2016 COURSE CATALOG
Complete Suite of Training and Competency Development

For a comprehensive portfolio of courses covering a broad spectrum of disciplines, visit NExTtraining.com
## Oil and Gas Training and Competency Development

### The NExT Edge

1. Full suite of training courses in upstream oil and gas industry disciplines as well as surface facility and midstream training for operators and technicians

2. Training on industry-leading software tools and software certification

3. Partnership with advanced industry and academic institutions to deliver best-in-class oil and gas technical and software training

4. A teaching faculty of more than 3,000 independent instructors, all experts in their fields, with a wide variety of technical and regional experience

5. Recognized as the 2013, 2014 and 2015 Getenergy Education/Training Provider of the Year, reinforcing NExT as the industry’s trusted partner for training and competency development

6. Access to a global network of Schlumberger training centers, where Schlumberger trains its customers as well as its own staff

**Winner: 2013, 2014 and 2015 Getenergy Education/Training Provider of the Year Award**
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### COMPETENCY MANAGEMENT

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E&P Introduction and Fundamentals

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked , and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
### E&P Introduction and Fundamentals

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Conducting an Integrated Reservoir Study

**Skill – 5 Days**

In this course, attendees conduct an integrated reservoir study for the purpose of optimizing a reservoir depletion plan or instituting EOR operations. Attendees will understand the data that are required and the workflow that should be followed to ensure a successful evaluation, in addition to learning techniques to characterize hydrocarbon reservoirs, build a static reservoir model, and import the static model into a reservoir simulator. Discussion includes procedures for integrated reservoir evaluation and how to improve production rates, ultimate recovery, and field economics by identifying potential for infill drilling, recognizing bypassed hydrocarbons, and improving EOR process efficiency.

**COURSE CONTENT**
- Objectives of integrated reservoir studies
- Flow scale considerations for data management
- Reservoir characterization and building blocks of the static model
- Seismic data and well logs
- Structural compartments
- Fractured reservoir in situ stress
- Fluid contact determination: Well logs, capillary pressure, and seismic attributes
- Reservoir heterogeneity
- Sedimentary facies analysis
- Flow and nonflow units
- Data integration and 3D property modeling
- Role of geostatistics in reservoir modeling
- Pressure-volume-temperature (PVT), capillary pressure, and volumetric reserves estimates
- Reservoir drive mechanisms and producing characteristics
- Conventional data analysis, pressure transient test, production data analysis, material balance analysis, and moving domain analysis
- Upscaling: interactive process involving geoscientists and engineers
- Initializing the reservoir model
- Integrated team approach for history matching
- Performance forecasting, reservoir optimization analysis, and parametric studies
- Economic modeling and optimizing the reservoir development plan

**AUDIENCE**
Geoscientists and petroleum engineers responsible for conducting comprehensive reservoir studies.

**PREREQUISITE**
Background in petroleum engineering or geosciences and experience in reservoir studies.

Introduction to Petrophysics

**Foundation – 5 Days**

In this course, attendees are introduced to petrophysical principles and techniques through hands-on physical experiments that illustrate the importance of basic reservoir properties: porosity, permeability, resistivity of oil and water, and capillary pressure. The course topics include petrophysical rock types in conventional and unconventional reservoirs, wireline logging, logging while drilling (LWD), pore geometry, core, and coring processes. The attendees will discover how conventional reservoir properties differ from unconventional reservoirs.

**COURSE CONTENT**
- Porosity: bulk volume, grain volume, and pore volume
- Permeability
- Pore geometry fundamentals and impacts in sandstone, limestone, and dolomite
- Wireline logging and LWD
- Core and coring operations
- Reservoir principles and mechanics
- Unconventional reservoirs

**AUDIENCE**
Geoscientists, engineers, and technicians who provide petrophysical technical support in need of an introductory understanding of petrophysical principles.

**PREREQUISITE**
None

Introduction to Production Engineering

**Foundation – 5 Days**

This course focuses on the basics of production engineering that attendees need to improve their asset team interactions. The attendees will learn about the role of production engineering in building capacity and maximizing production performance using tools including well testing, nodal analysis, and artificial lift. This engineering
overview covers the equipment and techniques that production engineers employ both downhole and on the surface.

**COURSE CONTENT**
- Overview of production engineering
- Reservoir fundamentals and nodal analysis
- Well testing
- Lower and upper completions, perforations, and sand control
- Completion fluids
- Multilaterals
- Well completion equipment
- Production logging
- Artificial lift
- Stimulation
- Surface facilities

**AUDIENCE**
Anyone wanting a better understanding of basic production processes and operations.

**PREREQUISITE**
None

**Fundamentals of Coal Seam Gas (CSG) Development**

**Foundation – 5 Days**
The 5-day course provides an introduction to CSG, ranging from a basic understanding of CSG exploration, appraisal, and development of the resource. Attendees will learn about the history of CSG and the technical and economic drivers, how to start the exploration process and the data needed, what is involved in the appraisal process, and the different varieties of CSG well design. The course also provides an overview of CSG development considerations, including planning, community engagement, development optimization, processing facilities, access to market, and environmental considerations.

**COURSE CONTENT**
- Introduction, history, and exploration objectives
- CSG exploration technologies and the exploration process, including rig selection, coring, sampling, description testing, and CSG logging and an exercise to demonstrate the importance of the Langmuir isotherm in determining recoverable reserves
- CSG appraisal, well design and stimulation
- Development considerations, including planning to execution, a development exercise, and reservoir engineering
- CSG development considerations, from facilities to sales, and a CSG quiz.

**AUDIENCE**
Technical and nontechnical, professional, business development, commercial, or government personnel with a need for a better understanding of coal seam gas development.

**PREREQUISITE**
None

**Introduction to Field Development Planning**

**Foundation – 5 Days**
This 5-day course covers the fundamental approach to working with and writing a field development plan (FDP), which is the output of a sequence of decision- and discipline-based tasks to create a development plan. It is the basis for a method of developing, producing, and maintaining hydrocarbon resources, including surface design, and it provides input for designing the associated surface facilities. The combined surface and subsurface documents form the basis for financial decisions. Attendees will be introduced to all these concepts as they are applied in the process of creating a development plan in relation to the reservoir life cycle.

**COURSE CONTENT**
- Introduction to the different phases of a reservoir life cycle, including the reason for and the need to create a field development plan to appropriately exploit the reservoir
- Introduction to different field development options for the reservoir
- Discussion of data integration and interdependence, including integration and timing of subsurface and surface decision making
- Discussion of the different interfaces and their relationships, data gathering, and need for reservoir monitoring
- In-depth discussion of various components of an FDP, highlighting the different tasks and activities that need to be done and reported
- Review of the concepts of FDP, including an introduction to opportunity framing workflow, road map, risk register, and stakeholder mapping.
Introduction to E&P Business Management with OilSim

Foundation – 5 Days

This 5-day course is designed to enhance knowledge and understanding of the entire oil company decision-making process, from initial new country entry strategy to field abandonment, and the typical business and economics framework of oil companies. It covers the technical and business challenges as well as the interactions with fiscal and government bodies. Relevant industry case studies and success stories will be reviewed throughout the course. Attendees will gain an understanding of asset management throughout the life cycle, which will be reinforced using oil and gas challenges practiced via computer simulation. They will learn how corporate strategy affects the management of upstream assets, how oil companies identify risks and use petroleum economics to develop successful exploration programs, the importance of reserves classification and the purpose of reservoir appraisal, and construction and project management.

In some locations, the course may run for 4 days.

COURSE CONTENT

- Macro-economics and corporate strategic responses
- Three tests of strategy
- Internal and external factors impacting the value of assets
- Fiscal regimes
- Simulated challenge: finding the sedimentary basins using geophysical techniques in a simulated challenge to find the best exploration blocks
- Petroleum systems
- Geophysical methods
- Exploration as a process and successful exploration strategies
- Petroleum economics
- Simulated challenge: Prospecting for oil and gas
- Reservoir appraisal
- Simulated challenge 3: Exploration and appraisal drilling
- Field development
- Simulated challenge: Depletion plan
- Facilities
- Simulated challenge 5: Facilities plan
- Construction and project management
- Simulated challenge: Construction project
- Production
- Simulated challenge: Production operations
- Maximizing value
- Abandonment

AUDIENCE

Individuals with a need for an increased understanding of the management of upstream oil and gas assets.

PREREQUISITE

Background, degree, or experience in the geosciences, engineering, or finance, accounting, etc. is preferred but not necessary.

Health, Safety, and Environment in Exploration and Production

Foundation – 3 Days

This course presents comprehensive HSE methods and tools used to develop risk management processes. Attendees will learn how to improve the safety of operating conditions at production facilities, minimize the risk in emergency situations, and establish proactive mitigation strategies.

COURSE CONTENT

- Risk management: Basic definitions, occupational health plan, risk recognition, unsafe act, and risk-generating source
- Risk evaluation objectives
- Risk magnitude determination
- Exposure results with clinical investigation relation
- Risk-control methods and their effectiveness
- Sampling strategy, plan, and methods
- Sample analysis: Direct-measurement tools and continuous sample analysis
- Risk control
- Risks at work administration
- Accidents: Causes, results, and occupational and disease management
- Hazard identification: Hazard operability analysis, qualitative methods for risk analysis, human error analysis, accident scenarios, natural threats, and preparation for emergencies
- Case identification and evaluation and emergency control

AUDIENCE

Engineers and HSE specialists interested in establishing systematic HSE procedures.

Introduction to Drilling

Awareness – 5 Days

If you work closely with drilling engineering, operations, or management, this course will increase your understanding of the concepts, terminology, and processes used in drilling a well. The course provides a complete overview of the workflow involved in the drilling of oil and gas wells, from office to wellsite. Attendees will also learn the roles and responsibilities involved in a drilling operation.

COURSE CONTENT

- Well construction and the role of drilling in the E&P life cycle
- Well design, including planning and engineering, and the data and analysis techniques needed to design a quality well
- Terminology and concepts used in the business of drilling, such as well timing, costs, risks, and AFE generation
- Drilling equipment explanation: Drilling rigs, bits, casing, and rig floor equipment
- Directional drilling and deviation control equipment and their operation, including unique characteristics of directional drilling
COURSE OFFERINGS

- Wellsite operations: Drilling, logging, casing, cementing, and completions
- Drilling kicks and well control, including well control equipment
- Real-time data collection, monitoring, and interpretation techniques used during drilling operations

COMPETENCY MANAGEMENT

- Principles Of Well Testing

AUDIENCE

- This three-day course is designed for geologists, geophysicists, petrophysicists working in exploration and exploitation.

PREREQUISITE

- A technical degree

Project Management for Team Members

AUDIENCE

- Entry-level professionals of all disciplines and nontechnical support staff.

COURSE CONTENT

- Cash flow basics
- Calculating revenue
- Estimating expenditures
- Fiscal systems
- Risk analysis
- Investment analysis
- Petroleum economics challenge (interactive exercise)

AUDIENCE

- Non-financial professionals of all levels from technical and non-technical backgrounds.

PREREQUISITE

- None

Reservoir Engineering for Non-Reservoir Engineers

AUDIENCE

- Anyone with a minimal background in project management or someone who desires an increased understanding of how to participate successfully in a project.

COURSE CONTENT

- Develop a high-level work plan, including project activities and effort estimates
- Explain why we apply project management best practices
- Define roles and responsibilities of project team members
- Identify project stakeholders and their contributions
- Identify the key components of the project life cycle and expectations of team members in each phase
- Define project stakeholders and their contributions
- Define roles and responsibilities of project team members
- Explain why we apply project management best practices
- Develop a high-level work plan, including project activities and effort estimates

AUDIENCE

- A technical degree

Oil and Gas Business Simulation with OilSim

AUDIENCE

- A technical degree

COURSE CONTENT

- Well Decline Curve Analysis
- Hydrocarbon reserves volumetric method
- Gas storage concepts
- Well Planning and Operations
- Formation testing
- Fluid statics and fluid distribution
- Reservoir drive mechanisms
- Oil and gas well performance
- Oil displacement concepts
- Reservoir Rock Properties
- Darcy’s Law and fundamentals of fluid flow
- Fluid statics and fluid distribution
- Reservoir drive mechanisms
- Oil and gas well performance
- Oil displacement concepts
- Hydrocarbon reserves volumetric method
- Well Decline Curve Analysis
- Material Balance Concepts

PREREQUISITE

- None
simulator instructor will guide attendees through the process.

**COURSE CONTENT**

Module challenges include:

- Initial screening to identify sedimentary basins using gravimetric and magnetic surveys
- Prospecting to find the best acreage, determine a bidding strategy, and win the bid using environmental surveys, regional geological maps, 2D seismic surveys, and topographic maps
- Exploration drilling to determine if the block contains oil and/or gas in commercial quantities, negotiate to share the risk, study 3D seismic surveys, assess environmental impact, contract drilling rigs and service providers, make a budget, and study the results from drilling
- Reservoir depletion plans using reservoir characteristics, nodal analysis, and production profiles
- Facilities plan to process and transport the oil and gas from the reservoirs using metrological surveys, production platforms, pipelines, and flowlines
- Construction project
- Production of the oil and gas for the lifetime of the asset

**AUDIENCE**

Individuals working in or around the oil and gas industry with a need for an overall understanding of upstream value chain.

**PREREQUISITE**

Background, degree, or experience in geosciences, engineering, or finance, accounting, etc. is preferred but not necessary.

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**Introduction to Petroleum Exploration and Production with OilSim**

**Awareness – 5 Days**

Level course is designed to expose the attendees to the full life cycle of the oil and gas industry. This course includes reservoir appraisal, development planning, execution, and finally production operations. Attendees will learn about the financial implications of these various phases and the role of professionals in each, as well as the functions of stakeholders.

**COURSE CONTENT**

- Exploration and geoscience overview
- Economic Petroleum Accumulation
- Reservoir prediction
- Exploration business processes
- Reservoir appraisal and development planning
- Reservoir engineering overview
- Reserve and recovery Estimation
- Well design process
- Well construction process
- Drilling economics and the AFE
- Production operations
- Well completion overview
- Completion equipment
- Specific completions
- Perforating overview
- Surface facilities and production transportation
- Challenge modules include exploration, field development planning, drilling, and completions.

**AUDIENCE**

New hires with geoscience or engineering degrees, technicians and operations professionals in each, as well as the functions of stakeholders.

**PREREQUISITE**

None

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**Petroleum Exploration and Production**

**Awareness – 4 Days**

In this course, attendees will be introduced to the different phases of an oil field’s life cycle: exploration, appraisal, well construction, field development, and production. The attendees will gain an overview of reservoir and field E&P through exercises, class discussions, team presentations, and interactive challenges. The course includes a review of relevant principles and consideration from a domain perspective of geology; geophysics; petrophysics; reservoir, drilling, completions, and production engineering; and production operations. Attendees will also learn about the financial implications of these various phases and the role of professionals in each, as well as the functions of stakeholders.

**COURSE CONTENT**

- E&P life cycle
- Functions of companies and personnel, and their roles and responsibilities
- Technologies, processes, and workflows for successful exploitation
- Political, environmental, and financial aspects of the oil and gas industry

**AUDIENCE**

Entry-level professionals of all disciplines and nontechnical support staff who want an introduction to E&P.

**PREREQUISITE**

None

**Online Exploration and Production**

**20-hour online course**

CBT course available covers the lifecycle of the reservoir, from to hydrocarbon formation to trapping in the reservoir to the exploration process. The course includes reservoir appraisal, development planning, execution, and finally production operations. It is an excellent introduction to the upstream petroleum industry.

**COURSE CONTENT**

- Exploration and geoscience overview
- Economic Petroleum Accumulation
- Reservoir prediction
- Exploration business processes
- Reservoir appraisal and development planning
- Reservoir engineering overview
- Reserve and recovery Estimation
- Well design process
- Well construction process
- Drilling economics and the AFE
- Production operations
- Well completion overview
- Completion equipment
- Specific completions
- Perforating overview
- Surface facilities and production transportation
- Challenge modules include exploration, field development planning, drilling, and completions.

**AUDIENCE**

New hires with geoscience or engineering degrees, technicians and operations professionals in each, as well as the functions of stakeholders.

**PREREQUISITE**

None

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supervisors, E&P financial, administrative, and legal personnel, midcareer managers new to the industry, senior administrative support personnel.

**PREREQUISITE**
None

**ProSource Front Office Fundamentals**

**Skill – 2 Days**

This course introduces attendees to ProSource delivery system Front Office, an easy-to-use web-based application that provides workflow-based data delivery in two important methods. These methods efficiently deliver log data directly into the Petrel and Techlog platforms by means of plug-ins, allowing users to search and visualize exporting data from the ProSource delivery system through a lightweight web interface.

The ProSource Front Office package interfaces with ProSource Logs, Enterprise, and Seismic systems.

**COURSE CONTENT**

- Initiate the ProSource Front Office delivery system and navigate the interface
- Search for and browse well information, deviation surveys, markers, perforations, checkshot surveys, core intervals, vertical seismic profile (VSP) surveys, and seismic data
- Observe the interrelationship of ProSource Front Office delivery system software
- Use a variety of features in different windows, including map, log viewer, log pass viewer, extended binary coded decimal interchange code (EBDIC) header, and the visualization and rotation of 3D deviation graphics
- Export log data into standard formats, such as log ASCII standard, log information standard, and digital log information standard (LAS/ LIS/DLIS)
- Download well, VSP, and seismic data files and associated documents
- Transfer data to Petrel and Techlog platforms using the associated ProSource Front Office delivery system plug-in
- Log data and associated document data Submit log from ProSource delivery system Front Office software to ProSource Logs module
- Build end-user workflows

**Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course**

**Foundation – 3 Days**

Attendees in this course will explore the functionality of the Merak Peep (petroleum economic evaluation program) and decline analysis module. These software packages allow for navigating efficiently through the case document, editing existing data, and analyzing economic runs.

**COURSE CONTENT**

- Create, edit, and copy economic case documents
- Review essential economic inputs
- Create filters and user parameters to easily sort large data volumes
- Use batch processes to edit or report multiple cases simultaneously and calculate price sensitivity
- Create consolidations to value workovers and aggregate projects
- Use batch processes to edit or report multiple cases at once and calculate price sensitivity

**Merak Peep Decline Fundamentals**

- Maintain current in-house and vendor data to understand production levels
- Import and export production history
- Create groups and summary wells to better manage well data
- Forecast production rates and volumes
- Perform basic decline analysis rate/time curves and cumulative curves

**AUDIENCE**

Anyone needing to develop or improve their skill and understanding of project economics and decline curve analysis performed with the Merak Peep and Peep Decline modules.

**PREREQUISITE**

Petrel Fundamentals class, OG-SWO-SIS12520, or have a basic knowledge of the Petrel user interface.

**Petrel Exploration Geology: Petroleum Systems Modeling Fundamental**

**Foundation – 5 Days**

This course demonstrates how to build, simulate and refine a 1D petroleum system model from well data and geologic information in Petrel. The results from the 1D model along with interpreted seismic surfaces are used as inputs in PSQL to provide simple, but rapid scenario testing, allowing you to quickly evaluate simple petroleum systems at present day. Domain theory will be discussed as needed to support the class exercises.

**COURSE CONTENT**

- Basin Analysis (Theory)
- Geochemical Analysis (Theory)
- Temperature Modeling (PSM)
- Generation (PSM)
- Migration (PSM)
- The Petroleum Systems Concept
- Overview of each tool and process
- Input data and set up 1D petroleum systems model
- Simulate 1D petroleum systems model
- A review of basic 1D simulator features and calibration workflows
- Calibrate model using basic principles of temperature and maturity calibration
- Input data, create maps, and edit function curves
- Analyze results of the petroleum system
- Build and set up a full 3D petroleum system model
- Import and process maps and function curves
- A review of basic PetroMod 3D simulator features and calibration workflows
- Calibrate a PS3D model using temperature data
- Analyze outputs of simulated PS3D model

**AUDIENCE**

Geologists and geoscientists involved in exploration projects from basin to prospect level, Geologists and geoscientists working on appraisal projects where hydrocarbon types and properties are not adequately understood, E & P professionals seeking a better understanding of the principles of petroleum systems modeling.

**PREREQUISITE**

OG-SW0-SIS12520 or have a basic knowledge of the Petrel user interface.

**Foundation** – 5 Days

**Fundamentals Combined Course**

**Foundation** – 5 Days

This foundation course introduces attendees to the fundamentals of petroleum systems modeling and analysis. It covers the basics of petroleum systems, including hydrocarbon generation, migration, and maturation, as well as the tools and techniques used to analyze and interpret petroleum system data.

**COURSE CONTENT**

- Overview of petroleum systems and their components
- Hydrocarbon generation and migration
- Maturation and thermal history
- Seismic and well data integration
- Temperature and pressure modeling
- Geochemical analysis
- Petroleum systems database management

**AUDIENCE**

Anyone seeking a comprehensive introduction to petroleum systems modeling and analysis.

**PREREQUISITE**

Basic understanding of geology and petroleum system terminology.
<table>
<thead>
<tr>
<th>COURSE OFFERINGS</th>
<th>IMMERSIVE LEARNING PROGRAMS</th>
<th>COMPETENCY MANAGEMENT</th>
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<tbody>
<tr>
<td>PIPESIM Fundamentals</td>
<td>OFM Fundamentals Using Gas Operations Examples</td>
<td>Studio for Petrel Users</td>
</tr>
<tr>
<td><strong>Foundation – 2 Days</strong></td>
<td><strong>Foundation – 2 Days</strong></td>
<td><strong>Foundation – 1 Days</strong></td>
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</table>

**PIPESIM Fundamentals**

In this course, attendees explore the PIPESIM simulator software, which provides steady-state, multiphase flow simulation for oil and gas production systems. Individual PIPESIM simulator modules are used for a wide range of analyses, including well modeling, nodal analysis, field planning, artificial lift optimization, and pipeline and process facilities modeling. A major feature of PIPESIM simulator software is the system integration and openness that allows users to develop a Total Production System Model. The attendees will gain a general understanding of how PIPESIM simulator software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

**COURSE CONTENT**

- Analyze well performance
- Design of models for pipeline and process facilities
- Perform nodal analysis
- Develop black-oil and compositional fluid models
- Select multiphase flow correlations
- Design surface network models

**AUDIENCE**

Anyone wanting to learn steady-state, multiphase flow simulation for oil and gas production systems to analyze well performance, model pipelines and facilities, and perform nodal analysis using PIPESIM simulator software.

**PREREQUISITE**

None

**OFM Fundamentals Using Gas Operations Examples**

This course introduces attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared gas operations project. The flow of the course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks using the OFM software suite. The course covers each of the required tasks. In accomplishing the tasks, the attendees are exposed to the range of common features of the software application.

**COURSE CONTENT**

- Briefly walk through a fully functioning project
- Review project data and check for missing values
- Use filters to screen out unwanted entities for analysis
- Group project data at multiple levels
- Create calculated fields and calculated variables
- Create single- and multiple-well plots
- Create and format well and field summary reports
- Export reports and table data to other applications

**AUDIENCE**

Anyone responsible for setting up and maintaining a project using OFM software.

**PREREQUISITE**

None

**OFM Fundamentals Using Oil and Waterflood Production Examples**

This course introduces the attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared oil and waterflood production project. The course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in the OFM software suite. The course covers each of the required tasks. In accomplishing these tasks the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a QA tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters.

**COURSE CONTENT**

- Briefly walk through a fully functioning project
- Review project data and check for missing values
- Use filters to screen out unwanted entities for analysis
- Group project data at multiple levels
- Create calculated fields and calculated variables
- Create single- and multiple-well plots
- Create and format well and field summary reports
- Export reports and table data to other applications

**AUDIENCE**

Anyone responsible for setting up and maintaining a project using OFM software.

**PREREQUISITE**

None

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Petrel Shale Fundamentals

Foundation – 3 Days

The course covers basic usage of the application, providing an understanding of how to get started with Petrel Shale Perspective tools. In addition, you will learn about Petrel interface, project setup, data import and visualization, Well section window, well correlation, seismic interpretation for horizons and faults, 1D petroleum system modeling, pad placements, pad well design tools, geosteering and plotting (general and production engineering).

COURSE CONTENT
- Introduction to Petrel
- Well data loading and data structure
- Well section
- Well tops use and interpretation
- Seismic interpretation
- Exploration tools
- Pad placement
- Pad well design
- Well design
- Geosteering
- Production engineering

AUDIENCE
Geophysicists, geologists, geochemists, and technical personnel not familiar with Petrel workflows and involved in shale oil and gas exploration and development.

PREREQUISITE
Knowledge on geosciences workflows

Techlog Fundamentals

Awareness – 5 Days

The Techlog platform interactive suite brings all of the petrophysical and geological data together. Attendees will learn the fundamentals of this application and its Techplot, Techdata, and Quanti base modules. In addition, the use of the data model within the Techlog application and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images, will be explained. The course topics include deterministic calculations and the principles behind the application workflow interface for single- and multwell use.

COURSE CONTENT
- Techlog platform interface and data structure
- Data management and QC techniques
- Multiwell management
- Basic plotting tools
- Workflows for deterministic evaluation using Quanti module
- User-defined programming language
- Advanced Techlog platform modules

AUDIENCE
Development and exploration log analysts and petrophysicists, geologists, petroleum engineers, managers, and technical personnel with no prior experience using the Techlog platform.

PREREQUISITE
None

Petrel User Experience

Awareness – 1 Days

This course is designed for users who have prior experience in Petrel but need to quickly transition to the new user interface. The course describes the new design elements that encompass the user interface and demonstrates its efficiency through workflow exercises.

COURSE CONTENT
- Design elements of the 2014 User experience
- Studio tools and usage with the new user interface
- Exploration Geology workflow: Petroleum systems 1D and 3D data access
- Geology workflow: Well correlation and 3D modeling
- Geophysics workflow: Seismic display and horizon interpretation
- Reservoir Engineering workflow: Create and run a simple simulation case
- Well Design workflow: Create well plans that intersect geological targets
- Well Deliverability workflow: Well completion design

AUDIENCE
Geophysicists, geologists, geochemists, Reservoir engineers and technical personnel already familiar with working in Petrel prior 2014
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<td>Structural Geology and Tectonics</td>
<td>Carbonate Stratigraphy and Sedimentology</td>
<td>Clastic Stratigraphy and Sedimentology</td>
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<td>Applied Structural Geology in Hydrocarbon Systems Analysis</td>
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<td>Fault Seal Analysis in Exploration and Development: Theory and Application</td>
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<td>Petrel Fracture Modeling</td>
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<td>Concepts and Applications of Sequence Stratigraphy to Petroleum Exploration and Production</td>
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<td>Sequence Stratigraphy: Principles and Applications</td>
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<td>Global Tectonics and Geological Prospecting Tools for Exploration</td>
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<td>Deepwater Sedimentary Systems: Exploration and Production</td>
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<td>Sedimentology and Depositional Environments of Deepwater Deposits</td>
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<td>Fluvial and Shallow Marine Reservoirs</td>
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**Geology**

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### Software

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<thead>
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<tbody>
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<td>Petroleum Systems and Exploration and Development Geochemistry</td>
<td>Evaluation and Management of Fractured Reservoirs</td>
</tr>
<tr>
<td>Exploration: Play and Prospect Definition</td>
<td>A Strategic Approach to Oil and Gas Exploration</td>
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<tr>
<td>Field Appraisal and Development</td>
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<tr>
<td>Petroleum Systems - Fundamentals and Applications</td>
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<td>Economics of Petroleum Exploration</td>
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<td>Applications of Borehole Imaging to Hydrocarbon Exploration &amp; Production</td>
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<td>Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources</td>
<td>Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources</td>
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<tr>
<td>Prospect Evaluation, Risks, and Volumes</td>
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<tr>
<td>GeoX Prospect Assessment Fundamentals (previously PACA)</td>
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<td>Operations and Wellsite Geology</td>
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<td>COMPETENCY LEVEL</td>
<td>Petrel</td>
<td>PetroMod Quantification of Uncertainty Analyses in Petroleum Systems Modeling</td>
<td>PetroMod Advanced Topics</td>
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<tr>
<td>ADVANCED</td>
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<td>SKILL</td>
<td>Petrel Well Design</td>
<td>PetroMod Applied Petroleum Systems Modeling Workflows (previously PetroMod Calibration Workflows for Petroleum Systems Models)</td>
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<td>Petrel Volume based modeling</td>
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<td>Petrel Property Modeling</td>
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<td>Petrel Introduction to Structural &amp; Fault Analysis Module (RDR)</td>
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<td>Petrel Workflow Editor and Uncertainty Analysis</td>
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<td>Petrel Velocity Modeling</td>
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<td>Petrel Exploration Geology: Petroleum Systems Modeling Fundamentals</td>
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<td>Techlog Thin Bed Analysis using the LowReP method</td>
<td>GeoX Advanced Prospect Assessment (previously Advanced Risk and Resource Assessment)</td>
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<td>Techlog Formation Evaluation with Quanti.Elan</td>
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<td>Techlog Processing and Interpretation of Quanta Geo Images</td>
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<td>Techlog Borehole Image Interpretation</td>
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<td>GeoX Reserve Tracker (previously Resource Management Concepts and Application)</td>
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<td>GeoX Full Cycle Value Assessment Concepts and Application</td>
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- **SOFTWARE**
- **INTEGRATED/BLENDED**
- **FIELD TRIPS**
- **VIRTUAL CLASSROOM**
- **DOMAINS**: Geology
  - **COMPETENCY LEVELS**:
    - **ADVANCED**
    - **SKILL**
    - **FOUNDATION**
    - **AWARENESS**

COURSE OFFERINGS  IMMERSIVE LEARNING PROGRAMS  COMPETENCY MANAGEMENT
# Geology

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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<td>Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel</td>
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<td>Mapping the Subsurface with Petrel</td>
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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
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#### COMPETENCY LEVEL

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- 3D structural modelling of rift-scale fault geometry and stratigraphy: a field, lecture and Petrel workshop - Petrel Structural and Fault Analysis module - Gulf of Corinthis, Greece

**Trap and Seal in Exploration and Development: Integrated theory, outcrop and software - Petrel Structural and Fault Analysis module - Moab, UT, USA**

- Depositional Environments from Slope Aprons to Tropical Reefs - Tabernas & Sorbas Basins, Spain

**Trap and Seal Risking in Exploration and Development - A field and lecture workshop - Moab, Utah**

- Late Palaeozoic to Early Mesozoic Sedimentation, SW Province, UK

**Oligo-Miocene carbonate sedimentary models of Malta: analogues for Cenozoic reservoirs worldwide**

- Foreland Basin Syntectonic Sedimentation - Southern Pyrenees, Spain

**Practical Fracture Analysis of Clastic Reservoirs with Petrel - Casper, Wyoming**

- Arid Coastline Carbonates and Evaporites of Abu Dhabi, UAE

**Characterisation and Petrel* 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky**

- Permian basin floor fan systems of Karoo, South Africa

**Introduction to Geology Including Pyrenees Field Trip**

**Introduction to Geology with OilSim and Pyrenees Fieldtrip**

#### Skill

**FROM FIELD TO SIMULATOR - An Applied Basin and Petroleum Systems Modelling Workshop**

- Reservoir-scale heterogeneity in Upper Miocene Platforms of the Balearic Islands.

- From Field to Simulator - An Applied Basin and Petroleum Systems Modeling Workshop

**Early Mesozoic Escarpment, Northern Denmark**

**Structural and Fault Analysis using Petrel - Integrated theory, outcrop and software - Northumberland, NE England**

**Trap and Seal Risking in Exploration and Development - A field and lecture workshop - Moab, Utah**

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#### Foundation

**Structural Geology for Petroleum Applications**

**Structural and Fault Analysis using Petrel - Integrated theory, outcrop and software - Northumberland, NE England**

**Trap and Seal Risking in Exploration and Development - A field and lecture workshop - Moab, Utah**

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**Introduction to Geology Including Pyrenees Field Trip**

**Introduction to Geology with OilSim and Pyrenees Fieldtrip**
Petroleum Systems and Exploration and Development Geochemistry

Advanced – 5 Days

The course is designed for exploration, production, and development geologists. Lectures show how geochemistry can reduce the risk associated with petroleum exploration, how to predict oil quality from inexpensive wellbore measurements, how to identify reservoir compartments and de-convolute commingled petroleum, and how to assess completion problems. It provides interpretive guidelines for sample collection and project initiation, how to evaluate prospective source rocks, and how to define petroleum systems through oil-oil and oil-source rock correlation.

COURSE CONTENT
- Objectives, Terms, Nomenclature
- Introduction to Basin and Petroleum System Models
- Origin and Preservation of Sedimentary Organic Matter
- Vitrinite Reflectance: Thermal Maturity, Calibration, Kinetics
- TOC, Rock-Eval Pyrolysis, Geochemical Logs
- Semivariograms and Spatial Significance of Data
- Biomarker Separation and Analysis
- Chemometrics for Correlation, Mixture Analysis
- Interpretive Pitfalls; Exercises
- Objectives, Terms, Nomenclature
- Migration and Compartments
- Migration Mechanisms: Diffusion, Solution, Gas-Phase, Oil-Phase
- Gas Chromatography, Stable Isotopes
- Oil Fingerprinting: Reservoir Compartments
- Leaky Casing, Production Allocation

AUDIENCE
Geoscientists needing knowledge of Petroleum Systems, Petroleum Geochemistry and Basin Modeling.

PREREQUISITE
Knowledge of Basic Petroleum Geology and Petroleum Systems

Applied Structural Geology in Hydrocarbon Systems Analysis

Advanced – 5 Days

This course provides participants with an understanding of rock deformation processes that is appropriate for planning exploration strategies and for developing better interpretations of existing data. It differs from other courses that are primarily descriptive by relating structural geology to a practical approach to geomechanics. The course emphasizes the role of structural geology in controlling fluid flows in the subsurface.

COURSE CONTENT
- Relevance of structural geology and rock mechanics
- Completion of cross section and structure contour map
- Seismic interpretation exercise
- Estimation of petrophysical properties of deformed rocks
- Simple stress states
- Group identification of geomechanical issues in selected examples Basin formation and geodynamics, reservoir depletion

Evaluation and Management of Fractured Reservoirs

Advanced – 5 Days

The course covers the elements needed in the evaluation of fractured petroleum reservoirs from both an exploration and development point of view. A general sequence of study will be presented as well as the data types needed to complete the study.

COURSE CONTENT
- Introduction to fractured reservoirs and their development consequences.
- General geomechanics and focus on fracture formation.
- Demonstration experiment of fracture formation.
- Fracture detection: borehole image tools.
- Fracture detection: seismic methods.
- Basement fractures and prediction of their location, orientation and depth.
- In-situ stress determination, relevance for field development planning.

Other courses and programs are also available, including Competency Management, Immersive Learning Programs, and more. Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Fault Seal Analysis in Exploration and Development: Theory and Application

Advanced – 5 Days

This course is designed to introduce concepts and methods in trap and seal analysis particularly as related to fault characterization including fault mapping and fault seal to geoscientists (geologists and geophysicists) and petroleum engineers so that they can apply these principles in their exploration and development projects.

COURSE CONTENT

• An introduction to fault seal and trap analysis.
• Methods and concepts on correctly characterizing faults and throw distributions.
• Review of fault rock types based on the undeformed host rock lithology.
• Basic principles of flow through porous media including permeability and threshold pressure.
• Discussion on estimating sealing capacity from the threshold pressure for a range of fault rock types.
• Triangle diagrams for estimating fault seal.
• Introduction to reservoir flow simulation and modeling fault flow resistance in development.
• Risking and uncertainty.
• Validation of methods and summary of course concepts.

AUDIENCE

The course is offered to geologists, geophysicists and petroleum engineers.

PREREQUISITE

None

A Strategic Approach to Oil and Gas Exploration

Advanced – 3 Days

This course focuses on understanding the use of strategic planning to optimize the probability of success in oil and gas exploration. The course includes recognizing the need for strategic change and developing options to respond to changing business environments, in addition to implementing new strategic directions and monitoring and reviewing performance.

The course builds on a number of case studies of strategic change and what can be learned from these scenarios. The course scope includes the technical, economic, and political drivers that shape the performance of all oil and gas organizations. The course will cover the importance of strategic planning at all stages of the exploration value chain (access through to basin selection and exploration play testing).

The attendees will gain an understanding of how to recognize the need for a strategic approach, how to develop a set of strategic options, and then how to select and implement the appropriate strategy for a given situation.

COURSE CONTENT

• Strategic change and organization life cycle
• Identify the key ingredients for winning strategies
• Exploration life cycle
• Exploration value chain
• Portfolio management – managing exposure
• Exploration process
• Delivering strategic change, organization, and performance
• People development
• Technology
• Monitoring and reviewing performance

AUDIENCE

Asset team members responsible for development of reservoir models that use geostatistical techniques.

PREREQUISITE

Basic understanding of geologic techniques and processes, structure and sedimentation; and static and dynamic reservoir modeling in addition to basic experience with the Petrel platform.

Geostatistical Reservoir Modeling: Standard Approaches & Best Practices

Advanced – 5 Days

In this modeling course that is designed for providing an understanding of integrated reservoir studies from outcrop to fluid flow simulator, attendees will learn practical requirements and workflows for modern 3D reservoir characterization. The course will employ deterministic and stochastic modeling to quantitatively integrate diverse data types, model reservoir heterogeneity, assess model uncertainty, and prepare the reservoir model as input to a flow simulator. Attendees will learn best practices for modeling and data integration using modeling software by participating in an informal, interactive discussion of the agenda topics, illustrated with case studies and demonstrations using the Petrel platform or equivalent software. In some course venues, work with the modeling software is by a hands-on method.

COURSE CONTENT

• Geostatistical reservoir modeling introduction
• Data quality control and data analysis
• Concepts of spatial analysis and modeling
• Computer workshop
• Kriging and collocated cokriging
• Stochastic simulation and risk analysis
• Reservoir heterogeneity preservation
• Structural modeling
• Flow simulator upscaling

AUDIENCE

Geoscientists and reservoir engineers who need to know how fractured reservoirs differ from conventional reservoirs and how to approach their study in a systematic manner will benefit from this course.

PREREQUISITE

None

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AUDIENCE

Asset team members responsible for development of reservoir models that use geostatistical techniques.

PREREQUISITE

Basic understanding of geologic techniques and processes, structure and sedimentation; and static and dynamic reservoir modeling in addition to basic experience with the Petrel platform.
Geological Assessment of Reservoir Seals and Pay

**Advanced – 3 Days**

In this course, basic petrographic, wireline, and capillary pressure data are used to evaluate reservoir rock quality, pay versus nonpay, expected fluid saturations, seal capacity, depth of reservoir fluid contacts, and transition zone thickness. Attendees will study the use of two-way capillary pressure analyses to approximate recovery efficiency during primary or secondary recovery. The attendees will also gain hands-on experience working with reservoir data in four practical workshop exercises.

**COURSE CONTENT**

- Reservoirs, seals, and pay evaluation
- Fundamentals and uses of capillary principles in reservoir evaluation
- Petrophysical and geochemical techniques integration to evaluate seal potential
- Basic principles of fault seal analysis
- Dynamic petroleum systems seal evaluation
- Pore geometry effects on relative permeability and capillary pressure
- Net pay determination methods
- Recovery efficiency, calculation of recoverable reserves, and evaluation of reservoir management options

**AUDIENCE**

Exploration and development geologists and reservoir engineers wanting to increase knowledge on principles governing hydrocarbon accumulations and their practical applications.

**PREREQUISITE**

Basic knowledge of geologic and reservoir fundamentals.

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Deepwater Petroleum Systems: Fundamentals and Applications

**Skill – 5 Days**

This course covers the fundamentals of petroleum system analysis (PSA) with an emphasis on deepwater applications. PSA, a relatively new specialization in the field of petroleum geology, is an investigation into in the generation of hydrocarbons in the subsurface and reconstructing the filling history of existing oil and gas accumulations, aiming to quantify the charge risk of undrilled prospects. Deepwater environments present the petroleum system analyst with a number of specific challenges because source rocks are typically beyond the reach of the drill bit and oil-to-source rock correlations are complicated by oil transformation processes such as remigration and biodegradation. Following a 3-day introduction to the PSA fundamentals, case histories from the Gulf of Mexico, offshore West Africa, and the Mediterranean are presented. Special attention is given to geochemical well evaluations, which form an essential part of PSA, not only in deepwater environments but also for the evaluation of unconventional hydrocarbons such as shale gas and basin center gas.

**COURSE CONTENT**

- Source rocks
- Burial, temperature, and maturity
- Petroleum geochemistry
- Deepwater well evaluations
- Applications

**AUDIENCE**

Geoscientists working in deepwater exploration and their direct supervisors, in addition to reservoir engineers, petrophysicists, and prospect portfolio analysts.

**PREREQUISITE**

Basic geology and chemistry understanding, but not essential.

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Deepwater Sedimentary Systems: Exploration and Production

**Skill – 3 Days**

Addressing the complexities of deep marine systems, this course teaches attendees how these facies evolved on the slope and in the open ocean, how they build into distinctive architectural elements, and how to recognize them. The course covers how to analyze and interpret seismic records, seafloor images, well logs (including borehole image logs), core materials, and outcrop characteristics of deepwater reservoir components with an emphasis on internal architecture as related to reservoir performance. Attendees will perform hands-on case studies of deepwater plays from around the world, illustrating characteristics unique to their exploration, appraisal, development, and reservoir management.

**COURSE CONTENT**

- Deepwater overview and building blocks
- Downslope, along-slope, and open-ocean systems
- Architectural elements: Nature and recognition
- Channel style and geometry
- Lobes, mounds, and sheets
- Deepwater massive sands
- Thin-beded turbidites
- Deepwater drilling, seismic sequence stratigraphy, and deepwater plays review
- Subsurface models

**AUDIENCE**

Geologists, geophysicists, and petroleum engineers involved in exploration and development of deepwater plays and project managers of deepwater plays and reservoir production.

**Deepwater Petroleum Systems: Fundamentals and Applications**

**Skill – 5 Days**

This 5-day course covers the theory and application of sedimentology and depositional environments of deepwater deposits. The course consists of an extensive series of topic-related modules in addition to workshops on attendee datasets.

**COURSE CONTENT**

- Lecture modules supported and complemented by a number of paper-based exercises mostly built around correlation problems
- Full set of lecture materials and exercises and the book “Petroleum Systems of Deepwater Settings” by P. Weimer and R.M. Slatt given to each attendee [subject to availability from the publishers and to timely advice by the client on the required number of copies]

**AUDIENCE**

Geologists.

**PREREQUISITE**

Reasonable knowledge of petroleum geology.
**Economics of Petroleum Exploration**

**Skill – 5 Days**

This course focuses on the business side of exploration; i.e., how does a company decide whether to move forward with a particular project? Attendees will learn how to structure and perform a discounted cash flow analysis and portfolio optimization process to identify the projects with the best economic potential.

**COURSE CONTENT**

- Business side of exploration
- Comparison of exploration projects under different fiscal regimes
- Role of project economics
- Calculation of cash flow and net present value (NPV)
- Worldwide fiscal regimes and their impact on exploration
- Probabilities, risk, and project risk assessment
- Fundamentals of decision analysis and decision trees
- Expected monetary value
- Value of information
- Comparative analysis of multiple projects
- Strategy and portfolio analysis

**AUDIENCE**

Exploration geoscientists and managers wanting to understand the economics of petroleum exploration.

**PREREQUISITE**

Basic petroleum geology and petroleum systems.

**Petrel Fracture Modeling**

**Skill – 2 Days**

This course covers the concepts of fracture modeling in relation to how it is used in Petrel and the oil industry in general. It focuses on which input data are available (like image log interpretations) and how they can be used in Petrel. Various processes will be used to view, quality check and manipulate the input fracture data (logs, stereonets, etc.)

**COURSE CONTENT**

- Fracture theory
- Point well data and Image log import and display
- Create tadpoles and rose diagrams
- Generation of fracture intensity logs and cumulative logs
- Fracture density maps
- Upscaling of well logs and 3D modeling of intensity
- Building stochastic Fracture models
- Fracture attribute generation
- Fracture theory
- Point well data and Image log import and display
- Create tadpoles and rose diagrams
- Generation of fracture intensity logs and cumulative logs
- Fracture density maps
- Upscaling of well logs and 3D modeling of intensity

**Petrel Exploration Geology: Integrated Evaluation of Petroleum Systems, Plays and Prospects**

**Skill – 3 Days**

This course will teach participants to use the Petrel Exploration Geology software suite of integrated petroleum system-based play to prospect exploration tools and workflows (Petroleum Systems Quick Look and Play to Prospect Risk). Participants will undertake play evaluation exercises that integrate all the elements of the petroleum system into a geologically-based, objective, consistent and documented results that can be used to understand and rank opportunities.

**COURSE CONTENT**

- Petroleum system and play definitions and concepts
- Introduction to the Petrel Exploration Geology tools
- Integrating petroleum system and play analysis
- Initial Screening of Concession Area
- Play Analysis and Lead Identification
- Lead Evaluation
- Prospect Evaluation and Ranking

**AUDIENCE**

Geoscientists familiar with prospect exploration fundamentals and workflows who want to learn to perform them using Petrel Exploration software.

**PREREQUISITE**

Petrel Fundamentals class experience.

**Applied Geostatistics**

**Skill – 5 days**

This course focuses on the application of the various geostatistics tools using both readily available and specialist software packages. These tools are now essential in most of the important aspects of E&P: gridding and contouring for maps, upscaling for reservoir simulation and basin modeling, and analysis of spatially referenced data of all kinds. The course emphasis is on practical applications and the understanding of context rather than on algorithm details and mathematics. Attendees will learn to choose the most appropriate geostatistics techniques and apply them correctly for E&P best practices, in addition to receiving a practical introduction to what is available in geostatistics software and take useful tools back to the workplace.

**COURSE CONTENT**

- Introduction to geostatistics and trends in spatial datasets
- Heterogeneity and discontinuity, data scale versus modeling scale, upscaling
- Spatial trends in gridding and contouring: Minimizing errors, kriging
- Bayesian and geostatistics, history matching, sequential and indicator simulation
- Uncertainty methods, Monte Carlo, and other stochastic simulations

**AUDIENCE**

Petroleum geologists and geoscientists preparing data for reservoir simulators and field models.
The basics of how play fairway mapping of the petroleum system elements is used to create play chance maps and assess play resources. The play level assessment of resources and play chance are then the basis for doing probabilistic volumetrics and determining the chance of success for the leads and prospects within the play. Attendees will learn how to do play evaluation that integrates all the elements of the petroleum system into geologically-based, objective, consistent, and documented results that can be used to understand and rank opportunities. They will evaluate a concession, from initial area screening to play evaluation and lead identification to the final assessment of the prospects developed from the leads.

**COURSE CONTENT**

- Petroleum system and play-to-prospect fundamentals: lecture and exercises, exploration terminology, organization, and objectives
- Global themes: what they are and how are they used in play identification
- Petroleum systems and petroleum systems modeling basics
- Lecture and exercises
- Play identification and evaluation: fairway mapping, chance mapping, and resource assessment
- Probabilistic volumetrics and prospect chance of success
- Concession analysis workshop
- Initial screening of concession area dry-hole analysis
- Quick evaluation of hydrocarbon generation potential
- Play analysis and lead identification
- Converting reservoir play fairway maps to play element chance maps
- Seal derivation of play fairway maps from seal facies and property maps using geological concepts and sparse data
- Using predefined and user-defined compaction trends to create seal capacity maps in the Petroleum Systems Quick Look module for the Petrel platform.
- Identifying leads
- Concession analysis workshop

**AUDIENCE**

Geoscientists with a need to learn prospect exploration fundamentals and how to perform workflows using Petrel software platform

**PREREQUISITE**

Petrel Software Fundamentals, OG-SW0-SIS12520.

**Practical Applied Geostatistics with Petrel**

**Skill – 5 Days**

This 5-day course covers the statistical and geostatistical tools available for understanding and quantifying uncertainty and the considerations required for use in reservoir characterization and model building. The Petrel E&P software platform will be used to investigate the complexities of uncertainty in geomodeling, enabling an understanding of the best way to use the advanced geostatistical features to construct geomodels. The course is designed to increase knowledge and understanding of uncertainty in geomodeling and provide a framework for optimum decision making.

**COURSE CONTENT**

- Uncertainty in data, how it arises, modeling and quantifying it, why geostatistics differ from statistics, how geostatistics describes uncertainty, separating the known from the unknown, and distinguishing between uncertainty and measurement
- Uncertainty in prediction, how variability affects measurement, variance within a single dataset, placing bounds on the unknown and using them to make better predictions and to quantify uncertainty in predictions
- Geomodeling, its role in modeling the predictable and unpredictable, the history
of geomodeling tools, and the search for balance
- Using large and complex datasets, multivariate analysis and log suites and seismic attributes
- Monte Carlo modeling and production statistics, how Monte Carlo methods work, finding the best inputs, optimizing simulations with data and time limitations, and Monte Carlo analysis

**AUDIENCE**
Geologists, petroleum engineers and geophysicists with a need to build models in Petrel software platform

**PREREQUISITE**
Introduction to Petrel platform training course and a basic understanding of statistics.

**Concepts and Applications of Sequence Stratigraphy to Petroleum Exploration and Production**

*Skill – 5 Days*

The course provides a template to enable communication between geologists, geophysicists, and engineers in the exploration, production and business milieus so they can use this discipline as a predictive tool for regional basin analysis, shelf to basin correlation and reservoir heterogeneity.

**COURSE CONTENT**
- Introduction to sequence stratigraphy: the critical stratigraphic surfaces used sequence stratigraphy with their relationship to the exercises briefly outlined.
- Basics: introduction to sequence stratigraphy with lecture describing the ideal ‘sequence’ of Vail et al 1977 and its associated terminology.
- Introduction to Seismic Sequence Analysis: the first steps that need to be taken to make a seismic stratigraphy interpretation and the definition and illustration of genetic reflection packages that envelope seismic sequences and systems tracts.
- Introduction to Sequence Stratigraphy of Hinge Zones - Book Cliffs, Utah: the first steps in the use of measured sections to build sequences stratigraphic models of hinge zones and continent to shelf transition.
- The Geologic setting of the La Pascua Formation - Guarico Sub-Basin Venezuela: general geological setting of the nearshore clastics of the Lower Oligocene La Pascua Formation of the Las Mercedes Field in the West Guarico Block, Venezuela, their lithology, relationship to sea level and plate tectonic setting.
- Introduction to Sequence Stratigraphy of Carbonates Sections - Book Cliffs, Utah: the first steps in the use of measured sections to build sequences stratigraphic models of carbonate platform and reef depositional systems, using measure sections from the Book Cliffs of Utah.
- Introduction to Sequence Stratigraphy of Carbonates Sections - Miocene Carbonates of Mallorca, Spain: the first steps in the use of measured sections to build sequences stratigraphic models of carbonate platform and reef depositional systems, using measure sections from the sea cliffs lining the south eastern shore of Mallorca.
- Select better quality in house examples that show good exploration potential and reservoir quality focusing on highlighting seismic quality and well logs in the interpretation.

**AUDIENCE**
The course is directed at geologists and energy professionals, including engineers who need a tool to predict permeability and porosity distribution, explorationists who wish to predict potential oil and/or gas distributions and geologists who wish to predict depositional lithofacies distribution and geometries.

**PREREQUISITE**
Degree in Geology or good practical understanding of Petroleum Geoscience.

**Applications of Borehole Imaging to Hydrocarbon Exploration and Production**

*Skill – 5 Days*

This 5-day course includes the principles and applications of borehole imaging with a strong emphasis on practical application to hydrocarbon exploration and production. The course covers the operating principles of the borehole imaging tools, dipmeter computation and interpretation, and application to structural geology, fracture characterization, and sedimentary environments. Several of the sessions are practical, with a range of examples and scenarios.

**COURSE CONTENT**
- Borehole imaging technology and tools
- Wellsite image quality control and image interpretation
- GPIT® general purpose inclinometry tool
- Dipmeter computation and interpretation principles
- Structural geology
- Schmidt stereonet basics
- Structural geology and fracture and fault characterization
- Stress analysis
- Integration of fracture data with sonic and dynamic data
- Palaeocurrent analysis
- Facies analysis and sequence stratigraphy

**AUDIENCE**
Geoscientists who wish to understand how to interpret borehole imaging data and use the data to complement other available information.

**PREREQUISITE**
Petroleum geology course or thorough understanding of geology.
COURSE OFFERINGS

Carbonate Sequence Stratigraphy and Application to Petroleum Reservoirs

Skill – 5 days

Through lectures and exercises, this course focuses on the impact of sedimentology, sequence stratigraphy, and diagenesis in E&P of carbonate reservoirs. Attendees will learn how carbonate reservoirs form and the unique attributes that affect interpretation techniques, including geometry, facies, and diagenetic alteration.

COURSE CONTENT

• Major controls on occurrence and nature of carbonate platforms, depositional environments, and facies
• Carbonate grain types and early lithification in subtropical lagoon, beach, and reef environments
• Carbonate sequence stratigraphy principles
• Miocene fault-block carbonate platform, stratigraphic geometries, facies associations, and depositional sequences
• Carbonate sequence stratigraphy and seismic stratigraphy applications to rimmed shelves and ramps
• Tectonic and basinal controls on carbonate platform types
• Near-surface diagenetic environments, processes, and products in carbonate rocks and their relation to sequence stratigraphy

AUDIENCE

Technical professionals involved in exploration for and development of carbonate reservoirs.

PREREQUISITE

Knowledge of basic geology.

Clastic Sedimentology for Exploration and Development

Skill – 5 Days

This course covers the fundamentals of clastic sedimentology at scales for both regional exploration and detailed reservoir characterization. Reviews of the main types of sedimentary basins are presented to the attendees in the context of crustal dynamics. Plate tectonics and the production and transport of clastic material descriptions are included for different tectonic, topographic, and climatic settings. Emphasis is on the practical interpretation of subsurface data—seismic, core, and wireline logs—for facies analysis and reservoir characterization. Examples draw from different facies, ages, and basinal settings. Particular attention is given to the principles by which depositional settings are interpreted using both outcrop and subsurface data and to the best correlation methods for different settings.

COURSE CONTENT

• Types of sedimentary basins in different tectonic contexts
• Large-scale tectonic settings of main types of sedimentary basins and relationship between structural style and fill patterns
• Effects of base-level changes and syndepositional tectonics on sediment distribution patterns
• Correlation in different sedimentary settings
• Role of analogs in building reservoir models in different depositional settings
• Sediment generation and supply in different settings
• Fluid dynamics and rheology of erosion, transport, and deposition
• Basic mechanics of sediment erosion, transport, and deposition; resultant bedforms and sedimentary structures

AUDIENCE

Geoscientists with a need to increase detailed knowledge of structural geology up to skill level

PREREQUISITE

Sound understanding of structural geology, not an entry-level course

Subsurface Facies Analysis: Integrating Borehole Images and Well Logs with Rock Physics and Seismic Data to Develop Geologic Models

Skill – 5 Days

This course presents an integrated approach to subsurface facies analysis by combining image and dip data interpretation with outcrop studies. The approach uses high-resolution seismic data to refine complete reservoir models. Attendees will learn the integrated approach from examples and case studies.

COURSE CONTENT

• Data acquisition, processing, and structural analysis
• Structural analysis using image and dip data
• Sedimentology and continental settings
• Eolian sediments
• Fluvial sediments and fluvial settings (various models)
• Deltaic, coastal, and shelf siliciclastic settings
• Deltaic, coastal, shelf, deepwater, and carbonate sediments

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Carbonate models and facies in coastal and shelf settings
• Fractured reservoirs and fracture systems
• Fractured reservoir case studies
• Geothermal systems in volcanic rocks

AUDIENCE
Geoscientists, engineers, and technical staff responsible for analysis and integration of image and dip data.

PREREQUISITE
Basic geology and reservoir modeling background.

Integrated 3D Reservoir Modeling Workshop

Skill – 5 Days

In this workshop, attendees learn a hands-on practical workflow for building a static reservoir model using the Petrel platform. Course topics include a solid presentation of the theory and methodologies behind 3D reservoir modeling with practical applications. Attendees will learn a step-wise approach to model building that starts with an overview of reservoir modeling, building of a structural framework, continuing with layering and gridding, and populating the model with reservoir properties. The attendees will gain valuable experience in use of volumetrics with uncertainties and basic geostatistics.

COURSE CONTENT
• Petrel platform software data import and export review
• Well correlations: Generate and edit well tops
• Structural modeling: Fault modeling, grid design, quality checking, zonation, and layering
• Statistics and data analysis review
• Basics of geostatistics and variogram analysis, introduction to kriging, and estimation techniques
• Deterministic and property modeling, including facies modeling
• Property data (petrophysics, seismic, and well-test data) integration
• Stochastic and conditional simulations
• Volumetric calculations exercise, with multiple realizations and ranking
• Design and properties upscaling

AUDIENCE
Geoscientists or engineers desiring a practical approach to building 3D reservoir models with Petrel platform software.

PREREQUISITE
Basic understanding of Petrel platform software.

Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel

Skill – 5 Days

This 5-day interactive and practical course will introduce the procedures and workflow for building a 3D model, teaching attendees about the use geological modeling to produce realistic volumetric estimations for hydrocarbon reservoirs. It will show how new operational data and revised interpretations can be identified and incorporated into models at any point in the workflow. Exercises will be done using the industry-standard Petrel* E&P software platform.

Relevant industry case studies and practical applications will be reviewed throughout the course. Attendees will gain an understanding of the key challenges associated with building effective 3D reservoir models, from interpretation and design to quality assurance and optimization of results.

They will also gain an understanding of the science and workflows behind building consistent 3D reservoir models, including fluid distribution, permeability, compartments, and volumetric estimation and learn how to integrate data from cores and logs and how to upscale the data into geological and flow simulation models that will have a high impact on field development and production scenarios.

COURSE CONTENT
• Conceptual design and workflow
• Reservoir envelope: top and base structure
• Internal framework: correlation scheme
• Reservoir compartments: fault geometry
• Reservoir architecture: facies model
• Petrophysical property distribution
• Volumetric assessment
• Reservoir framework
• Depth conversion uncertainty
• Model surface selection and quality control
• Fault modeling and compartments
• Stratigraphy and correlation
• Grid construction
• Reservoir architecture
• Depositional models and facies analysis
• Core log integration
• Basic statistics
• Objects and indicators
• Seismic conditioning
• Facies modeling
• Property modeling in 3D
• Basic petrophysics
• Rock typing
• More basic statistics
• Porosity models
• Saturation models
• Permeability models
• Uncertainty and Upscaling
• Geological model analysis
• Hydrocarbon volumes initially in place
• Drainable volumes
• Simulation grid construction
• Property upscaling
• Multiple scenarios, realizations, and ranking

AUDIENCE
Geologists, geophysicists, petrophysicists, reservoir engineers, drilling engineers, and seismic interpreters

PREREQUISITES
Basic knowledge of Petrel E&P software platform and a basic understanding of the principles of geology and log analysis.
Mapping the Subsurface with Petrel
Skill – 5 Days

This course will take the attendee through the primary techniques for constructing two-dimensional (2D) maps and sections of the subsurface, including the integration of well data and key surfaces defining the framework of geologic units in the subsurface as the foundation of subsurface evaluation. These initial 2D techniques allow the interpreter to display the 3D relationships of geologic surfaces and any associated faults, which are key to defining the spatial and volumetric aspects of the associated subsurface resource. The geologic surface and fault relationships analyzed in this course will also be linked to the overall aspects of depositional settings and structural styles that are present within global development of geologic terrains.

COURSE CONTENT
• Course objectives, history and principles of surface mapping across structural styles
• Wellbore correlation of vertical and directional drilling data to subsurface feature mapping
• Applications of fault and surface mapping techniques to structural styles: strike-slip, growth, compressional, and thrust
• Petrel platform mapping introduction – volumetric calculation from surface mapping
• Computer contouring techniques

AUDIENCE
Geologists, petroleum engineers, and geophysicists involved with the development of oil and gas reservoirs and needing knowledge of correlation and structural/stratigraphic mapping techniques.

PREREQUISITE
A fundamental understanding of geologic concepts. The Petrel platform software will be used in the course. Although it is strongly suggested that attendees have taken the Introduction to Petrel course, it is not required.

Deepwater Reservoirs
Foundation – 5 Days

This in-depth course provides the process sedimentology background required to understand deepwater systems and to recognize sediment gravity flows on subsurface datasets. Course participants will be able to:
• Differentiate between mass transport complexes, sediment gravity flows, and contours and predict net-gross values for each in seismic data
• Differentiate between channels, lobes, mass transport complexes, and contoured deposits on well logs
• Identify processes responsible for sedimentary structures, bedforms, and lithology and use these to determine depositional environments and lateral continuity of reservoirs from core samples
• Correlate reservoir sandstones using concepts developed by Mike Gardner in the Brushy Canyon formation of the southwestern U.S. The course also builds on several outcrop analogs, including the Ross formation of Ireland

COURSE CONTENT
• Company-specific case studies
• Course manuals, including seismic data, well logs, core photos, and other handouts

AUDIENCE
Geoscientists who wish to understand deepwater reservoirs.

PREREQUISITE
Basic knowledge and understanding of geology.

Fractured Reservoir Characterization with Emphasis on Carbonates
Foundation – 3 Days

This 3-day course, covering essential geology and geomechanics of fractured reservoirs, extends from appraisal through development to secondary recovery. It also introduces the basics of reservoir engineering issues. The course contents are general to all types of fractured reservoirs with an emphasis on carbonates. Classroom sessions include exercises that provide for open discussion of the specific issues or datasets submitted by the attendees. A comprehensive reference list of technical sources is provided in addition to a slide set used during the course.

COURSE CONTENT
• Fractured reservoir types and introduction of the key issues
• Tools and techniques available for fractured reservoir characterization workflows
• Basic structural geology and rock mechanics, emphasizing their relevance to reservoir descriptions in the geology and geophysics environment
• Various approaches to fracture modeling, fractured reservoir characterization principles, and workflows
• Discuss specific issues relevant to real-world reservoir characterization

AUDIENCE
Geologists, geophysicists, petrophysicists, and reservoir engineers looking to develop their skills in the fractured reservoir characterization workflows.

PREREQUISITE
Basic background in geology.

Deepwater Reservoirs
Foundation – 5 Days

This in-depth course provides the process sedimentology background required to understand deepwater systems and to recognize sediment gravity flows on subsurface datasets. Course participants will be able to:
• Differentiate between mass transport complexes, sediment gravity flows, and contours and predict net-gross values for each in seismic data
• Differentiate between channels, lobes, mass transport complexes, and contoured deposits on well logs
• Identify processes responsible for sedimentary structures, bedforms, and lithology and use these to determine depositional environments and lateral continuity of reservoirs from core samples
• Correlate reservoir sandstones using concepts developed by Mike Gardner in the Brushy Canyon formation of the southwestern U.S. The course also builds on several outcrop analogs, including the Ross formation of Ireland

COURSE CONTENT
• Company-specific case studies
• Course manuals, including seismic data, well logs, core photos, and other handouts

AUDIENCE
Geoscientists who wish to understand deepwater reservoirs.

PREREQUISITE
Basic knowledge and understanding of geology.

Satellite Data Processing and Interpretation
Foundation – 5 Days

This 5-day course covers the theory behind satellite data acquisition, processing and archiving of optical and microwave satellite imagery, and geological concepts for use with satellite imagery, focusing on geological case studies and integration of satellite imagery data with other geoscience data and culminating in satellite imagery-based exploration concepts. Attendees will gain knowledge and understanding of satellite data processing and interpretation in the hydrocarbon industry with applications for exploration, geophysical data acquisition, and infrastructure planning. They will learn what satellite imagery can and cannot deliver, which satellite imagery to use and when, and how to integrate it into the exploration, development, and production workflows.

COURSE CONTENT
• Theoretical background: electromagnetic spectrum and wave propagation, atmospheric impact on satellite image data and corrections, imaging satellites, raw satellite data to the satellite image and digital elevation model, satellite image processing
• Geological concepts: deposition and erosion, faulting and folding, geomorphology, hydrology, and geological mapping
• Mapping from satellite imagery: tomography mapping, surface spectral mapping for land use, time lapse optical mapping, surface and nearsurface microwave radar analysis using the partial penetration of microwaves into the ground for structural and sedimentological mapping
• Satellite data interpretation: embedding local prospect oriented satellite data interpretation into regional basin trends, satellite geomorphology, folds and fold belts, faults and fault systems, water courses and faults, geological mapping, geologic outcrop analogs for subsurface geological settings
• Integration with other geosciences: seismic survey planning, infrastructure planning, hydrocarbon mapping, ground subsidence from microwave radar, prospect-scale geological joint interpretation of satellite imagery and shallow seismic data, gravity from microwave radar data

PREREQUISITE
Basic background in geology.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Combining all geological concepts, satellite data processing and interpretation, and other nonsatellite geoscientific data efficiently

AUDIENCE

Individuals with a need for increased understanding of satellite imagery and its use for the exploration, development and production of hydrocarbon fields

PREREQUISITE

Background, degree or experience in the geosciences or engineering is preferred

Development Geology

Foundation – 5 Days

This course provides attendees with the fundamental skills to construct geologic models and understand the factors that affect field operations and field management. The course covers from the gathering and interpretation of geologic data to the preparation of geologic models to the quantification of subsurface uncertainty, in addition to applying geologic concepts, constructing maps and sections, and validating computer-generated interpretations. Also included are calculating subsurface volumes and assessing their uncertainties, preparing a well proposal, planning appraisal wells, and assessing their economic value. Attendees will acquire practical experience by working in teams on an actual field study.

COURSE CONTENT

• Scope of oil and gas business
• Subsurface models, input data, and modeling concepts
• Gathering, processing, and interpreting seismic data
• Structural types, traps, fault seals, maps and sections, and correlations
• Clastic sedimentary environments
• Basic well technology, horizontal wells, well data, log and core data, uncertainties, and mapping
• Carbonate reservoirs
• Subsurface development options
• Volumetrics and subsurface uncertainties
• Static and dynamic models
• Field operations, well design, and geologic input
• Development options, project planning, and phased costs
• Impact of subsurface uncertainty on project economics

AUDIENCE

Engineers and geologists involved in reservoir appraisal and development projects.

PREREQUISITE

Basic petroleum geology, and knowledge of petroleum systems.

Carbonates in the Petroleum Industry

Foundation – 5 Days

The course is classroom-based comprising mainly lectures interspersed with videos and exercises. Participants will learn how to classify carbonates in terms of their depositional textures, fabrics, diagenesis, petrophysical characteristics and source potentials. Carbonates deposited in a range of depositional settings are discussed – both modern and ancient with extensive use of outcrop examples.

• Introduction and agenda
• Carbonate minerals, grain types and classifications
• Carbonate analytical techniques
• Lacustrine carbonates
• Carbonate platforms
• Grainstone environments
• Aeolian activity in an arid environment
• Evaporites
• Microbial mats and algae
• Diagenesis
• Karstification case studies
• 3D static modelling
• Sequence stratigraphy
• Lower Carboniferous carbonates of the UK
• The Golden Lane plays, Mexico
• Miocene carbonates of the Sorbas and Nijar Basins, Southern Spain
• Oligo-Miocene carbonates of Majorca
• Aspects of Miocene carbonates of Sardinia
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

AUDIENCE

Geologists, geophysicists, petroleum and reservoir engineers, drillers

PREREQUISITE

Participants should have had at least an introductory course on geoscience

Geology of Clastic Reservoirs

Foundation – 5 Days

This course offers an in-depth analysis of the distributions, geometries and sedimentary architectures of clastic reservoir facies. Participants will learn the criteria for distinguishing reservoir facies using wireline log and core data, how to interpret facies distributions at regional and field scales, and how to integrate this information into exploration and development projects.

COURSE CONTENT

• Continental clastic reservoir
• Introduction of facies analysis.
• Transitional clastic reservoir
• Shelf & deep-water clastic reservoir
• Characteristics of clastic reservoirs
• Basic clastic reservoir characteristics.
• Effect of diagenesis on reservoir quality.
• Reservoir continuity, heterogeneity and reserve calculation.
• Methods of explorations (seismic interpretation, wire-line logs, structural and isopach
• Sequence stratigraphy: general concepts.
• An overview on sequence stratigraphy in clastic depositional systems.
• Exercises.

AUDIENCE

Geologists, geophysicists, reservoir engineers, reservoir simulation engineers

PREREQUISITE

Basic knowledge of sedimentary geology

Fundamentals of Structural Geology

Foundation – 5 Days

This 5-day introductory course will introduce attendees to the main elements of geomechanics as a basis for understanding structural geometries and kinematics. Attendees are encouraged to bring actual cases of their current work for general discussion and integrated, hands-on problem solving during the workshop. Basic interpretation and mapping techniques will be covered for each tectonic regime, and case studies will be used to enhance understanding of the mechanics.

The schedule is tentative and flexible because interaction and discussion are the main priorities.

COURSE CONTENT

• The dynamic petroleum system concept
• Introduction to 1D, 2D, and 3D basin and petroleum system modeling
• Petroleum system folio sheet

Fundamentals of Model Input

• Timing of petroleum system events and processes
• Alaska North Slope 3D model
• Fundamentals of Model Input
• Thermal maturation and vitrinite reflectance
• Total organic compound (TOC), rock-evaluation pyrolysis, geochemical logs
• Fractional conversion, original TOC, expelled petroleum, expulsion efficiency
• Boundary Conditions and Geohistory Analysis
• Boundary conditions: paleowater depth, sediment-water interface temperature, heat flow
• Geohistory analysis: pore pressure, compaction, tectonics
• Fundamentals of kinetics and model calibration
• Chemical reaction kinetics
• Model calibration and risk analysis
• PVT analysis
• Unconventional reservoirs, case studies, and conclusions
• Modeling unconventional resources
• Case studies
• Review and conclusions
• Practical exam

AUDIENCE

Exploration, production, and development geologists

PREREQUISITE

Basic knowledge of chemistry and geology

Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources

Foundation – 5 Days

This 5-day course will focus on reducing exploration risk in unconventional plays using geochemistry and petroleum system modeling. Lectures will enhance the attendees’ understanding of how forward deterministic computer models use geohistory analysis, boundary conditions, and chemical reaction kinetics to predict the timing of petroleum generation, molecular composition, and extent of overpressure. Discussions will provide guidelines for sample collection and project initiation, how to evaluate prospective source rocks, and how to define petroleum systems through oil-source rock correlation. Attendees will learn how to calibrate petroleum system models using data from wells such as pressure, corrected bottomhole temperature, and vitrinite reflectance. Lectures and discussions will focus on identifying pitfalls to correct interpretations. Case studies and exercises will show how geochemistry can be used to solve exploration, production, and development problems while minimizing costs.

COURSE CONTENT

• Introduction: to geomechanics
• General fault characteristics
• Extensional tectonics: rifts, deltas, domes
• Strike-slip tectonics
• Compressional tectonics: fold-and-thrust belts
• Compressional tectonics: fault reactivation, multiphase tectonics
• Impact of faults and fractures on hydrocarbon entrapment and fluid flow
• Fault sealing mechanisms and approaches to evaluate seal integrity in E&P scenarios
• Fracture systems: fracture mechanics, reservoir examples, and outcrop examples
• Analysis of fault and fracture systems, including fractal properties of fault and fractures and prediction of subseismic faults
• Discussion of fracture mechanics, fracture types, natural fracture systems, and...
their influence on reservoir characteristics and production strategies
- Identification of faults and fractures (natural and coring induced) in cores and
- Subsurface pressures

**AUDIENCE**

Geologists and oil and gas professionals with a need for enhanced understanding of structure

**PREREQUISITE**

Basic knowledge of petroleum geology

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**Introduction to Biostratigraphy**

**Foundation – 3 Days**

Structured to provide basic, practical knowledge, this course covers the main fossil groups used in geologic operations, sample processing techniques, marker identification, and use of biostratigraphic charts in the geologic interpretation of drilling sections. Biostratigraphic information is a tool routinely used in many operations, and this introductory course covers its fundamental E&P applications and limitations. Attendees will better understand the most common mistakes made while studying samples and interpreting the fossil assemblages, in addition to correctly assessing the stratigraphic level during drilling and interpret the paleontological associations.

**COURSE CONTENT**

- Biostratigraphy definitions and principles
- Foraminifera, calcareous nanoplankton, and, palynomorphs
- Biostratigraphical studies while drilling
- Sample processing, picking, and identifying of fossil groups
- Biostratigraphic studies and fossil groups according to geologic section
- Design sampling strategy while drilling (exercise)
- Index and facies fossils
- Paleoenvironment assemblages and biofacies
- Principles of absolute and relative datation
- Time scale and biostratigraphic zonations
- Age interpretation based on fossils
- Use of lithostratigraphy, biostratigraphy, chronostratigraphy, and discontinuity-bounded stratigraphical units
- Key biostratigraphic events in Earth’s history
- Transgressive-regressive cycles, sequences, and interpretation
- Key sequence stratigraphy surfaces
- High-resolution biostratigraphy

**AUDIENCE**

Geoscientists, geophysicists, petroleum engineers, drilling engineers, and other professionals working in E&P operations.

**PREREQUISITE**

Basic knowledge of petroleum geology.

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**Prospect Evaluation, Risks and Volumes**

**Foundation – 5 Days**

Risk and volume assessments form the basis for decisions on whether to drill or not drill a well, and as such, form the link between subsurface evaluation and the business aspects of the petroleum industry. This course explains how risks and volumes can be assessed in a realistic manner based on a sound understanding of the geological details of the prospect as well as of its regional geological setting, and current play understanding.

At the conclusion of the course, the participants will have an excellent understanding of the essentials required for realistic risk and volume assessments of exploration prospects. The course allows participants to produce well-considered and realistic assessments for prospects in which they may be involved, and to understand and constructively challenge risk and volume assessments of colleagues and/or partners/competitors.

**COURSE CONTENT**

- Risk and volumes assessment fundamentals
- Risk and uncertainty difference
- Statistics fundamentals, including distribution curves, expectation curves, adding and not adding risk volumes, and Bayes theorem
- Trap, reservoir, seal, and charge uncertainties
- Estimating risks realistically and consistently
- Calculating volume ranges for prospects and portfolios of prospects; how to add prospect volumes for a correct representation of prospect portfolios
- Incorporating geophysical evidence (direct hydrocarbon indicators [DHIs]) in a realistic risk assessment

**AUDIENCE**

Geoscientists working in exploration, prospect portfolio analysts and their direct supervisors, and staffs from disciplines working closely with reservoir engineers, petrophysicists, and geophysicists.

**PREREQUISITE**

Knowledge of basic petroleum geology as related to exploration. A knowledge of basic petroleum economics is helpful but not required.

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**Fluvial and Shallow Marine Reservoirs**

**Foundation – 5 Days**

The course is designed for geoscientists and reservoir engineers who primarily focus on ‘shallow marine’ successions. Whether your task involves a simple well-correlation across tidal systems, or the input of fluvial channel dimensions into a geomodel this course will benefit you in several ways.

**COURSE CONTENT**

- Classification of rivers, architectural elements, prolific global fluvial reservoirs
- Exercise on calculating channel dimensions and geometry using core or borehole image log data.
- Wave, Tidal, Fluvial processes
- Deltas through sea-level cycles, architecture, fan-deltas, gilbert-type deltas, shelf-margin deltas and supply of sand into the basin
- Distribution of reservoirs and their vertical stacking patterns
- Exercise focuses on describing shallow marine core.
- How to differentiate between each?
- Effects of stacking patterns on Kv and Kh, N:G changes
- Exercise on well correlation.
- Exercise focuses on the recognition of these environments on seismic.

**AUDIENCE**

Geoscientists and reservoir engineers who primarily focus on ‘shallow marine’ successions

**PREREQUISITE**

Basic understanding of Geology.
## Basin Analysis and Petroleum Systems Modeling

### Foundation – 5 Days

This 5-day course covers the key aspects of basin analysis and subsequent basin and petroleum systems modeling from input to output. The course contents include basin evolution from plate tectonics to petroleum generation and migration. Risks and uncertainties that influence understanding petroleum systems within a basin and how to quantify those uncertainties are included. This course provides the basic geoscience background needed by anyone engaged in petroleum systems modeling. Attendees will learn the type of questions to ask, the kind of data needed to build models and solve specific problems, and how to apply geological reasoning in quantifying uncertainties.

### COURSE CONTENT

- Introduction to sedimentary basins
- Basin forming mechanisms
- Basin classification and structural analysis
- Basin fill
- Geochemical analysis
- Temperatures and pressures in sedimentary basins
- Petroleum system modeling
- Petroleum systems modeling approach
- Hydrocarbon generation
- Hydrocarbon migration
- Uncertainty management and quantification

### AUDIENCE

Geoscientists involved in petroleum systems modeling or anyone wanting to know more about the petroleum systems modeling approach.

### PREREQUISITE

Basic knowledge of geology and no prior petroleum systems modeling experience.

## Operations and Wellsite Geology

### Foundation – 5 Days

In this thorough overview of wellsite data acquisition and quality control, attendees will learn the formation evaluation techniques used by wellsite geologists. A combination of lectures and practical exercises enhance the understanding of drilling problems caused by subsurface conditions and the application of wellsite data in exploration and development projects.

### COURSE CONTENT

- Petroleum geology, depositional environments, and stratigraphy
- Drilling operations, problems, and well control
- Logging operations: Petrophysics, acquisition, fundamentals, and tools
- Operations geology: Duties, responsibilities, and well-planning processes
- Wellsite geology and mud logging services
- Hydrocarbon detection (data acquisition) and sidewall and conventional coring (acquisition and coring of poorly consolidated rocks)
- Lithological and composite well logs
- Wellsite contracting: Drilling, mud logging, wireline services, coring, and quality control
- Cuttings: Descriptions, abbreviations, lithologies, and log correlations

### AUDIENCE

Geologists participating in well drilling or wellsite operations.

### PREREQUISITE

Basic understanding of geology.

## GeoX Prospect Assessment Concepts and Applications (PACA)

### Foundation – 5 Days

This 3-day course combines lectures, exercises using manual calculations, and exercises using GeoX software to illustrate assessment concepts and their applications. It is designed to provide participants with an overview of the concepts of prospect assessment and prepare them to assess both simple and complex prospects using the GeoX software.

### COURSE CONTENT

- Segments: segment definition, segment volumetrics, volumetric uncertainty, segment risking
- Multiple segment prospects: independent segments, risk dependencies, correlations between segments, fluid communication

### AUDIENCE

Geologists, geophysicists, and reservoir engineers involved with prospect assessment

### PREREQUISITE

None although working knowledge of basic subsurface geomodels and exploration workflows is helpful.

## Petrel Geology

### Foundation – 3 Days

The Petrel platform Geology course consists of two workflows for volumetric calculation; a map-based and a 3D model workflow.

The map-based workflow focuses on the creation of surfaces that delineate the target reservoir. These surfaces, in combination with properties in the form of gridded surfaces or constants, are used to calculate volumes. The 3D model-based workflow focuses on the construction of a 3D grid, populating the grid with properties to be used in determining an accurate volume calculation.

### COURSE CONTENT

- Surface generation and refinement
- Well interpretation and visualization
- Isochore processing
- Map-based volume calculations
- Structural framework
- Geometrical modeling
- Upscaling well logs
- Facies modeling
- Petrophysical modeling
- Contacts creating
- Volume calculations

### AUDIENCE

Geoscientists, geophysicists, and engineers working on static and dynamic modeling.
Introduce to Subsurface Mapping

Foundation – 5 Days

This 5-day course combines lectures, exercises using manual calculations, as part of a subsurface evaluation team the geophysicists and geologists interpret subsurface data and provide geological models that form the basis for development planning. Construction of maps and sections of the subsurface, including integration of seismic and well data, forms an important part of the evaluation.

COURSE CONTENT

- Hydrocarbon basins/plays
- Plate tectonics, structural regimes
- Sedimentary cycles and sequences
- Sedimentary environments overview
- Origin of hydrocarbons, source-rocks and maturity
- Hydrocarbon traps, spill-points
- Seismic data gathering, processing and interpretation
- Reservoir properties, data gathering and mapping
- Structural styles, stresses and pressures
- Three exercises: structural interpretation of seismic, Nigeria, France and the North Sea
- Volumetric calculations, subsurface uncertainties
- Faults, fault constructions and fault sealing
- Lacustrine basins, field examples.
- Course review and round-up

AUDIENCE

Geoscientists and petroleum engineers involved with the development of oil and gas reservoirs.

PREREQUISITE

Petrel Fundamentals course or similar Petrel platform experience coupled with a general knowledge of petroleum geology and geophysics, as well as elemental software skills.
AUDIENCE
Entry level to mid-level engineers, geoscientists, and other E&P staff with a need to understand the role geology plays in their everyday business activities

PREREQUISITE
None

Petrel Advanced Property Modeling

Advanced – 2 Days

which in recent years has become the standard for guiding and constraining petrophysical models. Pixel-based and object models are demonstrated, in addition to complex hierarchical models combining multiple methods. Standard facies modeling methods have their limitations in more complex depositional environments; therefore, this course will explore the more advanced property modeling tools such as the cutting-edge multipoint statistics (MPS) process. Different methods for creating soft probability data using various processes to analyze data, such as trend modeling and geometrical trend modeling, and exploring the relationship of secondary data to constrain models, will also be covered in this course. There is a special focus on the theory supporting the multipoint statistical concept, covering the creation of good training images and how to incorporate soft probability data, vary direction, and scale in the final simulation model. In addition, this course covers the Geobody modeling tool for extracting seismic bodies and use them directly as “hard data” in the modeling process. Also, Gaussian Random Function Simulation (GRFS) and Sequential Gaussian Simulation (SGS) petrophysical models constrained to the previously generated facies models will be shown. Using automated property modeling workflows to update models in a simple and rapid way will be briefly covered.

COURSE CONTENT
- Overview of basic geostatistics
- Creating soft probability data
- Facies modeling methods with classical geostatistics
- Pixel-based and object-based facies modeling methods
- Conditioning and combining modeling methods
- Neural Network Learning Systems
- Multipoint statistics theory
- Region properties
- Conditioning and scaling of MPS models
- Creating and using seismic geobodies
- Multipoint facies simulation
- Conditioned petrophysical modeling (optional)

AUDIENCE
Development and exploration geologists, geophysicists, petroleum engineers, reservoir engineers and technical personnel with experience in Petrel Property modeling.

PREREQUISITE
Petrel Fundamentals and Petrel Property Modeling courses or equivalent Petrel experience, in addition to a general knowledge of petroleum geology.

Petromod Quantification of Uncertainty Analyses in Petroleum Systems Modeling

Advanced – 2 Days

In this course, attendees are introduced to the Petromod risk management system module. They discover basic statistics, uncertainty analysis in model building, and model calibration. In addition, attendees use theory and practical exercises to evaluate the impact of uncertainties in input data on individual models and understand dependencies and correlations between geological processes and model uncertainties.

COURSE CONTENT
- Navigate the PetroRisk module user interface
- Import and edit input uncertainties
- Perform statistics runs and evaluate output results
- Populate the model with risk points for which output results are stored
- Carry out a risk data analysis using 1D, 2D, and 3D Viewer
- Calibrate your model to fit measured values
- Develop workflows for risking and calibrating your model

AUDIENCE
Geologists, geophysicists, and geochemists with experience working in Petromod software.

PREREQUISITE
Introduction to Petromod course, and experience using Petromod platform software.

GeoX Advanced Prospect Assessment

Advanced – 1 Days

This course combines a review of the basic methodology for evaluating multiple compartment/zone prospects with hands-on assessment of real-world cases using GeoX software. Topics covered in this course include a shared risk and dependency group approach to modeling multisegment prospects plus volumetric correlations and multiple scenarios.

COURSE CONTENT
- Shared risk and dependencies
- Modeling multi segment prospects
- Volumetric correlations and multiple scenarios

AUDIENCE
Petrophysicists, Geologists and Geoscientists with prior experience of formation evaluation with Techlog

Techlog Thin Bed Analysis using the LowReP method

Advanced – 2 Days

In this course, you will review thin bed reservoir, perform an analysis, interpret the results and compute petrophysical summary. Thin bed reservoirs are also referred to as sands with low resistivity pay or LRLC (low resistivity, low contrast).

COURSE CONTENT
- Load and quality control the dataset
- Discuss how to identify well candidates for thin bed analysis
- Review measurements in an anisotropic environment
- Perform pre-computations for interpretation parameters
- Review the thin bed analysis model, including the effects of laminated shale, structural shale and dispersed clay minerals
- Determine true matrix and fluid endpoints for the thin bed model
- Define shale vertical and horizontal resistivity values using the modified Klein crossplot
- Compute volume of shale, porosity, and water saturation in a thin bed reservoir using the LowReP (low resistivity pay) module
- Perform a petrophysical summary on the thin bed results

AUDIENCE
Petrophysicists, Geologists and Geoscientists with experience working in GeoX software.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

AUDIENCE
Geologists, geophysicists, and reservoir engineers familiar with basic prospect assessment principles.

PREREQUISITE
None

PetroMod Advanced Topics

Advanced – 5 Days

In this 5-day course, attendees will construct complex geological models, control the processing of the models, discover available options and tools for petroleum migration modeling, and interpret and analyze the results. Through lectures and hands-on exercises, attendees alternate between 1D, 2D, and 3D modeling, which enables use of all PetroMod software packages.

This course is aimed at advanced users; practical experience has shown that the topics and workflows of interest vary widely between participants. The topics listed comprise a "standard" agenda. We are able to customize each class delivery for individual companies or groups of users and modify the agenda to suit local or specific needs.

COURSE CONTENT
- Construct petroleum systems models
- 2D salt modeling
- Model petroleum migration
- Introduce new PetroMod software simulator features
- Biodegradation
- Biogenic gas
- Shale gas
- Geomechanics

AUDIENCE
Geologists, geophysicists, and geochemists working in PetroMod software. This course is for advanced users.

PREREQUISITE
Introduction to PetroMod course and experience using PetroMod software.

Techlog Formation Evaluation

Advanced – 5 Days

Attendees will explore the use of the Techlog platform base modules: Techplot, Techdata, Quanti, and Quanti.min. In this class, attendees will acquire a solid foundation in the data model within the Techlog platform application and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images. Deterministic calculations and the principles behind the application workflow interface for single- and multiwell use are covered in this course, in addition to studying multiple log and component inversion techniques, thin-bed analysis, and integration of different types of data to enhance the interpretation process. Attendees will also learn how to perform day-to-day tasks within the Techlog platform suite and learn advanced techniques for improving the analysis results.

COURSE CONTENT
- Techlog platform interface and data structure
- Data management and QC
- Multiwell management
- Basic plotting tools
- Workflows for deterministic evaluation using Quanti modules

AUDIENCE
Geologists, Petrophysicists, and Geomechanics Specialists interpreting Quanta Geo images.

PREREQUISITE
Students should have at least basic familiarity with the Techlog user interface, data structure, workflow manager, and plots.
Techlog Processing and Interpretation of Quanta Geo Images with Techlog Fundamentals

**Advanced – 5 Days**

Participants are trained to use the Techlog wellbore software platform to perform processing and interpretation of photorealistic Quanta Geo formation images. A simplified physics lecture gives students a foundation of understanding the Quanta Geo physics of measurement. Starting from raw Quanta Geo data, students are taught to apply tool-specific signal processing methods in Techlog to remove borehole and mud effects and produce images that are most representative of the formation.

**COURSE CONTENT**

- Opening Remarks, Participant introductions and HSE
- TL Fundamentals - Import/Export, Database
- TL Fundamentals - Techplot, Workflow Interface
- TL Fundamentals - Wbi basics
- Exercise
- QG Physics and Processing Overview
- Ex. 1 - Process QG with default parameters
- QG Electromagnetics Fundamentals
- QG Physics
- QG Calibration
- QG 290 Modes
- QG Corrected Amplitude and Blending
- Ex. 2 - Processing parameters investigation
- Ex. 2 cont’d - Processing parameters investigation
- Ex. 3 - Processing challenging datasets
- QG Image Artifacts Catalog
- Interactive Depth Correction
- New Automatic Depth Correction
- Ex. 4 - Depth correction
- QG Utilities, Splicer, Drillmark Filter
- Ex. 5 - Mode splicing & remedial
- QG LOC & Deliverables
- Ex. 6 - Challenge Competition
- QG Virtual Core & Virtual Slab
- Ex. 6 - Challenge cont’d
- Challenge Results Presentations
- QG Inversion Principles & Demo
- QG Advanced Applications
- TL Wbi interpretation Basics
- QG Structural Analysis
- Results upscaling and export
- Open Discussion & Conclusion

**AUDIENCE**

Geologists, Petrophysicists and Geomechanics Specialists interpreting Quanta Geo images.

**PREREQUISITE**

This 5 days version of the course includes a 1 day primer on Techlog that will be sufficient to follow the exercises on days 2 to 5.

Techlog Borehole Image Interpretation

**Advanced – 3 Days**

In this course, attendees learn advanced interpretation and processing capabilities for the management of wellbore image data and the performance of interpretation workflows for data analysis. The attendees will gain a full range of skills to manipulate, process, and use all types of borehole image data within the Techlog platform suite.

**COURSE CONTENT**

- Load, process, and manipulate image data and core photos
- Pick dips and facies
- Interpret dips and facies

**AUDIENCE**

Development and exploration geologists and petrophysicists involved in wellbore image data processing and interpretation who have prior experience using Techlog platform software.

**PREREQUISITE**

Techlog Fundamentals course.

Techlog for Geologists

**Advanced – 5 Days**

In this course, attendees learn advanced interpretation and processing capabilities with a focus on the management of wellbore image data and the performance of interpretation workflows for analysis of these data. Topics include facies typing using neural network methods, multiwell plotting, cross section building, and mapping in the Techlog platform application. Learn to use Techlog platform geologic tools to achieve efficient data integration.

**COURSE CONTENT**

- Load, process, and manipulate image data and core photos
- Pick dips and facies
- Interpret dips and facies
- Neural network techniques for facies prediction
- Use zone editing for field maps, kriging, and multiwell cross sections

**AUDIENCE**

Development and exploration geologists with prior experience using Techlog platform software.

**PREREQUISITE**

Techlog Fundamentals course.

GeoX Reserve Tracker

**Skill – 2 Days**

This 2-day course combines lectures, exercises using manual calculations, and hands-on exercises using the GeoX software reserve tracker to illustrate resource classification concepts and their applications. It is designed to provide participants with an overview of tracking and management of company assets. The main part of the course is built around realistic cases, following changes in company resources and reserves within and between booking periods in terms of projects, assets, and entitlements. The first day focuses on the basic deterministic and stochastic booking of resources and reserves as well as creating new projects, assets, and entitlements. The concepts and application involve setting up the classification
model for dividing the different proven and unproven resources in the booking periods. The course will also provide a basic introduction to assessing projects resources classification and category in the context of a Petroleum Resource Management System framework (PRMS 2011).

**COURSE CONTENT**
- Introduction to reserve management basics
- Setting up the reserve tracker for manual booking
- Creating a new project with initial prospective resources and following this through maturation to reserves on production.
- Stochastic assessment of projects
- Automatic booking using GeoXplorer
- Reporting and reconciliation

**AUDIENCE**
Reserve managers, engineers, commercial team members, or managers with a need to analyze and validate the project and company assets

**PREREQUISITE**
Working knowledge of reserve management and previous experience with GeoX software is recommended.

### Petrel Well Design

**Foundation – 1 Day**

The purpose of this course is to introduce the well design module and the drilling functionalities in the Petrel platform. The attendees are guided through the preparation stage for data used in offset well analysis, which includes loading of drilling events, drilling logs, and using end of well reports to filter the knowledge database by, for example, data type, category, or event severity. Attendees will become familiar with the available well design approaches, including an enhanced method also used by drilling engineers. How to import trajectory and targets from third-party applications such as the Landmark Engineers Data Model (EDM™) will also be introduced. After the planning phase, attendees will learn how real-time data acquisitions are handled in the Petrel platform.

**COURSE CONTENT**
- Drilling event classification and visualization
- Webmap services
- Well design
- Well path design
- Real-time data acquisition

**AUDIENCE**
Drilling engineers, geologists, and petrotechnical personnel with fundamental knowledge in the Petrel platform and who need to understand well path design and optimization within the Petrel platform.

**PREREQUISITE**
Petrel Fundamentals course.

### PetroMod Calibration Workflows for Petroleum Systems Models

**Skill – 5 Days**

This 5-day workshop focuses on common workflows used in PetroMod software projects. Attendees will work with a single 3D dataset with emphasis placed on model calibration and output analysis (interpretation of simulation results). The major focus of this workshop will be on calibrating PetroMod software models to actual field data. Default lithological parameters (e.g., mechanical compaction, permeability) will be adapted to measured data (e.g., porosity, pore pressure). Thermal calibration tools will be introduced and used to calibrate the model to measured well data (temperature, vitrinite reflectance). Calibration workflows will require extensive use of the PetroMod editor and viewing tools. Different hydrocarbon migration methods (Darcy flow, flow path, and invasion percolation) will be introduced and their applications discussed. The outputs of different migration methods will be analyzed in detail. Hydrocarbon accumulations will be calibrated to volume (column height) and fluid properties (e.g., American Petroleum Institute [API], gas/oil ratio [GOR]). This workshop is a core component in the PetroMod software Education Services offering. Attendees successfully completing this course will be able to build petroleum system models having basic-to-moderate geological complexity.

**COURSE CONTENT**
- Porosity/pressure calibration
- Porosities, permeabilities, pressure, effective stress thermal calibration
- Temperature and vitrinite reflectance
- McKenzie model, Heat Flow calibration tool
- Migration modeling
- Migration methods: Darcy, flow path, Inversion Percolation hybrid
- Migration along faults
- Accumulation/fluid calibration
- Size, column height
- API, GOR

**AUDIENCE**
Development and exploration geologists, petrophysicists, and reservoir engineers with prior experience using PetroMod platform software.

**PREREQUISITE**
Techlog Fundamentals course and formation evaluation experience using Techlog platform software.

### Techlog Formation Evaluation with Quanti.ELan

**Skill – 2 Days**

This course introduces attendees who are experienced log interpreters to building log interpretation models and generating solutions with the Quanti.ELan module of the Techlog platform.

**COURSE CONTENT**
- Load and quality control data (from Digital Log Information Standard [DLIS] or log ASCII standard [LAS]) files
- Precomputation of critical parameters for interpretations, including mineral, rock, and fluid endpoints
- Log response equations with emphasis on neutron porosity and resistivity-based saturation equations
- Initialization and construction of formation evaluation models
- Zoning and classification groups
- Combining formation evaluation models
- Postprocessing
- Customization with Python module

**AUDIENCE**
Development and exploration geologists, petrophysicists, and reservoir engineers with prior experience using Techlog platform software.

**PREREQUISITE**
Techlog Fundamentals course and formation evaluation experience using Techlog platform software.
<table>
<thead>
<tr>
<th>Course Offering</th>
<th>Skill</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GeoX Full-Cycle Value Assessment Concepts and Application</strong></td>
<td>3 Days</td>
<td>This 3-day course provides participants with an overview of the concepts of full-cycle value assessment of exploration ventures. The course combines lectures, exercises using manual calculations, and hands-on exercises using GeoX software to illustrate assessment concepts and their applications. <strong>PREREQUISITE</strong> Working knowledge of project economics previous experience with GeoX software is recommended.</td>
</tr>
<tr>
<td><strong>Petrel Exploration Geology: Integrated Evaluation of Petroleum Systems, Plays and Prospects</strong></td>
<td>3 Days</td>
<td>This 3-day course the participant will learn to use the Petrel Exploration Geology software suite of integrated petroleum system-based play to prospect exploration tools and workflows (Petroleum Systems Quick Look and Play to Prospect Risk). Participants will undertake play evaluation exercises that integrate all the elements of the petroleum system into geologically-based, objective, consistent and documented results that can be used to understand and rank opportunities. <strong>Course Content</strong></td>
</tr>
<tr>
<td><strong>Petrel Volume-Based Modeling</strong></td>
<td>1 Days</td>
<td>This new 1-day course demonstrates the power of Petrel in building advanced structural models with complex faults and various horizon configurations, including crossing faults, Y faults, complex fault truncations, thin layers, etc. A troubleshooting module at the end of the course will present the main issues the user can face and how they can be corrected in the model. VBM, an innovative technique for the construction of complex structural frameworks from a new direction, will be part of the Petrel 2014 release. It is the only algorithm in the structural framework workflow. Attendees will be presented with workflows that combine both processes, specifically how to use the results from the structural framework to generate a corner-point grid. In Petrel 2013, VBM supplements the legacy methods FGD and MPI. Before taking this course, it is recommended to have completed the Structural Modeling course. <strong>Course Content</strong></td>
</tr>
<tr>
<td><strong>Petrel Structural Modeling</strong></td>
<td>3 Days</td>
<td>The 2013 Petrel platform Structural Modeling course presents different approaches to building models that capture geologically complex situations such as reverse faults and truncations. This course covers both corner-point gridding and structural framework. Attendees will be presented with workflows that combine both processes, specifically how to use the results from the structural framework to generate a corner-point grid. The attendees will also learn how to generate partially and fully stair-stepped 3D grids. The advantages and limitations of the different types of models will also be presented. The course will highlight the following: (1) the robust fault modeling while interpreting seismic functionality, which allows rapid real-time creation of the structural framework; (2) salt modeling techniques using both corner-point gridding and structural framework; and (3) the innovative volume-based modeling technique for the construction of complex structural frameworks. <strong>Audience</strong> Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience using the Petrel platform. <strong>Prerequisite</strong> Petrel Structural Modeling course and general knowledge of petroleum geology and geophysics.</td>
</tr>
</tbody>
</table>

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
COURSE CONTENT

- Preprocessing input data
- Corner-point gridding approach
  - Fault modeling
  - Pillar gridding
  - Layering
  - Truncations
- Reverse faults
- Structural framework approach
  - Geometry definition
  - Fault framework modeling
  - Fault modeling while interpreting
  - Horizon modeling
- Structural framework versus corner-point gridding
- Stair-step faulting
- Salt modeling methods
- Volume base modeling technique (Available on releases after 2013.1)

AUDIENCE

Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience using the Petrel platform.

PREREQUISITE

General knowledge of petroleum geology and geophysics, as well as having attended the Petrel Fundamentals and Petrel Geology courses or equivalent Petrel experience.

Petrel Fracture Modeling

Skill – 2 Days

This course focuses on the fundamentals of modeling using the Petrel platform. The course covers basic geostatistics, data preparation, data analysis, facies, and petrophysical modeling. Attendees will learn different ways to create property models and how to condition models to existing models and secondary data. This course guides the user through concepts, algorithms, and software functionalities in property modeling. The first portion of the course focuses on the use of basic geostatistical tools through data analysis. Also, premodeling processes concerned with well data preparation will be covered, the first step of which is the property modeling workflow, followed by upsampling well logs to create single-property values at the well location for each cell. This technique creates hard data that will be used to populate the 3D grid with either deterministic or stochastic algorithms. The second half of the course focuses on facies and petrophysical modeling, workflows using stochastic methods, as well as covering the usage of kriging for continuous properties. Implementing data analysis results and using secondary data to constrain the result will also be shown.

COURSE CONTENT

- Basics of uni- and bivariate geostatistics
- Data preparation, including well log edits, calculations, and upsampling for discrete and continuous data
- Facies modeling
  - Data analysis
  - Sequential indicator simulation
  - Object facies modeling
  - Truncated Gaussian simulation with and without trends
  - Using secondary data to populate facies models
- Petrophysical modeling
  - Data analysis
  - Sequential Gaussian simulation
  - Gaussian random function simulation
  - Kriging
  - Using secondary data to populate petrophysical models

AUDIENCE

Development and exploration geologists, geophysicists, geochemists, petrophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in using Petrel platform software.

PREREQUISITE

General knowledge of petroleum geology and attendance of the Petrel Fundamentals course or equivalent experience.

Petrel Property Modeling

Skill – 3 Days

This course covers basic geostatistics, data preparation, data analysis, facies, and petrophysical modeling. Attendees will learn different ways to create property models and how to condition models to existing models and secondary data. This course guides the user through concepts, algorithms, and software functionalities in property modeling. The first portion of the course focuses on the use of basic geostatistical tools through data analysis. Also, premodeling processes concerned with well data preparation will be covered, the first step of which is the property modeling workflow, followed by upsampling well logs to create single-property values at the well location for each cell. This technique creates hard data that will be used to populate the 3D grid with either deterministic or stochastic algorithms. The second half of the course focuses on facies and petrophysical modeling, workflows using stochastic methods, as well as covering the usage of kriging for continuous properties. Implementing data analysis results and using secondary data to constrain the result will also be shown.

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  - Using secondary data to populate facies models
- Petrophysical modeling
  - Data analysis
  - Sequential Gaussian simulation
  - Gaussian random function simulation
  - Kriging
  - Using secondary data to populate petrophysical models

AUDIENCE

Development and exploration geologists, geophysicists, geochemists, petrophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in using Petrel platform software.

PREREQUISITE

General knowledge of petroleum geology and attendance of the Petrel Fundamentals course or equivalent experience.

Petrel Introduction to Structural and Fault Analysis Module (RDR)

Skill – 4 Days

This Petrel platform module, developed by the Rock Deformation Research group,
provides a broad suite of tools for all aspects of visualizing, mapping, modeling, and analyzing faults in the Petrel platform workflow. Attendees will learn new ways to integrate fault geologic information into the reservoir simulation process. Examples will show the impact of fault integration into simulation models on prospect evaluations, volumes, and simulation responses. The course highlights critical risk factors that influence the analysis of prospects and field development programs and the workflows to capture the likely structural nature of the prospect or field and to understand the implications.

**COURSE CONTENT**

- **Exploration**
  - New methods for fault identification and mapping
  - Property predictions and analysis for Petrel structural framework modeling
  - Fault dip and dip direction: Mapping seismic onto faults and juxtaposition analysis
  - Tools for data cleanup for prospect creation and preparation for geomodeling
  - Streamlining the seismic interpretation process with structural sense checks
  - Creating trap maps and trap analyses
  - Fault juxtaposition mapping
  - Fault geometry and property analysis
  - Prediction of hydrocarbon column heights using capillary seals

- **Development**
  - Fault seal mapping
  - Fault communication mapping
  - Geomodel analysis tools for QA
  - Fault and grid geometric analysis
  - Fault throw and displacement analysis, including profiles and cumulative frequency plots
  - Susceptibility to failure of faults
  - Fault property predictions, calculations, and filtering
  - Reservoir juxtaposition analysis
  - Fault plane maps
  - Fault transmissibility multiplier computations
  - Geologic tuning of transmissibility multipliers

**AUDIENCE**

Development and exploration geologists, geophysicists, geomechanics, and reservoir engineers with prior experience in Petrel software.

**PREREQUISITE**

Petrel Fundamentals course and the Petrel Geology course. It is also an advantage to have some Petrel platform working experience.

**COURSE CONTENT**

- Workflow editor interface and logic
- Running predefined workflows
- Creating user-defined workflows
- Updating 3D models with new input data
- Uncertainty and optimization process and sensitivity and uncertainty analysis setup
- Structural uncertainty
- Fluid contact uncertainty
- Property uncertainty

**Petrel Volume-Based Modeling**

**Skill – 1 Days**

This new 1-day course demonstrates the power of Petrel in building advanced structural models with complex faults and various horizon configurations, including crossing faults, Y faults, complex fault truncations, thin layers, etc. A troubleshooting module at the end of the course will present the main issues the user can face and how they can be corrected in the model. VBM, an innovative technique for the construction of complex structural frameworks from a new direction, will be part of the Petrel 2014 release. It is the only algorithm in the structural framework workflow in Petrel 2013. VBM supplements the legacy methods FGD and MPI.

Before taking this course, it is recommended to have completed the Structural Modeling course.

**COURSE CONTENT**

- Introduction to volume-based modeling and dataset presentation
- Geometry definition and Fault modeling
- Horizon modeling
- Refine model and zones creation
- Troubleshooting

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers, managers, and technical personnel with experience using the Petrel platform.

**PREREQUISITE**

Petrel Fundamentals course or equivalent experience using the Petrel platform and general knowledge of geology and geophysics domain.

**Petrel Advanced Wells**

**Skill – 2 Days**

This course builds on the Petrel platform Reservoir Engineering course and goes more into depth on modeling of deviated wells. The standard well modeling with the ECLIPSE simulator and the ECLIPSE FrontSim module treats the entire wellbore as a single entity; therefore, the model cannot take into account pressure changes along the wellbore due to friction, valves, or pumps. Such devices are often used to provide a broad suite of tools for all aspects of visualizing, mapping, modeling, and analyzing faults in the Petrel platform workflow. Attendees will learn new ways to integrate fault geologic information into the reservoir simulation process. Examples will show the impact of fault integration into simulation models on prospect evaluations, volumes, and simulation responses. The course highlights critical risk factors that influence the analysis of prospects and field development programs and the workflows to capture the likely structural nature of the prospect or field and to understand the implications.

**COURSE CONTENT**

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  - New methods for fault identification and mapping
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  - Susceptibility to failure of faults
  - Fault property predictions, calculations, and filtering
  - Reservoir juxtaposition analysis
  - Fault plane maps
  - Fault transmissibility multiplier computations
  - Geologic tuning of transmissibility multipliers

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers, managers, and technical personnel with prior experience using the Petrel platform.

**PREREQUISITE**

Petrel Fundamentals course and the Petrel Geology course. It is also an advantage to have some Petrel platform working experience.

**COURSE CONTENT**

- Workflow editor interface and logic
- Running predefined workflows
- Creating user-defined workflows
- Updating 3D models with new input data
- Uncertainty and optimization process and sensitivity and uncertainty analysis setup
- Structural uncertainty
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**COURSE CONTENT**

- Introduction to volume-based modeling and dataset presentation
- Geometry definition and Fault modeling
- Horizon modeling
- Refine model and zones creation
- Troubleshooting

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience using the Petrel platform.

**PREREQUISITE**

Petrel Fundamentals course or equivalent experience using the Petrel platform and general knowledge of geology and geophysics domain.

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with horizontal wells to control the inflow profile along the well trace. To model these effects, a multisegmented well model must be used. This course explains the capabilities of this well model and how to use the Petrel platform to set up the model. Methods for adding completions such as valves and pumps and making development strategies using the equipment are also covered in this course. Sector models can be useful to study portions of a reservoir.

This course shows how to define sectors, select boundary conditions, and run sector models.

COURSE CONTENT
- Standard well model versus the multisegmented well model
- Pressure drop along horizontal wells
- Designing horizontal wells and wells with laterals
- Setting up multisegmented wells
- Completion design for multisegmented wells
- Development strategies with group control
- Sector models

AUDIENCE
Reservoir engineers or geoscientists with above average experience in the domain.

PREREQUISITE
Petrel Fundamentals and Petrel Reservoir Engineering or equivalent experience.

PETREL SHALE FOUNDATION – 3 DAYS

The course covers basic usage of the application, providing an understanding of how to get started with Petrel Shale Perspective tools. In addition, you will learn about Petrel interface, project set-up, data import and visualization, well section window, well correlation, seismic interpretation for horizons and faults, 1D petroleum system modeling, pad placements, pad well design tools, geosteering and plotting (general and production engineering).

COURSE CONTENT
- Introduction to Petrel
- Well data loading and data structure
- Well section
- Well tops use and interpretation
- Seismic interpretation
- Exploration tools
- Pad placement
- Pad well design
- Well design
- Geosteering
- Production engineering

AUDIENCE
Geophysicists, geologists, geochemists, and technical personnel not familiar with Petrel workflows and involved in shale oil and gas exploration and development.

PREREQUISITE
Knowledge on geosciences workflows

PETROLEUM SYSTEMS MODELING FUNDAMENTALS – 5 DAYS

This course is structured to provide attendees with the fundamentals of PetroMod software, which combines seismic information, well data, and geologic knowledge to model the evolution of a sedimentary basin. The attendees will learn how the software predicts whether and how a reservoir has been charged with hydrocarbons, including source and timing, migration routes, quantities, and fluid type in the subsurface or at surface conditions. Attendees will also gain a comprehensive overview of the one-dimensional (1D), 2D, and 3D basic workflows in basin modeling.

COURSE CONTENT
- Introduction to petroleum systems modeling
- Structural and geochemical features of a petroleum system model
- 1D Workflow
  - Input data and boundary conditions
  - Calibrating data using the Well Editor and calibrating models
  - Creating and editing lithologies
  - Special tools such as intrusion and fracturing
- 2D Workflow
  - Building a 2D model based on cross sections
  - Creating and editing horizons and faults
  - Assigning properties: Lithofacies, organofacies, geologic ages, QC, and pitfalls
  - Running the simulator
  - Analyzing results (output modules) and extracting data
- 3D Workflow
  - Constructing 3D models from maps
  - Editing horizons and faults
  - Assigning properties and geologic ages, QC, and pitfalls
  - Running the simulator
  - Analyzing results (output modules) and calibrating results

AUDIENCE
Geologists, geophysicists, and geochemists with little or no prior experience in using PetroMod software.

PREREQUISITE
Some knowledge of geology and an interest in Petroleum Systems Modeling (PSM). Participants new to petroleum system modeling will certainly benefit from attending the associated domain class, Basin Analysis and Petroleum Systems Modeling, reference GL-TC1-NXT14080.

TECHLOG PYTHON FUNDAMENTALS – 2 DAYS

This course is designed to introduce attendees to programming basic and advanced scripts in the Techlog platform. The attendees will learn how to create, edit, open, and run scripts in a Techlog platform workflow. Topics include Python™ syntax and programming skills, Python and Techlog program modules (libraries), and advance scripting, including reading and writing and creating Techlog platform modules.

COURSE CONTENT
- Introduction to Python scripting
  - History and concept
  - Python programming inside Techlog platform software
  - Introduction to the Python editor
- Opening and running scripts
  - Programming basics
- Python syntax and coding rules
- Application workflow interface for Python platform
  - Running your own equations in a multiwell and multizone environment
- Python modules
  - Data QC and harmonization, file import (Techlog platform database)
  - Custom plots (Techlog platform plot)
  - Mathematical and scientific tools (NumPy and SciPy packages)
- Advanced scripting
  - Introduction to advanced basics such as multidimensional lists and dictionaries
  - Introduction to oriented object programming
- Reading and writing files
  - Text, comma-separated values (CSV), and Excel files
  - Importing and loading data from Excel files
  - Reporting
- Creating modules and custom libraries

**AUDIENCE**

Software developers or geoscientists with basic programming skills interested in a general understanding of Python scripting in the Techlog platform software.

**PREREQUISITE**

Techlog Fundamentals course.

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**GeoX Prospect Assessment Fundamentals**

**Skill – 2 Days**

This 3-day course combines lectures, exercises using manual calculations, and exercises using GeoX software to illustrate assessment concepts and their applications. It is designed to provide participants with an overview of the concepts of prospect assessment and prepare them to assess both simple and complex prospects using the GeoX software.

**COURSE CONTENT**

- Segments: segment definition, segment volumetrics, volumetric uncertainty, segment risking
- Multiple segment prospects: independent segments, risk dependencies, correlations between segments, fluid communication

**AUDIENCE**

Geologists, geophysicists, and reservoir engineers involved with prospect assessment

**PREREQUISITE**

None although working knowledge of basic subsurface geomodels and exploration workflows is helpful

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**Petrel Well Correlation**

**Foundation – 3 Days**

This course demonstrates the various options for well correlation in Petrel. It covers well data import procedures using both Studio database and standard data loading workflows in Petrel. It focuses on setting up well section templates and on the value of sharing templates between projects, wells, and well section windows. Interpreting and editing stratigraphic and fault well tops (markers) along well paths based on log readings are covered along with the capability of using Studio Collaboration workflows to be notified when there is an update on your well tops interpretation.

**COURSE CONTENT**

- Project organization (including Favorites, Find & Studio Annotate)
- Import procedures for wells, well tops, logs
- Working with well sections and templates
  - Seismic and 3D model back drop
  - Different log editing options using the Log editor, the Log estimator, the Log calculator and the interactive Log conditioning tool.
- Well tops interpretation and edits
- Time/depth relationship
- Visualizing deviated wells
- Working with borehole images, core images, point well data and comment logs.

**AUDIENCE**

Development and exploration geologists, geophysicists, geochemists, petroleum engineers, managers, reservoir engineers and technical personnel with prior experience in Petrel.

**PREREQUISITE**

General knowledge of petroleum geology and the Petrel Fundamentals Course or equivalent Petrel experience.

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**Petrel Geology**

**Foundation – 3 Days**

This course is designed for users who are already familiar with Petrel, but who need to learn about Studio from a user’s perspective. The purpose of this course is to describe basic concepts used in Studio (such as repositories and indexes) and learn how to work in a Studio environment. The training focuses on tools in Petrel that interact with Studio. This course covers topics such as setting up a database connection and synchronizing data between a Petrel project and a Studio repository.

**COURSE CONTENT**

- Overview and basic concepts
- Petrel and the Studio Database
- Data transfers
- Find your data
- Collaborate with your team
- Manage your data

**AUDIENCE**

Geophysicists, geologists, geochemists, and technical personnel familiar working in Petrel, but no experience in Studio.

**PREREQUISITE**

None although working knowledge of basic subsurface geomodels and exploration workflows is helpful.
gridded surfaces or constants, are used to calculate volumes. The 3D model-based workflow focuses on the construction of a 3D grid, populating the grid with properties to be used in determining an accurate volume calculation.

**COURSE CONTENT**

- Surface generation and refinement
- Well interpretation and visualization
- Isochore processing
- Map-based volume calculations
- Structural framework
- Geometrical modeling
- Upscaling well logs
- Facies modeling
- Petrophysical modeling
- Contacts creating
- Volume calculations

**AUDIENCE**

Geoscientists, geophysicists, and engineers working on static and dynamic modeling.

**PREREQUISITE**

Petrel Fundamentals course or similar Petrel platform experience coupled with a general knowledge of petroleum geology and geophysics, as well as elemental software skills.

### Petrel Exploration Geology: Petroleum Systems Modeling Fundamentals

**Foundation – 5 Days**

This course teaches new users how to run Petrel® Exploration Geology v2015 software, specifically 1D and 3D Petroleum System Modeling (PSM) and Petroleum System Quick Look (PSQL). The Petrel Exploration Geology toolkit combines seismic information, well data, and geological knowledge to accurately model the evolution of sedimentary basins over time and optimally predict if and how reservoirs have been charged with hydrocarbons.

**COURSE CONTENT**

- Basin Analysis (Theory)
- Geochemical Analysis (Theory)
- Temperature Modeling (PSM)
- Generation (PSM)
- Migration (PSM)
- The Petroleum Systems Concept
- Limitations of PSM
- Accessing the Exploration Geology toolkit
- Overview of each tool and process
- Input data and set up 1D petroleum systems model
- Simulate 1D petroleum systems model
- A review of basic 1D simulator features and calibration workflows
- View and analyze results
- Calibrate model using basic principles of temperature and maturity calibration
- Input data, create maps, and edit function curves

**AUDIENCE**

Geologists and geoscientists involved in exploration projects from basin to prospect level, E & P professionals seeking a better understanding of the principles of petroleum systems modeling.

**PREREQUISITE**

Geology background, interest in Petroleum Systems Modeling (PSM). Petrel Fundamentals class, OG-SW0-SIS12520, or have a basic knowledge of the Petrel user interface.

### Petrel Fundamentals

**Awareness – 2 Days**

This course introduces a new user to the Petrel platform with emphasis on visualization, data organization, and collaboration. The course will take the attendee from Petrel project setup to plotting results. The attendee will learn how to create surfaces and create a simple grid, in addition to how to QC and visualize a simple grid using the geometrical modeling process, maps and intersections. The course also introduces the Studio knowledge environment, which empowers a new level of usability, collaboration and productivity.

**COURSE CONTENT**

- Studio environment (find, collaborate, and manage)
- Petrel platform introduction
- Project setup, coordinates, and units
- Petrel platform interface, general tools, and windows
- Overview of modeling concepts
- Create and edit surfaces
- Build a simple grid
- Geometrical modeling
- Data plotting
- Knowledge sharing and collaboration

**AUDIENCE**

Development and exploration geologists, geophysicists, geochemists, geoscientists, petroleum engineers, managers, and technical IT personnel with no prior experience in Petrel platform software.

**PREREQUISITE**

General knowledge of petroleum geology and geophysics or reservoir engineering, as well as elemental software skills is recommended.

### Techlog Fundamentals

**Awareness – 5 Days**

The Techlog platform interactive suite brings all of the petrophysical and geological
data together. Attendees will learn the fundamentals of this application and its Techplot, Techdata, and Quanti base modules. In addition, the use of the data model within the Techlog platform and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images, will be explained. The course topics include deterministic calculations and the principles behind the application workflow interface for single- and multiwell use.

**COURSE CONTENT**
- Techlog platform interface and data structure
- Data management and QC techniques
- Multiwell management
- Basic plotting tools
- Workflows for deterministic evaluation using Quanti module
- User-defined programming language
- Advanced Techlog platform modules

**AUDIENCE**
Development and exploration log analysts and petrophysicists, geologists, petroleum engineers, managers, and technical personnel with no prior experience using the Techlog platform.

**PREREQUISITE**
None

**Petrel User Experience**

**Awareness – 1 Days**

The course describes the new design elements that encompass the user interface and demonstrates its efficiency through workflow exercises. These workflow exercises cover each domain including geology, geophysics, exploration geology, reservoir engineering, production engineering and drilling. Participants will carry out those workflows pertinent to them.

**COURSE CONTENT**
- Design elements of the 2014 User experience
- Studio tools and usage with the new user interface
- Exploration Geology workflow: Petroleum systems 1D and 3D data access
- Geology workflow: Well correlation and 3D modeling
- Geophysics workflow: Seismic display and horizon interpretation
- Reservoir Engineering workflow: Create and run a simple simulation case
- Well Design workflow: Create well plans that intersect geological targets
- Well Deliverability workflow: Well completion design

**AUDIENCE**
Geoscientists with a need to learn prospect exploration fundamentals and how to perform workflows using Petrel software platform

**PREREQUISITE**
Petrel Software Fundamentals, OG-SW0-SIS12520.

**Practical Applied Geostatistics with Petrel**

**Skill – 5 Days**

This 5-day course covers the statistical and geostatistical tools available for understanding and quantifying uncertainty and the considerations required for use in reservoir characterization and model building. The Petrel E&P software platform will be used to investigate the complexities of uncertainty in geomodeling, enabling an understanding of the best way to use the advanced geostatistical features to construct geomodels. The course is designed to increase knowledge and understanding of uncertainty in geomodeling and provide a framework for optimum decision making.

**COURSE CONTENT**
- Uncertainty in data, how it arises, modeling and quantifying it, why geostatistics differ from statistics, how geostatistics describes uncertainty, separating the known from the unknown, and distinguishing between uncertainty and measurement
- Uncertainty in prediction, how variability affects measurement, variance within a single dataset, placing bounds on the unknown and using them to make better predictions and to quantify uncertainty in predictions
- Geomodeling, its role in modeling the predictable and unpredictable, the history of geomodeling tools, and the search for balance
- Using large and complex datasets, multivariate analysis and log suites and seismic attributes
**Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel**  
**Skill – 5 Days**

This 5-day interactive and practical course will introduce the procedures and workflow for building a 3D model, teaching attendees about the use of geological modeling to produce realistic volumetric estimations for hydrocarbon reservoirs. It will show how new operational data and revised interpretations can be identified and incorporated into models at any point in the workflow. Exercises will be done using the industry-standard Petrel® E&P software platform.

Relevant industry case studies and practical applications will be reviewed throughout the course. Attendees will gain an understanding of the key challenges associated with building effective 3D reservoir models, from interpretation and design to quality assurance and optimization of results.

They will also gain an understanding of the science and workflows behind building consistent 3D reservoir models, including fluid distribution, permeability, compartments, and volumetric estimation and learn how to integrate data from cores and logs and how to upscale the data into geological and flow simulation models that will have a high impact on field development and production scenarios.

**COURSE CONTENT**

- Conceptual design and workflow
- Reservoir envelope: top and base structure
- Internal framework: correlation scheme
- Reservoir compartments: fault geometry
- Reservoir architecture: facies model
- Petrophysical property distribution
- Volumetric assessment
- Reservoir framework
- Depth conversion uncertainty
- Model surface selection and quality control
- Fault modeling and compartments
- Stratigraphy and correlation
- Grid construction
- Reservoir architecture
- Depositional models and facies analysis
- Core log integration
- Basic statistics
- Objects and indicators
- Seismic conditioning
- Facies modeling
- Property modeling in 3D
- Basic petrophysics
- Rock typing
- More basic statistics
- Porosity models
- Saturation models
- Permeability models
- Uncertainty and Upscaling
- Geological model analysis
- Hydrocarbon volumes initially in place
- Drainable volumes
- Simulation grid construction
- Property upscaling
- Multiple scenarios, realizations, and ranking

**AUDIENCE**

Geologists, petroleum engineers, and geophysicists with a need to build models in Petrel software platform

**PREREQUISITE**

Introduction to Petrel platform training course and a basic understanding of statistics.

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**Mapping the Subsurface**  
**Skill – 5 Days**

This course will take the attendee through the primary techniques for constructing two-dimensional (2D) maps and sections of the subsurface, including the integration of well data and key surfaces defining the framework of geologic units in the subsurface as the foundation of subsurface evaluation. These initial 2D techniques allow the interpreter to display the 3D relationships of geologic surfaces and any associated faults, which are key to defining the spatial and volumetric aspects of the associated subsurface resource. The geologic surface and fault relationships analyzed in this course will also be linked to the overall aspects of depositional settings and structural styles that are present within global development of geologic terrains.

**COURSE CONTENT**

- Course objectives, history and principles of surface mapping across structural styles
- Wellbore correlation of vertical and directional drilling data to subsurface feature mapping
- Applications of fault and surface mapping techniques to structural styles: strike-slip, growth, compressional, and thrust
- Petrel platform mapping introduction – volumetric calculation from surface mapping
- Computer contouring techniques

**AUDIENCE**

Geologists, petroleum engineers, and geophysicists involved with the development of oil and gas reservoirs and needing knowledge of correlation and structural/stratigraphic mapping techniques.

**PREREQUISITE**

A fundamental understanding of geologic concepts. The Petrel platform software will be used in the course. Although it is strongly suggested that attendees have taken the Introduction to Petrel course, it is not required.
Structural and Fault Analysis using Petrel - Integrated theory, outcrop and software - Northumberland, NE England

Skill – 5 Days

This course combines theory, outcrop and software training on the methods for the interpretation of fault geometry and fault zone processes and the analysis of fault compartmentalization in exploration and development plays. The group is divided into teams of two to work together in producing a model using Petrel for presentation at the end of the course.

COURSE CONTENT

- Health and safety briefing
- Overview of the Tynemouth Priory outcrop to discuss some features of the regional geology
- Regional geology overview
- Lecture – Fault Geometry, Kinematics and Architecture
- Review of regional Petrel model
- Drive to Hartley Steps car park to examine exposures of the Crag Point Fault
- Exercise – compile stratigraphic log
- Juxtaposition analysis based on log and faults in outcrop
- Scale of observation: outcrop vs seismic and implications
- Fault zone architecture and implications
- Horizon clean-up tool
- Building horizons and layering
- QC of fault / horizon intersections
- 1D juxtaposition tool
- Discussion on scales of observation
- Outcrop-scale fault geometry and implications
- Fault rock types and fault architecture
- Lecture – Fault rock property types, distributions and prediction methods. Fault seal theory and controls on flow.
- Exercise – Fault seal exploration workflow in Petrel
- Walk to Cullercoates Bay to examine the 90 Fathom fault
- Examine deformation bands associated with the fault – thickness, orientation, density, spatial variation
- Discussion on the impact of fluid flow
- Final presentations
- Course evaluations and course summary

AUDIENCE

The course is designed for exploration and production geologists, geophysicists and engineers working in the subsurface interpretation of faulted prospects in exploration and development plays.

PREREQUISITE

Experience with Petrel is recommended.

Fluvial and Deltaic Architecture and Advanced Modeling using Petrel - Utah / Colorado, USA

Skill – 7 Days

This field and classroom-based reservoir geology and modeling course covers applied techniques for reservoir geocellular modeling. The course focuses on teaching participants novel and practical methods to build realistic models of fluvial and deltaic sediment body architecture, demonstrated using Petrel software.

The course follows the typical workflow of a sub-surface 3-D modeling study and is aimed at making a series of realistic predictive models of reservoir geometry and architecture using detailed knowledge of sedimentology and sequence stratigraphic concepts.

COURSE CONTENT

- Colorado National Monument – basin-scale stratigraphic overview
- Thompson Rest Halt - Book Cliffs overview
- Tusher Canyon – a single shoreface parasequence
- Woodside Trail Canyon – Kenilworth Mbr. exercise
- Beckwith Plateau – seismic scale overview
- Tusher Canyon overview – Kenilworth Mbr.
- Battleship Butte – Kenilworth Mbr.
- Tusher Canyon – Castlegate Sst
- Tusher Canyon – Desert Mbr.
- Tusher Canyon – Grassy Mbr.
- Blaze Canyon west – Desert/Castlegate
- Blaze Canyon – Desert/Castlegate
- Return travel to Grand Junction via: Colorado River Valley

AUDIENCE

Geologists and Reservoir Modelers

PREREQUISITE

Petrel Fundamentals or at least 3 months of application usage experience.

Trap and Seal Risking in Exploration and Development - A field and lecture workshop - Moab, Utah

Skill – 6 Days

The main objective of this course is to use field exposures supplemented with classroom lectures and outcrop exercises to train attendees on the methods and concepts on interpreting fault geometry and seal and evaluating associated risk to improve the interpretation of faulted traps in the subsurface. The course starts with lectures on Sunday afternoon in Grand Junction, Colorado and ends on Friday evening in Grand Junction with a group meal at a local restaurant, although most of the week is spent in Moab, Utah where the outcrops are within a short driving distance.

COURSE CONTENT

- Attendees arrive in Grand Junction and meet at hotel meeting room in early afternoon.
- Introduction and course overview.
- Leave early in the morning and spend the day on a drive from Grand Junction to Moab with outcrop stops (basement involved deformation, regional geology).
- Arrive early evening in Moab, Utah.
- Depart early to Arches National park and spend the day discussing and observing fault geometry and trap styles at range of scales and participating in team exercises.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
The course is designed for exploration and production geologists, geophysicists and engineers working in both extensional and structural terrains.

PREREQUISITE

Knowledge of Geology is suggested. As this is a field trip, a reasonable degree of physical fitness is expected.

COURSE CONTENT

- Attendees arrive at Athens in late afternoon and meet at Sofitel hotel, Athens airport.
- Drive to Loutraki along the eastern coast of the Gulf of Corinth (approximately 1 hour) and check into local hotel.
- Dinner and introduction in hotel restaurant.
- Early morning: Drive to Monastery-fault northwest of Loutraki with view of Corinth canal and Gulf of Corinth.
- Heraion on western tip of peninsula.
- Psia fault (fault scarp from 1981).
- Skinos beach – fault overview.
- Continue drive along coast with a few stops to view fault scarps and active subsidence in hanging wall from sunken lagoons and raised beaches.
- Lunch in field.
- Psatha bay fault.
- Return to Loutraki with view and discussion of Megara Basin.
- Dinner in Loutraki
- Check out of hotel and drive to Corinth canal (approximately 10 minutes).
- Lunch on boat down Corinth Canal (depending on availability).
- Time permitting, walk down the tracks along the northwestern part of the canal to view the stratigraphic variability and deposition during unique stages of subsidence.
- Drive to Kalavrita (approximately 2 hours) and check into hotel.
- Dinner in town.
- Morning Lectures.
- Lunch in hotel.
- Drive to Mount Helmos and map fault and sediments down into valley towards Kalavrita.
- Quarry overview stop for regional fault geometry overview.
- Late morning drive to monastery overview of valley from café and walk up to monastery to view the Dhoumena fault exposure and associated sedimentary fill.
- Return south to map quarry fault, and further up the road to map the trace of the fault and the associated sedimentation and to discuss fault linkages.
- Lunch in field.
- Map fault along road section and follow geological contacts up wind-turbine overview.
- Drive across road and up to wind-turbine overview for regional view of faults in valley.
- Dinner in town
- Early morning lecture (total approximately 1.5 hours in classroom).
- Late morning drive to monastery overview of valley from café and walk up to monastery to view the Dhoumena fault exposure and associated sedimentary fill.
- Return south to map quarry fault, and further up the road to map the trace of the fault and the associated sedimentation and to discuss fault linkages.
- Lunch in field.
- Map fault along road section and follow geological contacts up wind-turbine overview.
- Late morning: Drive to monastery cliff face cross-section overview for detailed mapping of tilted fault blocks.
- Climb to Dhoumena fault outcrop exposure and discuss the fault zone processes and seal controls.
- Map tilted fault cliff face overview and review regional and local fault geometry.
- Lunch in field.
- Drive north to coastal overview of fan delta overlooking Gulf of Corinth and discuss fault controls on sedimentation, fault timing and rates of motion and fault linkages.
- Return by retracing route back to Kalavrita.
- Dinner in town.
- Lecture on Petrel Structural and Fault Analysis module workflows
- Teams start to build 3D model of mapped faults and stratigraphy using the map base from the outcrop exercises.
- Late morning: Drive back to monastery turn-off to exposures of modern fan deltas.
- Lunch in field or taverna during afternoon.
- Kerinitis fan delta overview and discussion of the fault kinematics and control on depositional styles.
- Return making stops along western edge of study area to discuss the regional fault extensions.
- Dinner on own in town.
- Teams work to complete Petrel exercises and prepare presentations.
- Lunch in town.
- Make final presentations.
- Course review and evaluations.
- Final group dinner.
AUDIENCE
The course is aimed at geologists, geophysicists and reservoir engineers who wish to improve their skills in subsurface interpretation and the 3D modelling of rift settings.

PREREQUISITE
A general background knowledge of geological concepts and Petrel is assumed.

Field Trip: Characterization and Petrel 3D Modeling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous: East Kentucky, USA

Skill – 5 Days

This course is a field and classroom-based reservoir characterization and modeling course that focuses on capturing the geological knowledge necessary to build realistic models of coal-bearing fluvial and deltaic sediment body architecture using the Petrel platform. The course, based in Lexington and Prestonsburg, Kentucky, follows the typical workflow of a subsurface 3D modeling study and is aimed at fluvio-deltaic reservoir characterization and making realistic predictive models of sedimentary geometries and architecture by incorporating detailed knowledge of sedimentology and sequence stratigraphic concepts. Outcrops, cores and well logs are studied to characterize both small- and large-scale patterns of sedimentary architecture within a sequence framework in these carboniferous coal-bearing fluvio-deltaic sediments.

COURSE CONTENT
- Evaluate outcrop, core, and log interpretation of coal-bearing fluvio-deltaic environments and facies
- Build a sequence stratigraphic framework in coal-bearing sediments for reservoir modeling
- Study coal and coal-bearing sediment correlation techniques from well data
- Develop deterministic modeling techniques for coal-bearing sediments, horizons, zones, and layering using Petrel platform software
- Develop and apply isochores to control sediment body shapes
- Compare modeling results from different Petrel platform techniques
- Analyze static connectivity of different facies modeling techniques

AUDIENCE
Geoscientists interested in characterizing and realistically modeling sedimentary architecture to support hydrocarbon, coal-bed methane or coal extraction.

PREREQUISITE
Working knowledge of Petrel platform software is necessary to obtain the maximum benefit from the class.

From Field to Simulator - An Applied Basin and Petroleum Systems Modeling Workshop

Skill – 5 Days

This blended field to classroom workshop aims to observe and discuss the petroleum systems elements and processes based on the visit of high quality outcrops, prior to the integration of those field observations into the Schlumberger software PetroMod. Hands-on exercises and group discussions build the core of the classroom sessions.

COURSE CONTENT
- General introduction
- Introduction to Basin and Petroleum Systems Modeling
- Basic theory
- Case study Lokichar Basin
- Introduction to Lodeve Basin

Trap and Seal in Exploration and Development: Integrated theory, outcrop and software - Petrel Structural and Fault Analysis module - Moab UT, USA

Skill – 6 Days

This course integrates lecture-theory, outcrop observations and exercises, and the Petrel Structural and Fault Analysis module to improve interpretation and analysis of fault and trap geometry, fault zone processes, and trap and seal risks in exploration and development projects. The main objective of this course is to use field exposures supplemented with classroom lectures and software exercises to train attendees on the methods and concepts on interpreting fault geometry and seal and associated risk to improve the interpretation of faulted traps in the subsurface.

COURSE CONTENT
- Enroute discuss the regional geological setting in the Piceance and Paradox basin and the Uncompahgre uplift for a regional overview.
  - STOP 1: Riverside stop to view stratigraphy.
  - STOP 2: Hittle Bottom to view regional tectonic maps and discuss well logs etc.
- General course overview, introduction, goals and outcomes.
- HSE discussion.
- Regional geological overview.
- Fault evolution and linkage (2hrs).
- Introduction to the SFA module in Petrel.
  - Stop 1: Regional overview on Potash road.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
IMMERSIVE LEARNING PROGRAMS

Integrated Petrel exercise: Cache Valley relay.


Late morning and afternoon: Field Exercise reviewing juxtaposition triangle diagrams and fault zone Discuss deformation in damage zones and small-scale faulting.

Includes practical sessions Completion of integrated exercises.

Calibrated trap analysis and volume prediction.

Completion of integrated exercises.

Calibrated column height and seal capacity estimates.

Applied seal analysis and prospect evaluation – identifying and risking fault windows, identifying fault spills and estimating fault sealing capacity.

Stop 2: Moab anticline exercise.

Group exercise mapping Moab Anticline prospect.

Integrated exercise: Moab anticline.

Geomodel construction and evaluation of the Moab anticline prospect mapped in field based exercise in Day 3.

Evaluation of horizons and faults.

Juxtaposition analysis and introduction to fault property analysis.

Discussion on integrated exercise.

Late morning and afternoon: Field

Northern part of Moab Fault

Map exercise of Moab Fault to review normal fault linkages and associated deformation.

Discuss fault zone architecture.

Discuss deformation in damage zones and small-scale faulting.

Exercise reviewing juxtaposition triangle diagrams and fault zone characteristics.

– Stop 1: Overview of Moab Fault.

– Stop 2: Overview of relay ramp from distance.

– Stop 3: Mapping breached relay.

Integrated trap analysis and volume prediction.

Completion of integrated exercises.

Calibrated column height and seal capacity estimates.

Applied seal analysis and prospect evaluation – identifying and risking fault windows, identifying fault spills and estimating fault sealing capacity.

AUDIENCE

The course is designed for exploration and production geologists, geophysicists and engineers working in seismic interpretation of faulted prospects in exploration and development plays.

PREREQUISITE

good understanding of Geology and also experience PETREL software application are recommended.

Field Trip: Practical Fracture Analysis of Classic Reservoirs with Petrel: Casper, Wyoming, USA

Skill – 5 Days

This 5-day course combines field and classroom training sessions that integrate model building using the Petrel platform with classic field observations. The field trip portion of the course will consist of short excursions to view the oilfield facilities, surface geology, and outcrops in the area as well as time spent viewing core. This course provides the geoscience professional with tangible examples of the conceptual models they create. The classroom portion of the course is a 2-day hands-on Petrel platform fracture modeling course delivered in a classroom facility in Casper, Wyoming, in cooperation with the staff at the Rocky Mountain Oil Testing Center (RMOTC). The RMOTC is a 10,000-acre U.S. Department of Energy facility located within the Naval Petroleum Reserve No. 3 (NPR-3), also known as Teapot Dome Oil Field, roughly 35 miles north of Casper where the data used in the Petrel platform fracture modeling course was collected.

COURSE CONTENT

• Introduction at RMOTC office

• Field site trip and short field exercises

• Core lecture, visit OMNI Laboratories, and exercise involving three Teapot Dome Tensleep cores, standard wireline and FMI* fullbore formation microimager logs, detailed core descriptions and correlations

• Visit Alcova Lake field Location, box lunch, lecture, exercises

• Visit Tensleep of Fremont Canyon

• Petrel platform fracture modeling, fracture theory, fracture data analysis and QC

• Build a discrete fracture network (DFN), upscaling, building DFN using multiple frac drivers, dual porosity/permeability simulation

• Finalize models built in the Petrel platform, presentation of results and roundtable discussion

• Visit Emigrant Gap anticline and Bessemer anticline

AUDIENCE

Geoscientists, engineers, and Petrel modelers.

PREREQUISITE

Must have working Petrel knowledge.

Structural and Fault Analysis using Petrel -Integrated theory, outcrop and software - Northumberland, NE England

Skill – 5 Days

This course combines theory, outcrop and software training on the methods for the interpretation of fault geometry and fault zone processes and the analysis of fault compartmentalization in exploration and development plays. The group is divided into teams of two to work together in producing a model using Petrel for presentation at the end of the course.

COURSE CONTENT

• Health and safety briefing

• Overview of the Tynemouth Priory outcrop to discuss some features of the regional geology

• General overview and introduction to course, goals and outcomes

• Regional geology overview

• Lecture – Fault Geometry, Kinematics and Architecture
**IMMERSIVE LEARNING PROGRAMS**

**COURSE OFFERINGS**

- **Syn-Rift Carbonate Platforms; Miocene-Recent Gulf of Suez**
  - **Skill – 6 Days**
  - This 6-day field and classroom based course investigates the complex facies relationships found in rift basin carbonate platforms and provides insights into syn-sedimentary structural influences and changing depositional environments with rift basin evolution. Based on the shores of the southern Gulf of Suez this course starts with a review and update on the processes of carbonate sedimentation using the natural laboratory of the nearby modern, shallow marine environments.
  
  **COURSE CONTENT**
  - Lectures and classroom exercises: Introduction to processes of carbonate accumulation, carbonate factories and depositional environments. Florida case study
  - Modern carbonate grains and textural classification of carbonates; the building blocks for limestone formation
  - Carbonate facies and facies models.
  - Field Study: Carbonate grain types and early lithification in subtropical lagoon, beach, fringing reef and wadi environments, clastic-carbonate interactions in shallow marine setting. Sharm El Naga, NW Red Sea
  - Evening classroom: Gulf of Suez - Red Sea rift basin geological evolution
  - Lectures and Classroom Exercises
  - Principles of carbonate sequence stratigraphy. Outcrop and seismic sequence stratigraphy of carbonates,
  - Tectonic classification of carbonate platforms.
  - Field study of a Miocene fault-block carbonate platform on the Gulf of Suez rift margin. Stratigraphic and structural settings, footwall to hangingwall facies associations, sequences and potential reservoir facies.
  - Evening exercise: Interwell correlations in fault-block platform setting.
  - Field study of stratigraphic architecture and carbonate facies associations in a transfer zone setting. Changing carbonate factories with rift basin isolation
  - Exercise on stratigraphic logging and facies correlation
  - Lectures and classroom exercises on rift basin carbonates; structural settings of platforms in marine to lacustrine and evaporitic basins. Non-marine-lacustrine carbonates in rift basin settings; facies and facies models.
  - Exercises on interpetation of marine and lacustrine carbonate reservoir rocks

**AUDIENCE**

Petroleum geologists, general geologists, sedimentologists, reservoir modellers, reservoir engineers, petrophysicists.

**PREREQUISITE**

Basic knowledge of Geology

- **3D structural modelling of rift-scale fault geometry and stratigraphy: a field, lecture and Petrel workshop – Petrel Structural and Fault Analysis module - Gulf of Corinth, Greece**
  - **Skill – 8 Days**
  - The course is designed to demonstrate the geometric and kinematic features of normal faults, with an emphasis on systematic variation of displacement, and the associated sedimentation at seismic scale. The course combines outcrop observations and mapping with the construction of 3D structural models of the fault geometries, the stratigraphy, and associated structural “traps” and fault juxtapositions using the Petrel Structural and Fault Analysis module. The participants will have an understanding of the applications in the Petrel Structural and Fault Analysis module to improve the workflows for fault and

**AUDIENCE**

The course is designed for exploration and production geologists, geophysicists and engineers working in the subsurface interpretation of faulted prospects in exploration and development plays

**PREREQUISITE**

Experience with Petrel is recommended.
COURSE CONTENT

- Attendees arrive at Athens in late afternoon and meet at Sofitel hotel, Athens airport.
- Drive to Loutraki along the eastern coast of the Gulf of Corinth (approximately 1 hour) and check into local hotel.
- Dinner and introduction in hotel restaurant.
- Early morning: Drive to Monastery-fault northwest of Loutraki with view of Corinth canal and Gulf of Corinth.
- Hераиоν on western tip of peninsula.
- Писια fault (fault scarp from 1981).
- Сκίνος beach – fault overview.
- Continue drive along coast with a few stops to view fault scarps and active subsidence in hanging wall from sunken lagoons and raised beaches.
- Lunch in field.
- Πσαθά bay fault.
- Return to Loutraki with view and discussion of Megara Basin.
- Dinner in Loutraki.
- Check out of hotel and drive to Corinth canal (approximately 10 minutes).
- Lunch on boat down Corinth Canal (depending on availability).
- Time permitting, walk down the tracks along the northwestern part of the canal to view the stratigraphic variability and deposition during unique stages of subsidence.
- Drive to Kalavrita (approximately 2 hours) and check into hotel.
- Dinner in town.
- Morning Lectures.
- Lunch in hotel.
- Drive to Mount Helmos and map fault and sediments down into valley towards Kalavrita.
- Quarry overview stop for regional fault geometry overview.
- Drive across road and up to wind-turbine overview for regional view of faults in valley.
- Dinner in town.
- Early morning lecture (total approximately 1.5 hours in classroom).
- Late morning drive to monastery overview of valley from café and walk up to monastery to view the Dhoumena fault exposure and associated sedimentary fill.
- Return south to map quarry fault, and further up the road to map the trace of the fault and the associated sedimentation and to discuss fault linkages.
- Lunch in field.
- Map fault along road section and follow geological contacts up wind-turbine overview.
- Return to valley and cross main road to quarry fault and southern loop mapping quarry fault.
- Return to Kalavrita and dinner in town.
- Morning lecture.
- Late morning: Drive to monastery cliff face cross-section overview for detailed mapping of tilted fault blocks.
- Climb to Dhoumena fault outcrop exposure and discuss the fault zone processes and seal controls.
- Map tilted fault cliff face overview and review regional and local fault geometry.

AUDIENCE

The course is aimed at geologists, geophysicists and reservoir engineers who wish to improve their skills in subsurface interpretation and the 3D modelling of rift settings.

PREREQUISITE

A general background knowledge of geological concepts and Petrel is assumed.

Delta-slope-turbidite deposition and synsedimentary deformation - County Clare, Ireland

Skill – 6 Days

Using seismic scale cliff exposures of Namurian strata, the course will demonstrate depositional complexities and syndepositional deformation structures that characterise delta-slope-turbidite successions. Exposures include 200m high cliffs of Carboniferous strata of County Clare currently undergoing intensive research and recently highlighted in an article in the AAPG Explorer magazine.

COURSE CONTENT

- George’s Point, east side of Kilkee Bay to introduce the local stratigraphy and setting.
- Mouth bar sands, upper part of the Kilkee cyclothem;
- Penetrative mud diapir; flooding surfaces and marine bands.
- Loop Head; general basinal context; Ross Formation turbidites.
- Kilbaha Bay; Kilcloher Head. Turbidite facies including channels and mega-flutes.
- Bridges of Ross and east of Ross; major slump sheets, turbidite channels and sand volcanoes.
- Ross Formation at Kilcredaun;
- Boat trip from Carrigaholt: Ross Formation in sea cliffs between Carrigaholt and Loop Head.
- Possible boat trip to south side of Shannon: basinal Clare Shales and base of Ross Formation.
- South of Tullig Point: Gull Island Formation (major basin-filling slope and slope ramp), lower part of Tullig cyclothem (oldest deltaic progradation). Tullig Sandstone (palaeovalley).
- Killard: upper part of Tullig slope succession; minor mouth bar, abandonment/ flooding events, Tullig Sandstone with soft-sediment deformation.
IMMERSIVE LEARNING PROGRAMS
Regional overview
Fisherstreet: basal turbidites of northern margin and major slump sheet.
West End, Kilkee: Minor mouth bars in Tullig cyclothem; non-penetrative mud diaper; Kilkee cyclothem and sandstone.
Carrowmore Point: Upper part of Tullig cyclothem; channel sandstone; flooding surfaces.
Fisherstreet: basal turbidities of northern margin and major slump sheet.
Cliffs of Moher: northern equivalent of Gull Island and Tullig cyclothem.

AudiENCE
Petroleum geologists, general geologists, sedimentologists, reservoir modellers, reservoir engineers.

PREREQUISITE
None

From Field to Simulator - An Applied Basin and Petroleum Systems Modeling Workshop

Skill – 5 Days

The Lodeve Basin (southern France) is an outstanding example of a half graben basin, with well exposed source, reservoir and seal rocks, and oil seeps proving the presence of an active petroleum system. This blended field to classroom workshop aims to observe and discuss the petroleum systems elements and processes based on the visit of high quality outcrops, prior to the integration of those field observations into the Schlumberger software PetroMod. Hands-on exercises and group discussions build the core of the classroom sessions.

COURSE CONTENT
- General introduction
- Introduction to Basin and Petroleum Systems Modeling
- Basic theory
- Case study Lokichar Basin
- Introduction to Lodeve Basin
- Overview of Lodeve Basin
- Base Permian unconformity
- Lower Permian black shales: source rock stratigraphic logging exercise
- Mid Permian unconformity
- Red Permian and Permo-Triassic unconformity
- Overview of syn-rift geometry in Red Permian
- Synrift faulting and role in hydrocarbon migration and trapping
- Fracture dynamics
- Regional overview
- Recapitulation of field observations
- Upscaling exercise of logged source rock stratigraphy
- 10 petroleum systems modeling
- Calibration to field measurements
- 10 scenarios
- 2D petroleum systems modeling workflow
- 2D scenarios (source rock properties, migration pathways, etc.)
- Continental rift basin analogues
- Discussion and conclusion

AUDIENCE
The workshop is designed for geoscientists or other oil and gas professionals with petroleum geology background, as an introduction or reminder of basin and petroleum systems modelling.

PREREQUISITE
Basic understanding of petroleum geology and basin geology is necessary. Prior experience in PetroMod software might be helpful for the exercises but is not required.

Reservoir-scale heterogeneity in Upper Miocene Platforms of the Balearic Islands.

Skill – 6 Days

The objective of this field trip is to understand the factors that control facies belts distributions, platform architecture and internal distribution of heterogeneities. The first part of the course covers a Lower Tortonian depositional sequence consisting of a transgressive systems tract (nearshore carbonates onlapping and backstepping onto Neogene and Mesozoic rocks) and a highstand systems tract (HST) that corresponds to an aggrading and prograding, high-energy, distally steepened ramp. The second part concentrates on an Upper Tortonian / Lower Miocene depositional sequence comprising a prograding, reef-rimmed platform resulting from euphotic carbonate production by a framework-dominated reef system.

COURSE CONTENT
- Menorca. Introduction lecture on the geology of Western Mediterranean and Balearic Islands
- Outcrops of inner and middle zones of the Migjorn Ramp.
- Lecture on carbonate platforms
- Ramp slope. Toe of slope dunes. Gravity flows. Sub-wavebase grainstones
- Phosphatic crust at the transition between rhodalgal ramp and overlying reef complex
- Lecture on Ecological Accommodation Concept
- Pre-ramp fan delta, unconformity and backstepping beach (TST)
- Fly to Majorca
- Lecture: Linear vs non-linear response of carbonate platforms to sea-level changes
- Llucmajor Platform outcrops.
- Boat trip to view cliff sections. Overview of reef-rimmed platform architecture.
- Sa Pedrera Blanca. Shallow basin and forereef slope.
- Cap Blanc. Reef core and inner lagoon
- Cala Pi. Outer lagoon lithofacies
- Cala Llombards / Mirador des Pontas. Shallow water carbonates & subtidal stromatolites.
- Cala Figuera. Karst collapse structures.
- Core correlation and seismic interpretation exercises in the field.

AUDIENCE
Geoscientists and Earth Scientist Professionals who wish to gain a better understanding of reservoir heterogeneity.

PREREQUISITE
Basic understanding or background in Geology

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
This course integrates lecture-theory, outcrop observations and exercises, and the Petrel Structural and Fault Analysis module to improve interpretation and analysis of fault and trap geometry, fault zone processes, and trap and seal risks in exploration and development projects.

The main objective of this course is to use field exposures supplemented with classroom lectures and software exercises to train attendees on the methods and concepts on interpreting fault geometry and seal and associated risk to improve the interpretation of faulted traps in the subsurface.

COURSE CONTENT

- Enroute discuss the regional geological setting in the Piceance and Paradox basin and the Uncompahgre uplift for a regional overview.
  - STOP 1: Riverside stop to view stratigraphy.
  - STOP 2: Hittle Bottom to view regional tectonic maps and discuss well logs etc.
- General course overview, introduction, goals and outcomes.
- HSE discussion.
- Regional geological overview.
- Fault evolution and linkage (2hrs).
- Introduction to the SFA module in Petrel.
- Arches National Park – Normal fault styles and linkages, interpretation exercise, reservoir scale fault compartmentalization.
  - Stop 1: Regional overview on Potash road.
  - Stop 2: Overview of Moab Fault.
  - Stop 3: View point of Delicate Arch.
  - Stop 4: Delicate Arch relay – mapping exercise of normal fault geometry at Cache Valley relay ramp leading to Delicate Arch.
- Integrated Petrel exercise: Cache Valley relay.
- Geomodel construction and evaluation of Cache Valley relay ramp.
- Development or horizon and fault data into robust fault model suitable for structural analysis.
- Focus on fault evolution and structural styles including fault tip extension and the impact on cross-fault juxtapositions. Participants will be drawing on lectures and field exercise from Day 2.
- Fault seal theory and controls on flow including fault rock styles, permeability and capillary controls on flow, fault seal theory, analysis and prediction methods.
- Arches National Park.
  - Stop 1: Arches National Park.
  - Exercise of small faults in reservoir.
  - Overview of sub-seismic faults.
  - Discussion of fault zone processes in well exposed fault with clay and sand smear.
  - Stop 2: Moab anticline exercise.
- Group exercise mapping Moab Anticline prospect.
- Integrated exercise: Moab anticline.
- Geomodel construction and evaluation of the Moab anticline prospect mapped in field based exercise in Day 3.
- Evaluation of horizons and faults.
- Juxtaposition analysis and introduction to fault property analysis.
- Discussion on integrated exercise.
- Northern part of Moab Fault
- Map exercise of Moab Fault to review normal fault linkages and associated deformation.
- Discuss fault zone architecture.
- Discuss deformation in damage zones and small-scale faulting.
- Exercise reviewing juxtaposition triangle diagrams and fault zone characteristics.
  - Stop 1: Overview of Moab Fault.
  - Stop 2: Overview of relay ramp from distance.
  - Stop 3: Mapping breached relay.
- Integrated trap analysis and volume prediction.
- Completion of integrated exercises.
- Calibrated column height and seal capacity estimates.
- Applied seal analysis and prospect evaluation – identifying and risking fault windows, identifying fault spills and estimating fault sealing capacity.
- Basic volumetric estimate based on seal analysis.
- Group presentation on prospect selection, risking, seal capacity and volume estimate.
- Review and discussion of exercise and prospects.
- Final remarks and conclusions of course.
- Group meal in Moab.

AUDIENCE

The course is designed for exploration and production geologists, geophysicists and engineers working in seismic interpretation of faulted prospects in exploration and development plays.

PREREQUISITE

None

Field Trip: Depositional Environments from Slope Aprons to Tropical Reefs: Tabernas and Sorbas Basins, Spain

This 5-day field course offers attendees an extensive series of outcrop examinations, field-based correlation, reservoir description instruction, and exercises. The course aims to familiarize the attendee with the stratigraphy, shape, and scale of depositional bodies in small active Neogene basins. The value of sequence stratigraphic approaches, paleobathymetric analyses, and structural setting of the basin in predicting the large-scale character of the late Miocene deposits will be addressed in an appraisal and development context. The outcrop studies will illustrate the types of geological heterogeneities that occur in such sequences and show the geological processes responsible for these different hierarchical scales of variability. Relaxed team exercises at the outcrops will enhance knowledge transfer.

COURSE CONTENT

- Introduction to the Paleocene to Pleistocene infill of the basin
- Evaluate mass flow processes and deposits in the basalt succession
- View the transgressive systems tract on a seismic scale
Evaluate sheet-like turbidites
Assess a mass transport complex
Climb to the stratigraphic pinchout of the sheet-like turbidite system
Draw, walk through, and discuss a sediment delivery system
Assess sedimentary processes in a high N/G turbidite system
Map depositional architecture of scour lobes
View of seismic scale outcrop of Paleocene to Pliocene rocks
Introduction at the volcanic basement with sediment onlap
Interplay of volcanism and temperate water factory
Contrast temperate and tropical carbonate factories and their accumulations

COURSE CONTENT
- Attendees arrive in Grand Junction and meet at hotel meeting room in early afternoon.
- Introduction and course overview.
- Classroom lectures:
  - Fault interpretation and associated trap styles, linkages and geometry.
  - Basic contractional tectonics and associated structures.
  - Regional geology.
  - Safety lecture.
- Leave early in the morning and spend the day on a drive from Grand Junction to Moab with outcrop stops (basement involved deformation, regional geology).
  - Overviews to discuss regional geology.
  - Colorado National Monument: discussion of basement involved deformation.
  - Introduce team exercises and “prospect maps”.
  - Discuss style of deformation and potential fault seal behavior.
  - Introduce concepts of mechanical stratigraphy.
- Depart early to Arches National park and spend the day discussing and observing fault geometry and trap styles at range of scales and participating in team exercises.
- Afternoon drive into Onion Creek salt diapir for overview of salt controlled traps.
- Afternoon – teams meet to develop prospects with key risks and presentation of team exercises.
- Late morning: Drive to northern part of Moab Fault.
  - Regional overview of Moab Fault and linkages (seismic scale fault).
  - Discuss fault gouge/smear prediction in seismic scale faults.
  - Map hard-linkage of two seismic-scale faults.
  - Map along the fault discussing the linkages and relate to “prospect maps” discussing the associated risks.
- Evaluate the throws on fault, methods, and risks to evaluate.
  - Lecture (morning) and field (late morning):
  - Morning Lecture: Fault seal characterization and risk.
  - Late morning – outcrop exposure at entrance to Arches National Park for close-up of fault zone architecture across seismic fault.
    - Discussion of subseismic faults and association with larger structure.
  - Afternoon – teams meet to develop prospects with key risks and presentation of results.
  - Morning review of “prospects” and discussion.
  - Afternoon drive into Onion Creek salt diapir for overview of salt controlled traps.
    - Seismic exercise.
- Return to Grand Junction for team dinner

Field Trip: Late Palaeozoic-Early Mesozoic Sedimentation: SW Province, UK

Skill – 6 Days

This course focuses on typical facies types of desert, lacustrine (including playal), marine, fluvo-deltaic and submarine fan environments by comparing and contrasting the depositional processes on opposite sides of the Bristol Channel throughout the Carboniferous. A wide range of environments will be visited from Silurian to Lower Jurassic with a full range of sedimentary structures and soft-sediment deformations. One such locality, Ragwen Point, reputedly offers the best in the UK for illustrating the concepts of sequence stratigraphy. A comparison of the Crackington and Bude formations of Devon and Cornwall is always a source of controversy and usually leads to fascinating discussions in the field.

COURSE CONTENT
- Devonian Old Red Sandstone sequence
- Freshwater formation with pedogenic overprints
- Lower-coal measures with antrhacitc coals
- Storm-dominated Namurian Twrch sandstone disconformably overlying the Dinantian Oystermouth formation
- Contact between Upper Namurian and Lowermost Westphalian across the Gastrioceras subcrenatum marine band boundary
• Classic coarsening-up deltaic sequence incorporating the Amroth slump, culminating in the Lady Froriep coal seam
• Lower Westphalian coal measures containing ankeritic Amroth freshwater limestone, Kilgetty coal seam, siderite concretions, and liquefaction structures
• Wiseman’s Bridge: Multistory channel stack with possible tidal influence
• Saundersfoot: Stammers Veins (coal seams) and paleovalley fill
• Stepped unconformity between Triassic conglomerate and Dinantian limestones
• Upwards passage from conglomerate to Liassic marine Suttonstone
• Dunraven Bay: Blue Lias cliff outcrops
• Hypersaline lacustrine sediments with teepees and stromatolites of the Upper Triassic Mercia Mudstone (Keuper Marl) unconformably overlying Dinantian limestones
• Avon Gorge (and Burrington Combe if time permits) to view the entire Dinantian Limestone succession
• Turbidites, massive slumps/debris flows of the Namurian Crackington formation and abundant sole structures
• Depositional environment, depositional processes, and paleobathymetry
• Slide block and a massive slump and large sand volcanoes
• Cyclicity within deltaic deposits of the Namurian-Westphalian Bideford formation

AUDIENCE
Petroleum geologists, general geoscientists, sedimentologists, reservoir engineers, and structural geologists.

PREREQUISITE
None

Field Trip: Foreland Basin Syntectonic Sedimentation: Southern Pyrenees, Spain

Skill – 4 Days

This course will cover the evolution from continental through shallow marine to slope and submarine fan sedimentation during formation of a foreland basin with syntectonic sedimentation in adjacent, but sequential subbasins associated with evolving thrust fronts during the Pyrenean orogeny. Starting and finishing in Barcelona, the Upper Paleocene-Lower Eocene Ager basin, the Eocene Tremp-Grauss, and Ainsa basins, the Upper Eocene-Oligocene Jaco basin, and finally the Oligo-Miocene Ebro basin will be visited. Impressive panoramic views of the various sedimentary sequences will be observed and show large-scale tectonic elements that controlled the sedimentation are evident. The clastic-dominated sequences essentially record the westward-deepening and progressively marine influenced foreland basin evolving as the Pyrenean range developed from Eocene onwards, although the more southerly and younger Ebro basin succession is spectacularly dominated by alluvial fan and fluvial sediments. The course bases consist of Barcelona, Tremp, Grauss, Ainsa, Broto, and Barcelona.

COURSE CONTENT
• Ager basin-fill sediments in a foothwall syncline
• Syntectonic unconformity
• Incision and fluvial Castisent sandstone
• Meandering stream point bar deposits
• Large-scale tidal cross-bedded Alveolina limestone
• Oyster-bearing estuarine sediments with tidal channel erosion
• Back-shelf alluvial fan conglomerates with southern provenance
• Incised valley deposits

• Thrust sheet created by inversion and view stop of Castisent sandstone
• Stacked coarsening-up, storm-dominated marine shoreface sediments of Santa Liestra formation
• Slope sediment collapse; slide block
• Ainsa: channelled turbidites
• Boltana anticline
• Thin basin plain calc-turbidites and mega bed turbidites (>=200-m thick)
• Slump/olistostrome and inverted mega bed turbidite
• Alluvial fan conglomerates associated with emergent thrust front
• Medial basin, low-sinuosity fluvial sheet and ribbon sands spectacularly exposed in canal cuts

AUDIENCE
Petroleum geologists, geophysicists, reservoir engineers, sedimentologists, and stratigraphers.

PREREQUISITE
None

Field Trip: Oligo-Miocene Carbonate Sedimentary Models of Malta – Analogues for Cenozoic Reservoirs Worldwide

Skill – 6 Days

The course introduces the attendees to carbonate sedimentology and sequence stratigraphy through lectures and using the excellent Oligocene and Miocene limestone outcrops of Malta and its sister island, Gozo. Excellent exposures of systems tracts across depositional models of both carbonate-rimmed platforms and a carbonate ramp illustrate the principles of sequence stratigraphy on Malta. Additional interest arises from the overprints of synsedimentary tectonics associated with rifting, plus spectacular karstic collapse structures. These exposures provide a general training ground for carbonate rocks as well as very good analogues for Cenozoic reservoirs (e.g., SE Asia and the Gulf of Suez). This course is based in Sliema, Malta.

COURSE CONTENT
• Carbonate grains, carbonate accumulation processes and carbonate factories, depositional environments, facies and facies models
• Rimmed carbonate platforms and carbonate ramps
• Ramp carbonate facies and facies models
• Transect from inner, to mid, to outer ramp facies belts and discussion of facies models for ramp sedimentation
• Correlation of field sketch logs from inner to outer ramp and construction of facies model
• Principles of carbonate sequence stratigraphy using outcrop and seismic data
• Classification of carbonate platforms
• Shelf and pelagic limestones, synsedimentary tectonics, karstic dissolution features, and calcrites
• Exceptional transgressive section from inner ramp to pelagic carbonate facies; omission and flooding surfaces; lateral facies and thickness changes related to fault-block rotation
• Karst dissolution structures (Miocene blue holes)
• Subaerial exposure surface calcrites
• Contrasting carbonate factories and porosity evolution
• Various carbonate factories (Heterozoan and Photozoan) generating different facies, stratigraphic geometries, and pore systems that have important controls on reservoir quality
• Carbonate depositional sequences, sequence boundaries, and slope deposits on a rifted platform margin
• Shelf carbonate facies in two depositional sequences subsequently dissected by the Malta Graben leading to diverse carbonate slope facies

**AUDIENCE**
Petroleum geologists, general geologists, sedimentologists, reservoir modellers, reservoir engineers, and petrophysicists.

**PREREQUISITE**
None

### Field Trip: Fluvial and Deltaic Architecture and Advanced Modeling using Petrel: Utah/Colorado, USA

**Skill – 7 Days**

This field and classroom-based reservoir geology and modeling course covers applied techniques for reservoir geocellular modeling. The course teaches attendees novel and practical methods to build realistic models of fluvial and deltaic sediment body architecture, demonstrated using the Petrel platform. The attendees will use the Petrel software to integrate core and well log data in a series of deterministic model exercises. The results are compared with other traditional Petrel platform modeling techniques and each is then evaluated against outcrop reality to determine which techniques are the most suitable for analogous subsurface reservoir modeling studies. The course follows the typical workflow of a subsurface 3D modeling study and is aimed at making a series of realistic predictive models of reservoir geometry and architecture using detailed knowledge of sedimentology and sequence stratigraphic concepts. This course blends lectures, modeling exercises, and over 10 field trips to sites in Grand Junction, Colorado and Green River, Utah. A full day-by-day agenda can be found at NExTtraining.net.

**COURSE CONTENT**
- Diagnostic outcrop, core, and log interpretation of fluvio-deltaic environments and facies
- Core, log and reservoir properties integration to define flow units
- Conceptual models and sequence stratigraphic framework building for reservoir modeling
- Well data correlation techniques
- Deterministic modeling techniques
- Hierarchy, zone logs, and layering applications
- Different modeling techniques and implications comparison for static connectivity

**AUDIENCE**
Geologists and reservoir modelers.

**PREREQUISITE**
Petrel Fundamentals course or minimum 3 months of Petrel use.

### Field Trip: Practical Fracture Analysis of Classic Reservoirs with Petrel: Casper, Wyoming, USA

**Skill – 5 Days**

This 5-day course combines field and classroom training sessions that integrate model building using the Petrel platform with classical field observations. The field trip portion of the course will consist of short excursions to view the oilfield facilities, surface geology, and outcrops in the area as well as time spent viewing core. This course provides the geoscience professional with tangible examples of the conceptual models they create. The classroom portion of the course is a 2-day hands-on Petrel platform fracture modeling course delivered in a classroom facility in Casper, Wyoming, in cooperation with the staff at the Rocky Mountain Oil Testing Center (RMOTC). The RMOTC is a 10,000-acre U.S. Department of Energy facility located within the Naval Petroleum Reserve No. 3 (NPR-3), also known as Teapot Dome Oil Field, roughly 25 miles north of Casper where the data used in the Petrel platform fracture modeling course was collected.

**COURSE CONTENT**
- Introduction at RMOTC office
- Field site trip and short field exercises
- Core lecture, visit OMNI Laboratories, and exercise involving three Teapot Dome Tensleep cores, standard wireline and FMI* fullbore formation microimager logs, detailed core descriptions and correlations
- Visit Alcova Lake field Location, box lunch, lecture, exercises
- Visit Tensleep of Fremont Canyon
- Petrel platform fracture modeling, fracture theory, fracture data analysis and QC
- Build a discrete fracture network (DFN), upsampling, building DFN using multiple frac drivers, dual porosity/permeability simulation
- Finalize models built in the Petrel platform, presentation of results and roundtable discussion
- Visit Emigrant Gap anticline and Bessemer anticline

**AUDIENCE**
Geoscientists, engineers, and Petrel modelers.

**PREREQUISITE**
Must have working Petrel knowledge.

**NOTE:** Please schedule your departing flight after 3 p.m. on Saturday. Participants must arrive in Denver, Colorado no later than noon on Sunday.

### Field Trip: Arid Coastline Carbonates and Evaporites of Abu Dhabi, UAE

**Skill – 5 Days**

This course will demonstrate how a range of depositional, diagenetic, and erosional processes combine to create a complex stratigraphic architecture with a subsurface that could be difficult to interpret. Join trip leader Dr. Anthony Kirkham, in studying the recent, Holocene, Pleistocene, and Miocene carbonate and sabkha evaporite environments of central and western Abu Dhabi, one of the world’s best locations for studying such sediments. This trip’s destination is an outdoor laboratory in which attendees are given the opportunity to study geologically modern sequence stratigraphy in a proximal-ramp situation with complete exposure of the sediments and rocks.

Learning how these processes interact in real life will provide valuable insight for the geologist who is faced with limited exploration or development data and is in need of constructing 3D models.

**COURSE CONTENT**
- Recent carbonate sediments
- Interdelta coral reef systems; lagoonal communities including coral thickets, red algae, sea grass, burrowing, and encrusting bivalves
- Pleistocene aeolianite, storm beach, and other enigmatic limestones
- Coastal sabkha sequence: subtidal, intertidal and supratidal sediments with evaporites and microbial mats
- Transgressive and regressive carbonates
- Salina deposits
- Origins of sabkhas
- Aeolian carbonate dunes and deflation
- Tidal channels and levees
- Anhydrite distributions

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Field Trip: Peruvian Basin Floor Fan Systems of Karoo, South Africa

Skill – 6 Days

This course will help attendees understand the lithofacies and architectural relationships of the Peruvian basin floor fan system in the Tanqua Karoo area (western Cape, South Africa) from outcrops, cores, and logs. This area contains some of the world’s best basin floor fan exposures. This region has been the topic of a European-sponsored research project in which a large amount of outcrop data have been acquired and seven research boreholes were drilled, cored, and logged with state-of-the-art logging suites. These data and the important results of the project will be shared with the attendees. Hiking over the succession from the basinal fans across the shelf edge to the prodelta deposits is a highlight of the course. The course base is the Inverdoorn Game Lodge.

COURSE CONTENT

- Overview of Western basin margin and its development
- Channel geometries, levees, collapse structures, paleoflow relationships, and thin-bedded overbank deposits
- Study internal architecture, sedimentary structures, and Fan 3 sheet sands
- Lobe architecture, beds-elements-lobe associations, local channelization, and linked debrites
- Inverdoorn core workshop, logs and borehole images, and comparison with outcrops
- Using well data and outcrop analogues for reservoir modeling
- New information from cores/logs not observed in outcrops
- Hike entire sedimentary succession from basin floor fans to slope deposits, shelf edge transition, and prodelta deposits

AUDIENCE

Geologists and petroleum geologists wanting to understand carbonate and evaporite environments and how field outcrops relate to recorded data.

PREREQUISITE

None

Field Trip: Characterization and Petrel 3D Modeling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous: East Kentucky, USA

Skill – 5 Days

This course is a field and classroom-based reservoir characterization and modeling course that focuses on capturing the geological knowledge necessary to build realistic models of coal-bearing fluvial and deltaic sediment body architecture using the Petrel platform. The course, based in Lexington and Prestonsburg, Kentucky, follows the typical workflow of a subsurface 3D modeling study and is aimed at fluvio-deltaic reservoir characterization and making realistic predictive models of sedimentary geometries and architecture by incorporating detailed knowledge of sedimentology and sequence stratigraphic concepts.

Outcrops, cores and well logs are studied to characterize both small- and large-scale patterns of sedimentary architecture within a sequence framework in these carboniferous coal-bearing fluvio-deltaic sediments.

COURSE CONTENT

- Evaluate outcrop, core, and log interpretation of coal-bearing fluvio-deltaic environments and facies
- Build a sequence stratigraphic framework in coal-bearing sediments for reservoir modeling
- Study coal and coal-bearing sediment correlation techniques from well data
- Develop deterministic modeling techniques for coal-bearing sediments, horizons, zones, and layering using Petrel platform software
- Develop and apply isochores to control sediment body shapes
- Compare modeling results from different Petrel platform techniques
- Analyze static connectivity of different facies modeling techniques

AUDIENCE

Geoscientists interested in characterizing and realistically modeling sedimentary architecture to support hydrocarbon, coal-bed methane or coal extraction.

PREREQUISITE

Working knowledge of Petrel platform software is necessary to obtain the maximum benefit from the class.

Introduction to Geology Including Day Pyrenees Field Trip

Awareness – 5 Days

This 5-day course, including a 1-day field trip to the Pyrenees, introduces E&P professionals from nongeology disciplines to key geological concepts and principles for use in the oil and gas industry. The course summarizes geology fundamentals required for petroleum exploration, development, and production. This course is an offshoot of the 4-day Introduction to Geology course.

COURSE CONTENT

- Geology fundamentals required in petroleum exploration, development, and production
- 1-day field trip requiring a moderate amount of walking and low-incline climbing

AUDIENCE

Entry level-to-midlevel engineers, geoscientists, and other E&P staff who need an understanding of the role Geology plays in their everyday business activities.

PREREQUISITE

None
Introduction to Geology with OilSim and Pyrenees Fieldtrip

**Foundation – 5 Days**

This 5-day course will cover the key concepts and principles of geology as applied to the oil and gas industry, summarize the fundamentals of geology to integrate it in the processes of petroleum exploration, development, and production. Using the OilSim upstream learning simulator modules, attendees will experience the essentials of basin exploration, drilling location evaluation from a geological perspective, and some of the business aspects of getting their first well drilled.

**COURSE CONTENT**

- Introduction (course objectives, history and economics of petroleum, Prudhoe Bay example)
- Geology (principles, Earth structure and plate tectonics, geological time and age dating, major rock types)
- Structural features (structural style and stress fields; folds, faults, unconformities, and fractures; structural and hydrocarbon traps)
- Clastic depositional systems
- Carbonate depositional systems
- Carbonate and clastic systems contrasts
- Geologic mapping and cross sections
- Mapping and contouring concepts
- The petroleum system
- Correlation and stratigraphy
- Principles of correlation (use of wireline logs, approaches, lithostratigraphy and chronostratigraphy, sequence stratigraphy, and seismic stratigraphy & biostratigraphy)
- Pore systems and diagenesis
- Geological modeling
- Unconventional Resources
- Seismic methods and petroleum geology
- Basics of wireline logging and interpretation
- Exploration challenges: exploring sedimentary basins, obtaining a license, partnerships and farm-ins
- 1-day field trip requiring a moderate amount of walking and low-incline climbing

**AUDIENCE**

Entry level to mid-level engineers, geoscientists, and other E&P staff with a need to understand the role geology plays in their everyday business activities

**PREREQUISITE**

None

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Structural Geology for Petroleum Applications

**Foundation – 9 Hours**

This course is delivered in 3 hour segments over 3 days. The course is delivered by virtual means using Skype for Business. This Virtual Classroom has been designed to familiarize class participants with the fundamentals of Structural Geology, as used and required in and for the Oil & Gas Industry. Structural Geology is defined as “The discipline within the science of Geology that relates to rock unit geometry and the deformational histories that produced those geometries.”

**COURSE CONTENT**

- Forces - Stress and strain
- Tectonics - Extensional, Compressional, Strike-Slip
- Scale - Regional to Microscopic
- Ductile Deformation - Folding
- Brittle Deformation - Faulting
- Brittle Deformation - Fracturing
- Seismic Interpretation of Structure
- Structural Interpretation of Borehole Images
- Surface Representation of Structure

**AUDIENCE**

Geoscientists in the Oil & Gas Industry who need a fundamental understanding of the contributions and effects of structure.

**PREREQUISITE**

None
Geophysics

NExT's curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked , while technical courses that use software have been marked , and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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<td>Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements</td>
<td>ADVANCED</td>
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<tr>
<td>Deepwater Seismic Interpretation</td>
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<td></td>
<td>WinGlLink for Analysis and Inversion of Magnetotelluric, EM, Gravity and Magnetic Data</td>
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<td>Microseismic Processing, Interpretation, and Applications</td>
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<tr>
<td>Borehole Seismic Acquisition, Processing and Operations</td>
<td></td>
<td>Practical Seismic Attributes with Petrel</td>
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<tr>
<td>Land Seismic Acquisition Techniques and Survey Design</td>
<td>Practical Marine Seismic Time Processing with Omega</td>
<td>Practical AVO and Seismic Inversion with Petrel</td>
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<tr>
<td>Marine Seismic Acquisition Techniques and Survey Design</td>
<td>Practical Land Seismic Processing with Omega</td>
<td>Practical Seismic Interpretation with Petrel</td>
<td>Seismic Petrophysics and Rock Properties</td>
<td>SKILL</td>
</tr>
<tr>
<td>Seismic Survey Design using OMNI 3D® V2014</td>
<td>Introduction to Depth Imaging with Omega</td>
<td>Seismic Structural Interpretation</td>
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<td>Practical Depth Conversion with Petrel</td>
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<td>Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics</td>
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<td>Practical Depth Conversion and Depth Imaging for the Interpreter</td>
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<td>Seismic Stratigraphy</td>
<td>AVO and Seismic inversion</td>
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<td>Seismic Acquisition and Processing</td>
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<td>Petrel Geophysics</td>
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<tr>
<td>Fundamentals of Omega Seismic Processing System</td>
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<td>Seismic Processing for Interpreters and Others</td>
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<td>Borehole Seismic Technology</td>
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<td>Non-Seismic Geophysical Methods</td>
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<td>Introduction to Geophysics with OiLSim</td>
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### Geophysics

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<td>Petrel</td>
<td>Techlog</td>
<td>Omega / OMNI</td>
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<tr>
<td></td>
<td>Petrel Quantitative Interpretation</td>
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<td>Practical Marine Seismic Time Processing with Omega</td>
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<tr>
<td></td>
<td>Petrel Geophysics: Seismic Interpretation Workflow Tools</td>
<td>Introduction to Depth Imaging with Omega</td>
<td>Seismic Survey Design using OMNI 3D® V2014</td>
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<td>Petrel Prestack Seismic Interpretation</td>
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<td>Petrel Seismic Well Tie</td>
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<td>Petrel Workflow Editor and Uncertainty Analysis</td>
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<tr>
<td><strong>FOUNDATION</strong></td>
<td>Studio for Petrel Users</td>
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<td><strong>AWARENESS</strong></td>
<td>Working with time-depth data in Petrel</td>
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Rock Physics: Integrating Petrophysical, Geomechanical, and Seismic Measurements

Advanced – 5 Days

This 5-day course is designed to increase attendees’ understanding of the sensitivity of elastic waves in the earth to mineralogy, porosity, pore shapes, pore fluids, pore pressures, stresses, and the anisotropy of the rock fabric resulting from the depositional and stress history of the rock and how to use this understanding in quantitative interpretation of seismic data and in the construction of mechanical earth models. A variety of applications and real data examples is presented.

COURSE CONTENT

- Introduction rock physics and petrophysics
- Hooke’s law, anisotropy, and elastic wave velocities
- Sedimentary rocks as heterogeneous media
- Representative elementary volume (REV) and effective elastic properties
- Voigt/Reuss and Hashin-Shtrikman bounds
- Modulus-porosity relations for clean sands
- Critical porosity and mechanical percolation
- Gassmann’s equations and fluid substitution
- Fluid properties and mixtures
- Diagenetic and sorting trends in velocity-porosity data
- Velocity-porosity models for shaly sands
- Empirical relations between velocity and porosity, clay content, etc.
- Properties of sand-clay mixtures
- Velocity-porosity relations for shales
- Relations between VP and VS
- Rock compressibilities and relation of 4D seismic to well testing
- Reflection coefficients and AVO
- Elastic impedance
- Rock physics templates
- Effective medium and effective field theories
- Velocity-porosity relations for carbonates
- Biotheory
- Patchy saturation
- Squirt flow
- Sediment compaction and the state of stress in the Earth
- Pore pressure and the concept of effective stress
- Poroelasticity
- Application to pore pressure prediction
- Fracture gradient and 3D stress modeling
- Effect of stress on seismic body waves
- Third-order elasticity
- Granular media and discrete element methods
- Displacement discontinuity methods
- Stress sensitivity of sandstones
- Stress sensitivity of shales
- Stress perturbations around a borehole
- Determination of velocity variations around a borehole from advanced sonic logging
- Application to wellbore stability
- Reservoir geomechanics and stress effects in 4D seismic monitoring
- Fractured reservoirs
- Hydraulic fracture propagation in presence of natural fractures
- Seismic characterization of fractured reservoirs
- Modeling the response of a fractured reservoir
- Rock physics models for fractures
- Shales and unconventional reservoirs
- Anisotropy of shales
- Rock physics modeling of kerogen in organic-rich shales
- Effect of anisotropy on AVO
- Microseismic and effect of azimuthal anisotropy on propagation of hydraulic fractures

AUDIENCE

Geoscientists, petrophysicists, and engineers with a need to understand rock physics and learn how to work together in integrated teams to build geomechanical models.

PREREQUISITE

Basic knowledge of geology, geophysics, and petrophysics.

Integrated Nonseismic and Seismic Methodologies for Geoscientists

Advanced – 5 Days

This 5-day integrated course introduces geoscientists to the physical concept of each electromagnetic, potential field, and seismic measurement to illustrate the added value of integrated methodologies for a better understanding of specific geologic targets in both marine and land environments. This course objective is to introduce the IEM plug-in features on Petrel 2013 for magnetotelluric and controlled source electromagnetic data, surface and refraction seismic data viewing and editing, resistivity, Vs, Vp model property and forward modeling, and inversion workflow.

Course structure: electromagnetic method (physics, data acquisition, processing and interpretation, practice), potential field method (physics, data acquisition, processing and interpretation), seismic waves (physics, data acquisition, processing and interpretation, practice), simultaneous joint inversion (concept and practice)

COURSE CONTENT

- Electromagnetic method: magnetotelluric (MT) data physics, data acquisition and field processing, data visualization and editing, data inversion and interpretation
- Electromagnetic method - controlled source EM (CSEM) physics, data acquisition and field processing, data visualization and editing, data inversion and interpretation
- Potential field method
- Physics of gravity, full-tensor gravity gradiometry, and magnetic data
- Gravity data acquisition and field processing
- Gravity data inversion and interpretation
- Surface wave and refraction wave
- Physics of surface and refraction seismic wave
- Surface wave data analysis

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Deepwater Seismic Interpretation

Advanced – 5 Days

This course focuses on the interpretation of seismic data and the delicate construction of seismic maps in the deepwater realm, with emphasis on proximal, intermediate, and distal marine reservoirs. Attendees will learn how acquisition and processing of 2D and 3D data relate to the practical use of the extensive and growing deepwater databases in addition to studying seismic velocities, depth conversion, comparisons of 2D and 3D data, and the principles of 4D and 4C seismicity. This knowledge will improve their understanding of how 3D dataset time slices and amplitude and phase attributes can be applied for better reservoir characterizations. Complete hands-on mapping problems and exercises are included that explore geophysical exploration and development mapping in deepwater areas.

COURSE CONTENT
- Seismic interpretation concepts, acquisition, and processing workflows
- Deepwater petroleum geology provinces and world distribution of deepwater basins
- Exploration and production in deepwater
- Seismic stratigraphic mapping in deep and ultradeepwater
- Deepwater reservoir stratigraphy, turbidites and mapping techniques
- Time and depth map contouring in deepwater
- Seismic velocities: Average, interval, NMO, rms, and Dix equation
- Depth conversion techniques and precision: PSTM and PSDM
- Deepwater reservoir interpretation techniques
- Comparative interpretation of poststack and prestack time migration and interpretation
- Deepwater prospects ricks and project economics

AUDIENCE
Geoscientists, geophysicists, and engineers wanting a better understanding seismic interpretation in deepwater environments.

PREREQUISITE
Intermediate understanding and experience of seismic interpretation techniques.

WinGLink for Analysis and Inversion of Magnetotelluric, EM, Gravity, and Magnetic Data

Advanced – 3 Day

This 3-day course presents the workflows for analysis and inversion of magnetotelluric, time domain EM, gravity, and magnetic data. The workflows focus on the data visualization and editing, the construction of map attributes, model building, and inversion. Attendees will learn how to create projects, analyze the data, build a model, and do inversion of MT, TDEM, gravity, or magnetic data. The course will guide participants through the diverse WinGLink modules including maps, soundings, pseudosections, X-sections, 2D inversion, and 3D modeling.

The class illustrates how the WinGLink application is used, taking diverse datasets for each discipline workflow.

COURSE CONTENT
- WinGLink workflows
- TDEM soundings, static shift, and correction by TDEM data
- MT 2D workflow: model building, inversion and modeling, maps and X-sections
- MT 3D workflow: Inversion
- Gravity maps and magnetic maps
- Gravity 2.75D modeling and magnetic 2.75D modeling

Microseismic Processing, Interpretation, and Applications

Foundation – 5 Days

This 5-day course is an introduction to microseismic qualitative interpretation methods, using theory, publications, examples, and case studies to illustrate the objectives of microseismic monitoring projects. Case studies demonstrate the importance of microseismic event properties in interpretations and how they can be correlated to fracture treatment data. The examples show how microseismic data can be used in a variety of common project objectives and limitations to such interpretations.

COURSE CONTENT
- Introduction to microseismic interpretation, quality assurance of events data, and qualitative interpretation methods
- Sources of microseismic events during fracturing, failure mechanisms, source parameters and source wave radiation patterns
- Introduction to microseismic monitoring and fundamentals
- Data integration and interpretation applications

AUDIENCE
Geoscientists

PREREQUISITE
Fundamentals of geophysics and a good understanding of the seismic theory and application

Borehole Seismic Acquisition, Processing, and Operations

Skill – 5 Days

This course presents an overview of all aspects of borehole seismic acquisition, operations, and processing techniques. Practical exercises are conducted using a test well at the Schlumberger Training Centre in Aberdeen using Schlumberger wireline borehole seismic equipment. The practical exercises will consist of running the VS1* versatile seismic imager with up to 4 x 3 component receivers in a 772-ft deep well and acquire VSP data using an airgun source (Run 1), which will be a 3
x 150-cu. in. G-Gun cluster (a typical offshore source) deployed in a 5-m diameter, 5-m deep purpose-built gun pit and operated with the TRISOR Insea source controller. For Run 2 the VSP will be acquired using a vibrator as the energy source. The Vibrator is a Mertz M-18HD Vibrator buggy operated with the Pelton VibPro controllers. Schlumberger’s VSI imager acquisition software (workbench) will be used for Runs 1 and 2, and all QC features of the software will be used and shown to ensure data quality optimization. The participants are encouraged to assist with the rigging up/down of all equipment, wireline winch driving, and data acquisition.

**COURSE CONTENT**

- Basic well seismic principles and applications
- VSP acquisition examples
- Borehole seismic acquisition and tools
- VSP acquisition airgun
- VSP acquisition vibrator
- Quality control
- Borehole seismic modeling
- Borehole seismic data processing
- Advanced operations
- Advanced conveyance
- Advanced processing

**AUDIENCE**
Geologists and geophysicists having the need to understand the acquisition, principles, uses, and applications of borehole seismic data.

**PREREQUISITE**
Basic understanding of geology and geophysical methods.

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**Practical Seismic Attributes with Petrel**

**Skill – 3 Days**

This course will present the practical aspects of generating and understanding seismic attribute responses and relating these from the mathematical geophysical generation to practical geological understanding and application. The course will focus on outlining the use of seismic attributes in specific geological environments and identifying specific geological features. The course philosophy is that learning is an active experience; apply understanding over memorization; provide fundamentals for growth; and provide skills for application. The learning objectives for the course include teaching the theory of seismic attributes, the practice of seismic attributes, seismic attributes using the Petrel platform, and prepare the attendants for using seismic attributes in their work.

**COURSE CONTENT**

- Theory of seismic attributes
- Seismic attributes in the Petrel platform
- Colors and visualization of attributes
- Surface attributes in the Petrel platform
- Geological scenarios and the applications of attributes
- Noise reduction
- Stratigraphic applications
- Channels and fluvial systems
- Geological scenarios and the applications of attributes
- Formation orientation
- Lithology indicators
- Textural attributes
- Structural attributes
- Edge detection
- Fracture indicators
- Carbonates and Salt
- Direct hydrocarbon indicators
- Create seismic attributes using the seismic calculator
- Seismic attribute workflows and best practices
- Getting help
- Thoughts for the future
- Group project

**AUDIENCE**
Geoscientists interpreting seismic data volumes.

**PREREQUISITE**
Petrel Fundamentals course is required and the Petrel Geophysics course is recommended.

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**Land Seismic Acquisition Techniques and Survey Design**

**Skill – 5 Days**

The course is designed to familiarize the student with the basics of 3D Land seismic acquisition before moving on to cover the more recent developments: broadband techniques (boosting the low and high frequencies), simultaneous source – high productivity vibroseis, single sensor and source, groundroll inversion and 3C acquisition. Learning is supported through numerous case histories that illustrate the value of each acquisition technique. Central to the success of these techniques is how the surveys are designed to deliver fit-for-purpose data in a cost-effective manner.

**COURSE CONTENT**

- Land Seismic Acquisition
- Overview of course content & learning objectives
- Introduction to land data acquisition
- 2D and 3D acquisition geometries
- Land Seismic Acquisition
- Simultaneous source - hi-productivity vibroseis
- Broadband, single sensor, single source (vs arrays)
- Coherent noise - sampling & filtering
- Groundroll inversion (SWAMI) and 3C
- Block design spreadsheet exercise; productivity spreadsheet exercise.
- Survey Design
- Objectives and methods of land survey design
- Resolution and sampling
- Modeling, using a 1D earth model, to determine offset/angle limits, muting, bin size, fold and migration aperture
- Resolution spreadsheet exercise;
- Survey Design
- Designing a 3D acquisition geometry
- Seismic sources and modeling
- Modeling using a 3D earth model for subsurface coverage
- Relation between acquisition geometry and imaging - 3D symmetric sampling
- SED case study example
**IMMERSIVE LEARNING PROGRAMS**

**COMPETENCY MANAGEMENT**

- Survey Design
- AVO, pre-stack inversion and AVOAz
- Processing considerations: multiples, 4D
- New interpolation technology & non-uniform survey design
- Presentation of team survey designs, OMNI exercises.
- Review of course objectives and feedback

**AUDIENCE**

Geophysicists with limited experience of seismic acquisition, or more experienced staff including Interpreters and Operational Geophysicists who need to keep up with the rapidly developing field of modern seismic acquisition techniques.

**PREREQUISITE**

Foundation level Seismic Acquisition and Processing or equivalent practical experience of land seismic acquisition operations.

**Practical Marine Seismic Time Processing with Omega**

**Skill – 5 Days**

This 5-day course is designed to increase knowledge and understanding of how to use the Omega software platform processing package to process marine 3D seismic datasets through a basic time-processing sequence. It will include parameter testing from example flows and how to convert these into production flows. The use of the interactive velocity analysis application (InVA) will be covered to pick a migration velocity field.

Participants will learn the appropriate QC for each step of the processing sequence and how to sort data to different domains.

**COURSE CONTENT**

- Marine data reformat, including noise attenuation workflows, linear and swell noise, and wavelet processing
- Demultiple techniques, including generalized surface multiple prediction (GSMP) and weighted least squares (WLS) radon.
- Regularization and velocity picking
- Vertical and horizontal QC of the picked velocities and the use of mute overlays to visualize the stretch mute on the gathers.
- Migration
- Mutes
- Final stack
- Class review

**AUDIENCE**

Individuals with a need to know how to use Omega geophysical data processing platform to process marine seismic data

**PREREQUISITE**

Understanding of seismic data processing and common data processing concepts and challenges and Fundamentals of Omega course for those with no knowledge of the Omega platform.

**Practical AVO and Seismic Inversion with Petrel**

**Skill – 5 Days**

A profitable development of an oil or gas field starts with a good understanding of the subsurface as a basis for efficient and successful field management. The integration of AVO and inversion techniques in Quantitative Interpretation helps to create the best possible petrophysics subsurface model. Improved discrimination of reservoir units are made and models are generated using logs and seismic data. These techniques lead to highly accurate or highly probable (static) subsurface models compatible (if correctly up-scaled) to dynamic reservoir models obtained from reservoir engineering measurements and computations.

**COURSE CONTENT**

- Introduction and Seismic Processing for AVO and inversion
- AVO Theory
- Inversion Theory and Methods
- Well to seismic ties and wavelets
- Low frequency model building
- Practical applications of seismic inversion - including lithology discrimination and rock physics inversion.
- 4D and 3C Inversion
- Stochastic Inversion
- Future directions

**AUDIENCE**

E&P managers, geoscientists, and reservoir engineers involved in seismic interpretation or working with results of seismic data interpretation.

**PREREQUISITE**

Basic or intermediate seismic interpretation knowledge.

**Marine Seismic Acquisition Techniques and Survey Design**

**Skill – 5 Days**

This 5-day course is covers the latest developments in conventional 3D marine-towed streamer seismic acquisition, wide-azimuth towed streamer, broadband techniques (boosting the high and low frequencies), seabed receivers for both P-wave and converted-wave, recording, time-lapse surveys, and the emerging technology of simultaneous source acquisition. Learning is supported through case histories that illustrate the value of each acquisition technique. The second half of the course covers the principles of survey design, supported by hands-on practice with participants working together to design solutions to typical survey objectives and challenges. At the end of the course, participants will have knowledge of all current and emerging marine seismic acquisition technology and techniques, the principles and workflows employed to design marine seismic surveys, how to make an early assessment of whether a proposed survey design will be successful, and how and what to recommend for further areas of investigation.

**COURSE CONTENT**

- Marine seismic acquisition, wide-azimuth towed streamer seismic acquisition, seabed seismic acquisition
- Marine seismic acquisition, broadband acquisition, time-lapse acquisition, simultaneous source acquisition
- Survey design objectives and methods, earth model building, and resolution and sampling
- Survey design: 1D earth modeling, 3D acquisition geometry design, seismic sources, and modeling, and modeling using a 3D earth model for subsurface coverage; and 3D ray tracing and wave-equation illumination modeling
- Survey design logistics and efficiency in the field, choosing the shooting area and shooting direction, finalizing survey design exercises, presentation of team survey designs, and review

**AUDIENCE**

Geophysicists with limited experience in seismic acquisition, experienced interpreters and operational geophysicists with a need to stay up to date on the rapidly developing field of modern seismic acquisition techniques

**PREREQUISITE**

Entry level seismic acquisition and processing or equivalent practical experience of marine seismic acquisition operations.
Introduction to Depth Imaging with Omega

Skill – 10 Days

This 10-day course covers the most common workflows involved in processing a 3D dataset through a depth imaging sequence so that attendees can build, modify, and QC velocity models in SVM (including anisotropy); run and QC tomographic updates of these models; prepare data and models for Kirchhoff pre-stack migration; and run, test, and parameterize Kirchhoff prestack migration using these models.

COURSE CONTENT

- Introduction to Omega data processing platform
- Use of Petrel & SVM software platform
- Petrel import/export for seismic velocity modeling (SVM) plug-in
- SVM initial model building (ISO)
- Kirchhoff Depth Migration in Omega (ISO, TTI)
- CIP picking using Omega data processing platform
- Dip and azimuth estimation
- Tomography using Omega data processing platform
- Depth imaging RMO QC tools
- Omega platform workflow
- Volumetric RMO QC using Petrel platform workflow
- Tomography tools
- Use of the prestack seismic interpretation (PSI) plug-in
- Localized CIP Picking in Petrel
- Seiscal kit in Petrel platform
- SVM anisotropic model building (TTI)
- Use of the map migration plug-in

AUDIENCE

Geophysicists with a need to use Omega and Petrel platforms to run depth imaging workflows.

PREREQUISITES

Mandatory competency using Omega software platform, preferred competency using Petrel software platform, and required understanding of the concepts underlying time seismic data processing and common depth processing challenges. This class needs to be taken in conjunction with the Seismic Velocity Modeling class to understand how to derive viable models suitable for depth processing.

Practical Seismic Interpretation with the Petrel

Skill – 5 Days

This course provides E&P professionals with seismic data visualization, integration, and interpretation techniques that have been recently developed. The attendees will gain a solid understanding of the applications and role of the seismic interpreter in studies that involve poststack seismic attributes, AVO, seismic sequence stratigraphy, seismic geomorphology, 4D time-lapse seismic, and multidisciplinary integration. Recent and relevant case histories, data examples, and exercises, conducted both on paper, and with the Petrel platform, will guide the attendees in understanding that the integration of all available data into the seismic model adds value in the required coherent and successful seismic predictions that result from an interpretation.

COURSE CONTENT

- Introduction and general overview
- Fundamentals of signal theory, wavelet, resolution, and scaling
- Geological concepts, sedimentary models, and structural styles

Seismic Petrophysics and Rock Properties

Skill – 5 Days

Seismic petrophysics involves the study and application of well log data, and rock physics theory and data to the interpretation of seismic data and observations. In this course, attendees will gain an understanding of rock physics data and theory, integrate these data with that from well logs in a petrophysical evaluation, and then use the results to model and interpret seismic data.

Moving progressively, attendees begin with simple, commonly used models and continually expand them to include increasingly complicated and realistic interpretations. At each step, the attendees investigate the relationships between theory and laboratory, well log, and seismic data. Course material includes spreadsheets that incorporate many of the studied models (predicting fluid properties, rock properties, and seismic response including AVO and elastic impedance). Exercises on rock types drawn from around the world are based on these spreadsheets and require simple calculations.

COURSE CONTENT

- Fundamentals of seismic petrophysics
- Seismic attributes and their relationships to rock properties
- Complex rocks: Unconsolidated and consolidated clastics, carbonates with vugs and fractures, shales, and heavy oil formations
- Fluids and fluid substitution: Methods and input parameters
- Fluid relationships to rock types
- Principles of AVO

AUDIENCE

Geoscientists and engineers with some experience in at least one of the following fields: petrophysics, seismic interpretation, seismic processing, reservoir characterization, or reservoir engineering.

Seismic Survey Design using OMNI 3D® V2014

Skill – 5 Days

This five-day hands-on training class provides students with the foundations needed to use OMNI 3D® in a full range of quality control and design tasks for offshore seismic acquisition planning from field QC and navigation to advanced design analyses. This course teaches participants how to create surveys for the different acquisition configurations, perform fold analyses, insert infilling lines, and use ray tracing and OMNI target analysis to select optimal acquisition parameters.

COURSE CONTENT

- Understand Parallel, Orthogonal, Areal and random acquisition geometries
- Understand the essential acquisition parameters and how to select them.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Introduction to Depth Imaging with Omega

Skill – 10 Days

This 10-day course covers the most common workflows involved in processing a 3D dataset through a depth imaging sequence so that attendees can build, modify, and QC velocity models in SVM (including anisotropy); run and QC tomographic updates of these models; prepare data and models for Kirchhoff pre-stack migration; and run, test, and parameterize Kirchhoff prestack migration using these models.

COURSE CONTENT

- Introduction to Omega data processing platform
- Use of Petrel E&P software platform
- Petrel import/export for seismic velocity modeling (SVM) plug-in
- SVM initial model building (ISO)
- Kirchhoff Depth Migration in Omega (ISO, TTI)
- CIP picking using Omega data processing platform
- Dip and azimuth estimation
- Tomography using Omega data processing platform
- Depth imaging RMO QC tools
- Omega platform workflow
- Volumetric RMO QC using Petrel platform workflow
- Tomography tools
- Use of the prestack seismic interpretation (PSI) plug-in

Seismic Structural Interpretation

Skill – 5 Days

With a focus on building fundamental skills in seismic interpretation, this course employs practical examples demonstrating distinct aspects of various geological and tectonic provinces relative to their hydrocarbon prospectivity. In practical workshops, attendees will learn the main interpretation techniques used for seismic sections and skills for seismic data mapping. Special emphasis is given to comparisons of hand-contouring map interpretation with workstation interpretation mapping for 2D and 3D datasets.

COURSE CONTENT

- Principles of seismology and proper handling of seismic velocities
- Technologies and methodologies for seismic data interpretation in specific tectonic and geologic settings
- Seismic interpretation mapping: Hand-drawn interpretations and computer workstation mapping
- Comparisons of hand- and computer-contoured maps and map QC
- Hands-on mapping exercises for geophysical exploration and development
- Seismic attributes applicable to reservoir characterization and 2D and 3D seismic data

Practical Depth Conversion with Petrel

Skill – 5 Days

This course focuses on delivering a practical understanding of depth conversion. Attendees will learn the typical velocity types and their meanings in addition to understanding the methods of velocity representation, and using them for depth conversion from simple functions to more complex layer-based methods. Attendees will study the theory and estimation of velocities using various forms of tomography and the QC that ensures geologically reasonable results, learn the techniques for depth calibration of isotropic depth images with well control, as well as the methods and impacts of including anisotropic solutions to yield better well ties and more resolved images. This course emphasizes the formation of velocity models consistent with the well control. This is in context to creating Petrel Models suitable for reservoir simulation employing depth-calibrated inversion and other attribute cubes precisely integrated with the well information.

COURSE CONTENT

- Discuss the motivation for vertical time-to-depth conversion
• Why do we depth convert time interpretations?
• Accuracies needed for relative structure, well prognoses, volumetric estimates, and reservoir models
• Database validation
• Indicators for prestack depth migration (PSDM)
• Review common sources of velocity information
• Sonic logs, check shots, and VSPs
• Seismic (refraction, reflection)
• Review definitions and characteristics of velocities
• Types of velocities
• Conversion of velocity types
• Compactional and layered geologies
• Velocity gradients
• Define velocities fields using vertical functions
• Velocity as a function of time
• Velocity as a function of depth
• Implicit velocity representation via T-D functions
• Petrel Velocity Models with time and depth functions
• Define velocities fields using grids
• Spatial velocity variations (lateral gradients)
• Creating an edited PSTM velocity field in Petrel
• Understand methods for linking well and seismic information
• Establishing data polarity and phase
• Implement basic depth conversion using vertical functions and spatial corrections
• Single-layer (direct depth conversion) methods
• Handling spatial velocity variations (lateral gradients)
• QC methods
• Basic Petrel Velocity Models
• Explore depth conversion with layer-based methods
• Geologic and data-driven modeling considerations
• Multi-layer approaches
• Advanced Petrel Velocity Models
• Understand accuracy of vertical time-to-depth methods and when they fail
• Extreme geologic regimes
• Shallow velocity anomalies and overpressure
• Appreciate the need to review and correct the database prior to incorporating well control
• Review seismic data polarity, phase, and synthetic correlations
• Using basic depth-conversion QCs to encounter data discrepancies
• Appreciate the impact of anisotropy on seismic velocities and imaging
• Seismic anisotropy
• Parameterization (Vz, delta, epsilon, VTI/TTI)
• Problems and promise of anisotropy for velocity definition and seismic attributes
• Learn basic approach for stable integration of depth-domain seismic (PSDM)

with well control
• Working in the time domain
• Updating the time/velocity model
• Optional: Map migration for dynamic calibration and introduction to uncertainty
• Implement domain conversion and uncertainty analysis with Petrel Velocity and 3D Models
• Evaluating depth error on structure and well prognoses
• Impact of structural uncertainty on volumetrics in 3D Models

AUDIENCE
This course is of importance to geoscientists involved in seismic interpretation and subsequent time-to-depth conversion. The course is also oriented towards persons performing well calibration of depth migration data and other attributes prior to reservoir modeling.

PREREQUISITE
Petrel Fundamentals and Petrel Geophysics courses.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Skill – 5 Days

The course contains several practical exercises using Techlog in which the participants will be able to load real sonic data from Wireline and LWD sonic tools and QC the quality of the raw waveforms, as well as the maint products such as slowness projections and slownesses. Then, the user will be able to compute compressional, shear, and Stoneley slownesses from these waveforms using non-dispersive and dispersive slowness time coherence (STC) processing and dispersion analysis tools.

COURSE CONTENT
• Overview acoustic logging and its applications in the oil & gas industry
• Fundamentals of borehole acoustics and wave propagation theory
• Understand sonic tool hardware with examples from different Wireline and LWD tools
• Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc).
• Import DLIS data containing sonic waveforms and use Techlog to assign tool-specific properties
• Theory of semblance processing and slowness estimation from array waveform data
• Non-dispersive slowness time coherence (STC) processing workflow
• The importance of dispersion analysis for identifying best processing parameters
• Dispersive STC (DSTC) for dipole data
• Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
• High-resolution (multiple shot) processing
• Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
• Quadrupole shear and its applications
• Translator mode and Depth-Derived BoreHole Compensation (DDBHC)
• Processing slownesses in challenging environment: Leaky-P processing
• Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
• Case study for an exploration well: run the full P&S workflow, derive the best slownesses combining monopole and dipole results.
• The concept of anisotropy in the earth and how it is measured
• The different mechanisms of acoustic anisotropy and their applications in the oil&gas industry
• Understand and apply the four-component rotation workflow using cross-dipole sonic waveforms (preprocessing, filtering, processing)
• Anisotropy analysis finalization and presentation (including angle swapping when necessary)
• Understanding the shale anisotropy and how to characterize it using sonic data
• Case study for an exploration well: run anisotropy analysis on an exploration workflow and derive the main acoustic outputs for geomechanics and petrophysics applications.
• How to use acoustic outputs in the geomechanical workflows (mechanical earth model building, minimum and maximum horizontal stress estimation and fracture characterization)
• Petrophysics applications of sonic data (sonic porosity, Stoneley permeability, etc)
• Geophysics applications of sonic data

AUDIENCE
Anyone who desires an increased understanding of acoustic data from sonic tools and how to integrate them into their workflows.

PREREQUISITE
Basic understanding of geoscience and petroleum engineering

Seismic Stratigraphy
Foundation – 5 Days
This course teaches attendees practical seismic stratigraphic interpretation skills. With an emphasis on interpretation principles at basin and field scales, exercises are based on actual data from many different areas of the world. The attendees will learn to link the seismic expression of stratigraphy with basin type and evolution and demonstrate its application to prospective evaluation of sedimentary basins, in addition to understanding of how and when to apply seismic stratigraphy to field- and basin-scale reservoir analysis.

COURSE CONTENT
• Introduction to seismic stratigraphy
• Stratigraphic sequence fundamentals and applications
• Recognition of stratigraphic sequences on seismic data
• Geometry of sedimentary bodies
• Seismic processing effects on seismic facies expression and importance of display parameters
• Lithology, velocity, and seismic facies
• Eustacy and relative sea-level changes through time
• Sea-level and sedimentation patterns and the chronostratigraphic chart
• Review of basin formation processes and their impacts on sedimentation patterns
• Turbidite sedimentation patterns
• Mapping of seismic facies and prospective assessment
• Carbonate depositional environments

AUDIENCE
Geologists and geophysicists involved in seismic data interpretation.

PREREQUISITE
Basic knowledge of geophysics and geology, and an awareness of seismic interpretation.

AVO and Seismic Inversion
Foundation – 3 Days
This course, which covers the use of AVO and inversion techniques, helps to create the best possible petrophysics subsurface model available. A profitable
development of an oil or gas field begins with a good understanding of the subsurface as a basis for efficient and successful field management. Improved discrimination of reservoir units is made and models are generated using logs and seismic data, leading to highly accurate or highly probable (static) subsurface models compatible (if correctly up-scaled) to dynamic reservoir models obtained from reservoir engineering measurements and computations. The correct use of seismic attributes, well data analysis, AVO, and seismic inversion is essential to establish subsurface models that can be used for improved field development planning and design. The course contains Petrel platform exercises to reinforce learning; however, no prior Petrel platform experience is required. At the end of the course, attendees will understand basic concepts in quantitative seismic analysis and interpretation based on AVO, well-to-seismic calibration, and inversion techniques. The attendees will consolidate their understanding of modern technology with recent field study examples and practical workshop exercises.

**COURSE CONTENT**

- Introduction
- Seismic processing for AVO and inversion
- AVO theory and practical applications of AVO analysis – fluid factor, intercept, and gradient etc.
- Inversion theory and methods
- Well-to-seismic ties and wavelets
- Low-frequency model building
- Practical applications of seismic inversion, including lithology discrimination and rock physics inversion
- 4D and 3C inversion
- Stochastic Inversion
- Future directions—joint EM-seismic inversion, AVAZ, VSP inversion, full waveform

**AUDIENCE**

Geologists, petrophysicists, reservoir engineers, processing geophysicists and seismic interpreters involved with exploration and development of oil and gas reservoirs.

**PREREQUISITE**

Basic knowledge of applied geophysical principles and seismic interpretation.

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**Seismic Acquisition and Processing**

**Foundation – 5 Days**

In this course, attendees gain a practical understanding of seismic data acquisition and processing. Course material encompasses acquisition, processing, imaging, and extraction of geologic and petrophysical information. Data examples, exercises, and workshops illustrate the fundamentals, practical issues, and pitfalls as they affect the interpretation and integration of seismic data and information into E&P workflows. The attendees will learn the principles involved in imaging geologic structures and properties with seismic data, and the parameters that can seriously affect seismic data quality, costs, and interpretation accuracy. In addition, attendees will learn to determine whether seismic data have been recorded and processed correctly for your interpretation objectives and how to apply quality assurance steps.

**COURSE CONTENT**

- Introduction to acquisition and processing
- Seismic wave propagation, reflection and acquisition principles, and migration
- Survey design
- Acquisition geometry, 3D bin, and implementation
- Data processing factors
- Prestack and velocity analysis and signal corrections
- Statics

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**Petrel Geophysics**

**Foundation – 3 Days**

This 3-day course covers Petrel 2012 version and older to enable effective use of Petrel E&P software platform for interpreting 3D/2D seismic data. It covers topics such as seismic restoration, horizon and fault interpretation, automatic fault extraction (Aant T-tracking), surface generation from interpreted data, attribute volumes and attribute maps, overview of depth conversion, volume rendering, geobody interpretation, and genetic inversion. It also provides instruction on covers the various visualization and cropping techniques available to optimize your workflows. Attendees will learn about the benefits of interpreting in 2D and 3D interactively and see how real-time rendering of seismic data can be used for superior quality control of fault planes, surfaces, and 3D models.

Note: Synthetics seismograms and depth conversion are optional modules and covered only if time permits.

**COURSE CONTENT**

- Seismic restoration
- Importing 2D and 3D seismic data
- Cropping and realization of seismic volume
- Survey and mistie managers
- Generating synthetic seismograms (optional)
- Interactive interpretation of seismic in 2D and 3D windows
- Horizon tracking (seeded and guided autotracking in 3D and 2D)
- Making surfaces from the seismic interpretation
- Attribute volumes and attribute maps
- Ant Tracking - automated fault extraction
- Structural framework - modeling while interpreting
- Volume rendering
- Petrel platform geobody interpretation
- Genetic inversion
- Domain conversion (optional)

**AUDIENCE**

- Development and exploration geophysicists, geologists, and geoscientists working on seismic interpretation
- Petrel Fundamentals course or similar Petrel experience

**PREREQUISITE**

General knowledge of petroleum geophysics and geology and elemental software skills are recommended.

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**Fundamentals of Omega Seismic Processing System**

**Foundation – 5 Days**

This 5-day course covers the applications used in day-to-day operations of a 3D seismic processing project and will include creation of a project and an overview of
of the tools used in managing data and resources to illustrate the key applications. At the end of this class, participants will to be able to use the Omega® geophysical data processing platform to create their projects and run a range of workflows, including data input and QC, data analysis, and production processing. This course, when taken in conjunction with the applicable practical processing class (marine, land, multicomponent or OBC), will enable participants to undertake processing projects as member of a production processing team.

COURSE CONTENT
- Introduction to Omega processing platform to set up a project, build jobs, and create global parameter database
- Saving and submitting jobs, monitoring, and managing data
- Viewing data and QC
- Interactive toolkits
- Attribute creation and viewing and class review

AUDIENCE
Anyone with a need to use the Omega platform

PREREQUISITE
None

Seismic Processing for Interpreters and Others
Foundation – 5 Days

Designed for attendees who work with seismic data, this introductory course illustrates the ramifications processing decisions have on subsequent interpretations, demonstrates data potential, and warns of the possible pitfalls for the unwary interpreter.

Material is presented in a sequence that is the reverse of that for processing. Because each processing step has its own input requirements, an understanding of those requirements facilitates the user’s understanding of each preceding step. This reverse order, which puts interpretation-heavy migration presentations at the start, motivates the user to think in a new fashion.

COURSE CONTENT
- Simple imaging using zero-offset data, normal moveout (NMO) equation, and Dix interval velocities
- Zero-offset migration
- Artifacts introduced by migrating incomplete data, including 2D data
- Role of velocity in migration
- Kirchhoff and reverse-time, zero-offset migration algorithms
- Fourier transform (amplitude and phase), convolution, and correlation
- NMO correction and stack to convert data to zero offset
- Estimation of stacking velocities
- NMO and stack failures
- Kirchhoff before-stack migration
- Imaging conditions and before-stack, wave-equation migration algorithms
- Velocity analysis for depth migration, including tomography with salt-related velocity analysis
- Multiple attenuation and role of wide-azimuth acquisition geometry in multiple attenuation
- Statics: Land and marine
- Amplitude corrections, 1D and 2D filtering, including f-k filtering
- Wavelets and deconvolution
- VSP as a phase tool

AUDIENCE
Processing geophysicists, seismic data interpreters, and data acquisition specialists.

PREREQUISITE
Knowledge of geophysical principles.

Borehole Seismic Technology
Foundation – 5 Days

This course provides a review of the latest tools, technologies, and applications of borehole seismic technology. Borehole seismic tools have evolved from single-component sensors to modern seismic arrays. These modern tools, when combined with the latest technology in seismic source quality, navigational positioning, and computational abilities, can deliver in real time high-resolution borehole seismic images that extend beyond the wellbore or into the interwell volume to reduce risk in drilling and development decisions.

COURSE CONTENT
- Geophysical Principles
- Checkshot Sonic Calibration and Well Tie
- VSP Processing - Anisotropy and AVO
- Survey Design and Modeling
- Examples and Exercises
- Case Histories

Nonseismic Geophysical Methods
Foundation – 5 Days

Nonseismic data can enhance and expand seismic interpretation. This course introduces attendees to the nonseismic tools that indicate hydrocarbons and explains their integration into existing reservoir characterization. The attendees will learn which nonseismic data to acquire, and when, for the best augmentation of seismic data. Hands-on exercises and exploring recent case studies highlight the use of nonseismic data to refine the understanding of subsurface discoveries.

COURSE CONTENT
- Fundamentals of gravity and magnetic methods
- Magnetics and magnetics resolution
- Fundamentals of electrical and electromagnetic (EM) methods
- Shallow water, volcanic sills, and hydrates
- Controlled-source electromagnetic (CSEM) screening criteria
- Integrated interpretation of seismic and nonseismic data
- Sequential and joint inversions and inversion with gradient constraints
- Magnetotelluric feasibility study in Gulf of Mexico and global case studies
- Case studies: Girasol, Troll, Borneo, Brazil, Egypt, Nigeria, and Gulf of Mexico
AUDIENCE
Geoscientists involved in planning acquisition of multiple geophysical data types and interpreters responsible for combining nonseismic and seismic data.

PREREQUISITE
Awareness of exploration and appraisal phases; knowledge of seismic acquisition, processing, and interpretation.

Introduction to Geophysics with OilSim
Foundation – 4 Days

The 4-day course will introduce E&P professionals to the key concepts and principles that form the basis for value-added geophysical applications in exploration, field appraisal, and reservoir management. Learning objectives are at basic awareness to knowledge levels. Emphasis is on practical understanding of seismic acquisition, processing, imaging, interpretation, and prediction of geological and petrophysical properties from seismic. Data examples, videos, exercises, and workshops are used to illustrate key concepts. Practical issues and pitfalls be covered since they affect the application of geophysical data and information in E&P workflows. The practical aspects of seismic interpretation are covered with examples that involve seismic structural mapping, stratigraphic analysis, and amplitude/attribute methods. The course includes online simulation with OilSim upstream learning simulator.

COURSE CONTENT
• Introduction
• Role of geophysics in the E&P business
• Multiclient seismic
• Overview of geophysical techniques
• Nonseismic methods: gravity, magnetic, electromagnetic, borehole methods
• Seismic methods
• The seismic experiment
• Reflection and refraction
• Seismic wavelet
• P and S waves
• Multifold acquisition
• OilSim challenge 1: finding basins
• Marine Seismic Acquisition
• Simultaneous sources
• Hydrophones and streamers
• Streamer steering
• Over/under acquisition
• Wide azimuth and coil acquisition
• Seismic acquisition QC
• Land seismic
• Impact of near surface on data quality
• Land seismic sources - dynamite and vibroseis
• Simultaneous sources
• Geophones and arrays
• Land seismic operations
• Borehole seismic acquisition
• Borehole geophysical principles
• Checkshots and VSPs
• Seismic while drilling
• Cross-well seismic
• Data Conditioning
• Near-surface corrections
• Noise attenuation
• Multiple attenuation
• Wavelet shaping and Regularization
• Velocity modeling
• OilSim simulator challenge 2: prospecting
• Interpretation of geophysical data
• Trap definition
• Synthetic seismograms
• Seismic stratigraphy
• Amplitudes and attributes
• Attributes, AVO and inversion
• OilSim simulator challenge 3: exploration drilling

Petrel Quantitative Interpretation
Advanced – 4 Days

The new Petrel Quantitative Interpretation (QI) course is designed for any experienced geoscientists who wants to perform seismic quantitative interpretation using Petrel. The objective for the user is to get familiar with the new integrated QI modules released with Petrel 2014, located in the Advanced Geophysics perspective.

COURSE CONTENT
• Rock physics Rock physics review
• Rock physics workflow
• Rock physics studies
• Fluid substitution in rock physics
• Shear velocity estimation from empirical relationships
• Log blocking Backus workflow
• AVO Modeling AVO modeling workflow
• AVO approximations
• AVO classes
• Fitting of AVO approximations to seismic data
• AVO Modeling study
• Wedge modeling
• AVO reconnaissance AVO reconnaissance tool
• Simultaneous seismic inversion and the inversion property builder What is seismic inversion?
IMMERSIVE LEARNING PROGRAMS

- Inversion preparation: Well tie and wavelet extraction
- Low frequency model building and QC with the Inversion property builder
- Simultaneous inversion and results
- Inversion for 2D Lines
- Data input for AVOZ inversions
- Stochastic seismic inversion: What is Stochastic inversion?
- Stochastic inversion preparation
- Set up and run a stochastic inversion
- Stochastic inversion run evaluation
- Applications: Stochastic inversion results
- Volume attribute modeling

AUDIENCE

Geophysicists and geologists experienced with Petrel and with good knowledge in the Reservoir characterization workflow, Geostatistics and Seismic interpretation and seismic well tie

PREREQUISITE

Petrel Geophysics foundation and skill level courses.

WinGLink for Analysis and Inversion of Magnetotelluric, EM, Gravity, and Magnetic Data

Advanced – 3 Day

This 3-day course presents the workflows for analysis and inversion of magnetotelluric, time domain EM, gravity, and magnetic data. The workflows focus on the data visualization and editing, the construction of map attributes, model building, and inversion. Attendees will learn how to create projects, analyze the data, build a model, and do inversion of MT, TDEM, gravity, or magnetic data. The course will guide participants through the diverse WinGLink modules including maps, soundings, pseudosections, X-sections, 2D inversion, and 3D modeling.

The class illustrates how the WinGLink application is used, taking diverse datasets for each discipline workflow.

COURSE CONTENT

- WinGLink workflows
- TDEM soundings, static shift, and correction by TDEM data
- MT 2D workflow: model building, inversion and modeling, maps and X-sections
- MT 3D workflow: Inversion
- Gravity maps and magnetic maps
- Gravity 2.75D modeling and magnetic 2.75D modeling

AUDIENCE

Geoscientists, geophysicists, and geologists with a need to learn the workflow for the analysis and inversion of MT, time-domain EM, gravity, and magnetic datasets.

PREREQUISITE

Knowledge and understanding of magnetotelluric, time-domain electromagnetic, gravity and magnetic data processing theory, basic geology and rock physics, and the concepts of the interpretation workflow.

Seismic Well Tie

Skill – 2 Hours

In this two hours virtual class, you will learn how to calibrate a sonic log and get an enhanced time-depth relationship, how to extract different type of wavelets using analytical, statistical and determinist methods, all of this to be used to create a synthetic seismogram and adjust the well depths to the seismic times and generate a final T-D relationship. Additionally depth seismic calibration workflow in Petrel will be shown as has become a regular need nowadays.

COURSE CONTENT

- Sonic calibration
- Wavelet extraction
- Synthetic generation
- Integrated seismic well tie approach
- Depth seismic calibration

AUDIENCE

All geoscientists that work with geophysics interpretation, domain conversion and structural mapping

PREREQUISITE

Attendees should be familiar with Petrel fundamentals and geophysics interpretation background and workflows.

Techlog Acoustics Processing and Interpretation

Skill – 4 Days

This course teaches the theory, processing and interpretation of sonic waveforms using Techlog platform. Participants will learn how to QC raw data such as waveforms, and slowness projections. Participant will also learn how to perform field data slownesses relabeling and process acoustic data for formation slownesses and anisotropy. Also, dispersion analysis tools will be explained in detail to allow users to define the most appropriate parameters for their processing.

COURSE CONTENT

- Borehole acoustics and tool theory
- Acoustics data type in Techlog
- Data import and preparation
- Visualization and QC of Waveforms
- Relabeling on field processed data
- Slowness processing theory and workflows
- Dispersion analysis and its application
- Acoustic anisotropy theory and workflows
- Anisotropy processing using four-component rotation module
- Porosity and Elastic properties calculation from Slownesses
- Application of Sonic data to Petrophysics, Geophysics, Geomechanics etc.

AUDIENCE

Petrophysicists, Geophysicists, Geomechanics engineers, Log analysts and any user working with borehole acoustic data such as formation slownesses.

PREREQUISITE

Techlog Fundamentals

Practical Land Seismic Processing with Omega

Skill – 5 Days

This 5-day course covers use of the Omega software processing package to process a land 3D seismic dataset through a basic time processing sequence. It includes parameter testing from example flows and converting these into production flows. The use of the InVA will be covered to pick a stacking velocity field. Participants will learn the appropriate QC for each step of the processing sequence and how to sort data to different domains.
COURSE CONTENT

- Land data reformat with data sorting and basic refraction statics
- Noise attenuation, examining surface consistent techniques, shot and receiver domain noise attenuation, and 3D random noise attenuation
- Velocity picking
- Interpolation and smoothing
- Residual statics
- Kirchhoff prestack time migration
- Final stack
- Poststack processing
- Class review

AUDIENCE

Individuals with a need to know how to use Omega SPS to process land seismic data

PREREQUISITE

Understanding of seismic data processing and common data processing concepts and challenges and Fundamentals of Omega course for those with no knowledge of the Omega platform.

Petrel Geophysics - Advanced

Skill – 2 Days

The course focuses on seismic interpretation workflows, techniques and best practices. This includes how to create and use different seismic attributes like Generalized Spectral Decomposition (GSD), Consistent Dip, Consistent Curvature, Directional Blending etc., different techniques of seismic attributes blending, attributes overlay in an interpretation window, Seismic Mixer (RGB/CYM - blending, Flip/Roll, Mask), attributes map generation, interactive cross-plotting of seismic attributes, populate seismic attributes in a 3D structured grid for analysis, optical stacking, conventional & contemporary methods of faults extraction, modelling while interpreting and workflow editor setup for automatic attributes creation.

COURSE CONTENT

- Interpreters’ use of seismic attributes
- Available seismic attributes
- Using seismic attributes to enhance the quality of seismic data
- Seismic Mixer (RGB/CYM - blending, Flip/Roll, Mask)
- interactive cross-plotting of seismic attributes
- populate seismic attributes in a 3D structured grid for analysis
- Generate seismic attribute maps/surfaces
- Seismic attributes blending techniques in petrel
- optical stacking
- Conventional & contemporary methods of fault extraction
- Multi-Z interpretation
- interactive mesh editing
- convert editable triangle mesh to multi-Z interpretation
- Different methods of extracting a geobody
- Sample a geobody into a 3D grid
- Train estimation model – neural nets for seismic attributes classification
- Lithology identification using genetic inversion

AUDIENCE

Individuals with a need to know how to use Omega geophysical data processing platform to process marine seismic data

PREREQUISITE

Understanding of seismic data processing and common data processing concepts and challenges and Fundamentals of Omega course for those with no knowledge of the Omega platform.

Petrel Geophysics: Seismic Interpretation Workflow Tools

Skill – 2 Days

This course builds on the Petrel Seismic Visualization and Interpretation course and focuses on seismic interpretation workflows, techniques, and best practices. The course includes creating and using different seismic attributes, seismic data quality enhancement using seismic attributes, conventional and contemporary methods of faults extraction, seismic attributes blending techniques, populating a model with seismic attributes, crossplotting for surface attributes to find correlation among seismic attributes, and setting up a workflow editor for automatic attribute creation. The course also covers various workflows for geobody interpretation using different probes, populating a geobody into a 3D grid, train estimation model using neural networks to find correlation in seismic attributes for interpretation purposes, and lithology identification while using genetic inversion in Petrel.

COURSE CONTENT

- Use of available seismic attributes to enhance seismic data quality
- Conventional and contemporary methods of fault extraction

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Introduction to Depth Imaging with Omega

Skill – 10 Days

This 10-day course covers the most common workflows involved in processing a 3D dataset through a depth imaging sequence so that attendees can build, modify, and QC velocity models in SVM (including anisotropy); run and QC tomographic updates of these models; prepare data and models for Kirchhoff pre-stack migration; and run, test, and parameterize Kirchhoff prestack migration using these models.

COURSE CONTENT
- Introduction to Omega data processing platform
- Use of Petrel E&G software platform
- Petrel import/export for seismic velocity modeling (SVM) plug-in
- SVM initial model building (ISO)
- Kirchhoff Depth Migration in Omega (ISO, TTI)
- CIP picking using Omega data processing platform
- Dip and azimuth estimation
- Tomography using Omega data processing platform
- Depth imaging RMO QC tools
- Omega platform workflow
- Volumetric RMO QC using Petrel platform workflow
- Tomography tools
- Use of the prestack seismic interpretation (PSI) plug-in
- Localized CIP Picking in Petrel
- Seiscal kit in Petrel platform
- SVM anisotropic model building (TTI)
- Use of the map migration plug-in

AUDIENCE
Geophysicists with a need to use Omega and Petrel platforms to run depth imaging workflows.

PREREQUISITES
- Mandatory competency using Omega software platform, preferred competency using Petrel software platform, and required understanding of the concepts underlying time seismic data processing and common depth processing challenges. This class needs to be taken in conjunction with the Seismic Velocity Modeling class to understand how to derive viable models suitable for depth processing.

Petrel Prestack Seismic Interpretation

Skill – 2 Days

This exposes seismic interpreters to the use of prestack seismic data in a typical interpretation workflow involving time migrated data in amplitude- and nonamplitude-supported settings. The course includes general theory and practical aspects with hands-on exercises directly in the Petrel platform. The course covers three aspects of prestack data use as implemented by the plug-in prestack visualization prestack interpretation prestack processing.

COURSE CONTENT
- Quick prestack data overview (acquisition, gather, processing, stacking, etc.)
- Load prestack data into the Petrel platform
- Visualize data in the prestack and 3D windows
- Analyze data with on-the-fly stacks and single offset volumes
- Pick and apply the muting function and simple on-the-fly gather processing
- Pick and interpret prestack events
- Extract and analyze prestack event attributes
- Examples of AVO workflows in the Petrel platform supported by prestack seismic interpretation (PSI)
- SEG Y to DIO conversion

AUDIENCE
Geophysicists, seismic interpreters, and seismic processors.

PREREQUISITE
- The Petrel Fundamentals and Petrel Geophysics courses, or equivalent Petrel interpretation experience and general geophysical knowledge. Seismic processing knowledge is advantageous.

Seismic Survey Design using OMNI 3D® V2014

Skill – 5 Days

This five-day hands-on training class provides students with the foundations needed to use OMNI 3D® in a full range of quality control and design tasks for offshore seismic acquisition planning from field QC and navigation to advanced design analyses. This course teaches participants how to create surveys for the different acquisition configurations, perform fold analyses, insert infilling lines, and use ray tracing and OMNI target analysis to select optimal acquisition parameters.

COURSE CONTENT
- Understand Parallel, Orthogonal, Areal and random acquisition geometries
- Understand the essential acquisition parameters and how to select them:
  - Get familiar with the different elements of the OMNI 3D® interface
  - Learn to create and edit NAZ, MAZ, WAZ, RAZ and FAZ geometries in OMNI 3D®
  - Learn to import and export streamer surveys in P190 format
  - Learn to insert an infill line into a streamer survey in OMNI 3D
  - Learn to layout survey inside a given boundary
  - Learn to efficiently create images and reports
  - Learn to create 2D Earth Models for 2D Ray Tracing and Wave equation modelling.
• Understand how to use the ray traced and Wave equation analysis and synthetics for acquisition parameters estimation.
• Learn to create a 3D Earth Model in OMNI 3D®
• Learn to use a 3D Earth model to perform target analysis and create 3D synthetics using ray tracing
• Learn to do illumination of a target
• Learn to use the OMNI Workshop analysis tools to perform analysis to predict Footprint, PSTM response and AVO response for a given streamer survey
• Learn to use the OMNI 3D tools for OBS, VSP and Time-Lapse surveys
• Review client marine seismic acquisition challenges
• Workshop about the main seismic acquisition challenges

AUDIENCE
This class is suitable for geophysicists and geologists wanting to learn how to design offshore seismic surveys with the OMNI 3D® software package.

PREREQUISITE
A basic understanding of the seismic acquisition concepts. No prior experience with OMNI 3D® is required.

Petrel Seismic Well Tie
Skill – 2 Days

This course will introduce the attendees to the existing workflows in the seismic well tie process. Attendees will be guided through the required steps to generate the seismic well tie, covering the three main workflows: sonic calibration, synthetic generation, and integrated seismic well tie. Supporting these workflows, the attendees will have access to the log conditioning and wavelet toolbox, which provides interactive functionalities for the creation or manipulation of the different inputs used in the seismic well tie workflows.

COURSE CONTENT
• Quality control and editing of checkshots and sonic and density logs
• Calibrate sonic log with checkshots
• Synthetic seismogram generation
• Wavelet creation and extraction
• Integrated seismic well tie

AUDIENCE
Geophysicists, geologists, and petrotechnical personnel with prior experience in using the Petrel software platform.

PREREQUISITE
General knowledge of petroleum geology and geophysics; Petrel Fundamental; and Geophysics courses or equal experience in the use of the Petrel software.

Petrel Workflow Editor and Uncertainty Analysis
Skill – 2 Days

The course is two-fold as it aims at giving the students insight into the Workflow editor and the Uncertainty / Optimization process. The first day will focus on how to create your own workflows for batch processing and operations, in addition to setting up, editing and repeating processes with new data for a complete reservoir modeling workflow. Day two will focus on understanding sensitivities and uncertainties of a Base case volumetric reservoir model. Structural uncertainties related to surfaces and velocities will be explored, as well as stochastic parameters related to fluid contacts, facies and petrophysical uncertainties.

COURSE CONTENT
• Workflow Editor interface and logic
• Running predefined workflows

• Creating user defined workflows
• Updating 3D models with new input data
• Get familiar with the Uncertainty and optimization process Sensitivity and uncertainty analysis setup
  – Structural uncertainty
  – Fluid contact uncertainty
  – Property uncertainty

AUDIENCE
Development and exploration geologists, geophysicists, petroleum engineers, managers, and technical personnel with good experience in Petrel.

PREREQUISITE
Petrel Fundamentals or equivalent experience in Petrel. General good knowledge in the geology, geophysics domain.

Petrel Velocity Modeling
Skill – 3 Days

This course introduces the attendee to velocity modeling, velocity handling, and domain conversion functionality in the Petrel 2013 platform.

The course takes the attendee through the preparation stage of data used for velocity estimation and modeling. This preparation includes quality control and edit of checkshot data used in sonic calibration and quality control of time surfaces and well tops used for defining velocity intervals.

Furthermore, the available velocity modeling approaches are discussed, including well velocity estimation, the nature and modeling of seismic velocities, surface-based and 3D grid-based seismic velocity modeling, as well as user-defined velocity functions. After the velocity modeling phase, domain conversion of various objects and methods for modeling structural uncertainty are covered.

COURSE CONTENT
• Quality control and editing of well data and velocity modeling
• Checkshot calibration of sonic logs
• Available velocity functions as well as different velocity modeling approaches
• Depth error analysis and correction
• Surface- and 3D grid-based seismic velocity modeling
• Addressing anisotropy in seismic velocities
• Geostatistical methods in modeling well velocities vs. seismic velocities
• Quantifying residual depth error and creating a depth correction model to address the residuals
• Creating user defined velocity functions
• Domain conversion
• Modeling of structural uncertainty

Petrel Geophysics
Foundation – 3 Days

This 3-day course covers Petrel 2012 version and older to enable effective use...
of Petrel E&P software platform for interpreting 3D/2D seismic data. It covers topics such as seismic restoration, horizon and fault interpretation, automatic fault extraction (Aant T-tracking), surface generation from interpreted data, attribute volumes and attribute maps, overview of depth conversion, volume rendering, geobody interpretation, and genetic inversion. It also provides instruction on covering the various visualization and cropping techniques available to optimize your workflows. Attendees will learn about the benefits of interpreting in 2D and 3D interactively and see how real-time rendering of seismic data can be used for superior quality control of fault planes, surfaces, and 3D models.

Note: Synthetics seismograms and depth conversion are optional modules and covered only if time permits.

**COURSE CONTENT**
- Seismic restoration
- Importing 2D and 3D seismic data
- Cropping and realization of seismic volume
- Survey and mistie managers
- Generating synthetic seismograms (optional)
- Interactive interpretation of seismic in 2D and 3D windows
- Horizon tracking (seeded and guided autotracking in 3D and 2D)
- Making surfaces from the seismic interpretation
- Attribute volumes and attribute maps
- Ant Tracking - automated fault extraction
- Structural framework - modeling while interpreting
- Volume rendering
- Petrel platform geobody interpretation
- Genetic inversion
- Domain conversion (optional)

**AUDIENCE**
- Development and exploration geophysicists, geologists, and geoscientists working on seismic interpretation
- Petrel Fundamentals course or similar Petrel experience

**PREREQUISITE**
General knowledge of petroleum geophysics and geology and elemental software skills are recommended.

**Fundamentals of Omega Seismic Processing System**

**Foundation – 5 Days**

This 5-day course covers the applications used in day-to-day operations of a 3D seismic processing project and will include creation of a project and an overview of the tools used in managing data and resources to illustrate the key applications. At the end of this class, participants will be able to use the Omega* geophysical data processing platform to create their projects and run a range of workflows, including data input and QC, data analysis, and production processing. This course, when taken in conjunction with the applicable practical processing class (marine, land, multicomponent or OBC), will enable participants to undertake processing projects as member of a production processing team.

**COURSE CONTENT**
- Introduction to Omega processing platform to set up a project, build jobs, and create global parameter database
- Saving and submitting jobs, monitoring, and managing data
- Viewing data and QC
- Interactive toolkits

- Attribute creation and viewing and class review

**AUDIENCE**
- Anyone with a need to use the Omega platform

**PREREQUISITE**
- None

**Studio for Petrel Users**

**Foundation – 1 Days**

This course is designed for users who are already familiar with Petrel, but who need to learn about Studio from a user’s perspective. The purpose of this course is to describe basic concepts used in Studio (such as repositories and indexes) and learn how to work in a Studio environment. The training focuses on tools in Petrel that interact with Studio. This course covers topics such as setting up a database connection and synchronizing data between a Petrel project and a Studio repository.

**COURSE CONTENT**
- Overview and basic concepts
- Petrel and the Studio Database
- Data transfers
- Find your data
- Collaborate with your team
- Manage your data

**AUDIENCE**
- Geophysicists, geologists, geochemists, and technical personnel familiar working in Petrel, but no experience in Studio.

**PREREQUISITE**
- Petrel fundamental

**Petrel Shale Fundamentals**

**Foundation – 3 Days**

The Petrel Shale Fundamentals course is designed for new users who are not familiar with Petrel and need to use Petrel for shale oil and gas exploration and development. The course covers basic usage of the application, providing an understanding of how to get started with Petrel Shale Perspective tools. In addition, You will learn about the Petrel interface, project set-up, data import and visualization, well section window, well correlation, seismic interpretation for horizons and faults, 1D petroleum system modeling, pad placements, pad well design tools, geosteering and plotting (general and production engineering).

**COURSE CONTENT**
- Introduction to Petrel
- Well data loading and data structure
- Well section
- Well tops use and interpretation
- Seismic interpretation
- Exploration tools
- Pad placement
- Pad well design
- Well design
- Geosteering
- Production engineering
IMMERSIVE LEARNING PROGRAMS

AUDIENCE
Geophysicists, geologists, geochemists, and technical personnel not familiar with Petrel workflows and involved in shale oil and gas exploration and development.

PREREQUISITE
Knowledge on geosciences workflows

Working with time-depth data in Petrel

Awareness – 1 Hours

In this one hour virtual class, you will learn how to import checkshots and quality control of import with the purpose to display well traces in time domain. As well you will learn some additional ways to create a time-depth relationship. Last, how to edit and condition sonic logs to remove despikes is shown. All this in preparation to extract synthetics that is one of the critical workflows for seismic interpreters.

COURSE CONTENT
- Load and quality control checkshot data
- Create new time-depth relationships
- Well data visualization in time domain
- Additional workflows to create TDR
- Condition log data in preparation for Sonic calibration and synthetic generation

AUDIENCE
All geoscientists that work with geophysics interpretation, domain conversion and structural mapping

PREREQUISITE
Attendees should be familiar with Petrel fundamentals and geophysics interpretation background and workflows

Petrel Fundamentals

Awareness – 2 Days

This course introduces a new user to the Petrel platform functionality with emphasis on visualization, data organization, and collaboration. The course will take the attendees from Petrel platform project setup to plotting the results. Attendees will learn how to create surfaces and a simple grid as well as how to QC and visualize a simple grid using the geometrical modeling process, maps, and intersections. This course also introduces the Studio environment, which empowers a new level of usability, collaboration, and productivity.

COURSE CONTENT
- Studio environment (Find, Collaborate, and Manage)
- Petrel software introduction
- Project setup, coordinates, and units
- Petrel interface, general tools, and windows
- Modeling concepts overview
- Surface constructing and editing
- Simple grid constructing
- Geometrical modeling
- Data plotting
- Knowledge sharing and collaboration

AUDIENCE
Development and exploration geologists, geophysicists, geochemists, geoscientists, petroleum engineers, managers, and technical IT personnel with no previous Petrel platform software experience.

PREREQUISITE
General knowledge of petroleum geology and geophysics or reservoir engineering as well as elemental software skills.

Petrel User Experience

Awareness – 1 Day

The Petrel User Experience course is designed for users who have prior experience in Petrel but need to quickly transition to the new user interface. The course describes the new design elements that encompass the user interface and demonstrates its efficiency through workflow exercises. These workflow exercises cover each domain including geology, geophysics, exploration geology, reservoir engineering, production engineering and drilling. Participants will carry out those workflows pertinent to them.

COURSE CONTENT
- Design elements of the 2014 User experience
- Studio tools and usage with the new user interface
- Exploration Geology workflow: Petroleum systems 1D and 3D data access
- Geology workflow: Well correlation and 3D modeling
- Geophysics workflow: Seismic display and horizon interpretation
- Reservoir Engineering workflow: Create and run a simple simulation case
- Well Design workflow: Create well plans that intersect geological targets
- Well Deliverability workflow: Well completion design

AUDIENCE
Geophysicists, geologists, geochemists, Reservoir engineers and technical personnel already familiar with working in Petrel prior 2014

PREREQUISITE
None

Integrated Nonseismic and Seismic Methodologies for Geoscientists

Skill – 5 Days

This 5-day integrated course introduces geoscientists to the physical concept of each electromagnetic, potential field, and seismic measurement to illustrate the added value of integrated methodologies for a better understanding of specific geologic targets in both marine and land environments. This course objective is to introduce the IEM plug-in features on Petrel 2013 for magnetotelluric and controlled source electromagnetic data, surface and refraction seismic data viewing and editing, resistivity, Vs, Vp model property and forward modeling, and inversion workflow.

Course structure: electromagnetic method (physics, data acquisition, processing and interpretation, practice), potential field method (physics, data acquisition, processing and interpretation), seismic waves (physics, data acquisition, processing and interpretation, practice), simultaneous joint inversion (concept and practice)

COURSE CONTENT
- Electromagnetic method: magnetotelluric (MT) data physics, data acquisition and field processing, data visualization and editing, data inversion and interpretation
- Electromagnetic method - controlled source EM (CSEM) physics, data acquisition and field processing, data visualization and editing, data inversion and interpretation
- Potential field method
- Physics of gravity, full-tensor gravity gradiometry, and magnetic data
- Gravity data acquisition and field processing
- Gravity data inversion and interpretation

PREREQUISITE
None

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Surface wave and refraction wave
• Physics of surface and refraction seismic wave
• Surface wave data analysis
• Refraction wave data analysis
• Vp and Vs model building in Petrel E&P software platform
• Surface wave data inversion and interpretation
• Refraction wave data Inversion and Interpretation
• Simultaneous joint inversion (SJII)

AUDIENCE
Geophysicists, geologists, and geoscientists working with EM, potential field method, seismic data

PREREQUISITE
• General knowledge of geophysics or geology
• Petrel fundamental course or familiarity with Petrel interface and core functions
• Omega fundamental course or familiarity with Omega interface and core functions

PREREQUISITE
• General knowledge of geophysics or geology
• Petrel fundamental course or familiarity with Petrel interface and core functions
• Omega fundamental course or familiarity with Omega interface and core functions

COURSE CONTENT
• Overview acoustic logging and its applications in the oil & gas industry
• Fundamentals of borehole acoustics and wave propagation theory
• Understand sonic tool hardware with examples from different Wireline and LWD tools
• Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc).
• Import DLIS data containing sonic waveforms and use Techlog to assign tool-specific properties
• Theory of semblance processing and slowness estimation from array waveform data
• Non-dispersive slowness time coherence (STC) processing workflow
• The importance of dispersion analysis for identifying best processing parameters
• Dispersive STC (DSTC) for dipole data
• Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
• High-resolution (multiple shot) processing
• Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
• Quadrupole shear and its applications
• Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
• Processing slownesses in challenging environment: Leaky-P processing
• Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
• Case study for an exploration well: run the full P&S workflow, derive the best

slownesses combining monopole and dipole results.
• The concept of anisotropy in the earth and how it is measured
• The different mechanisms of acoustic anisotropy and their applications in the oil&gas industry
• Understand and apply the four-component rotation workflow using cross-dipole sonic waveforms (preprocessing, filtering, processing)
• Anisotropy analysis finalization and presentation (including angle swapping when necessary)
• Understanding the shale anisotropy and how to characterize it using sonic data
• Applications of anisotropy to Drilling and completion applications (stress direction, fractures, shale anisotropy, etc)
• Case study for an exploration well: run anisotropy analysis on an exploration workflow and derive the main acoustic outputs for geomechanics and petrophysics applications.
• How to use acoustic outputs in the geomechanical workflows (mechanical earth model building, minimum and maximum horizontal stress estimation and fracture characterization)
• Petrophysics applications of sonic data (sonic porosity, Stoneley permeability, etc)
• Geophysics applications of sonic data

AUDIENCE
Anyone who desires an increased understanding of acoustic data from sonic tools and how to integrate them into their workflows.

PREREQUISITE
Basic understanding of geoscience and petroleum engineering

COURSE CONTENT
• Marine data reformat, including noise attenuation workflows, linear and swell noise, and wavelet processing
• Demultiple techniques, including generalized surface multiple prediction (GSMP) and weighted least squares (WLS) radon.
• Regularization and velocity picking
• Vertical and horizontal QC of the picked velocities and the use of mute overlays to visualize the stretch mute on the gathers.
• Migration
• Mutes
• Final stack
• Class review

AUDIENCE
Individuals with a need to know how to use Omega geophysical data processing platform to process marine seismic datasets through a basic time-processing sequence. It will include parameter testing from example flows and how to convert these into production flows. The use of the interactive velocity analysis application (InVA) will be covered to pick a migration velocity field. Participants will learn the appropriate QC for each step of the processing sequence and how to sort data to different domains.

PREREQUISITE
Basic understanding of geoscience and petroelum engineering
Practical Seismic Attributes with Petrel
Skilled – 3 Days
This course will present the practical aspects of generating and understanding seismic attribute responses and relating these from the mathematical geophysical generation to practical geological understanding and application. The course will focus on outlining the use of seismic attributes in specific geological environments and identifying specific geological features. The course philosophy is that learning is an active experience; apply understanding over memorization; provide fundamentals for growth; and provide skills for application. The learning objectives for the course include teaching the theory of seismic attributes, the practice of seismic attributes, seismic attributes using the Petrel platform, and prepare the attendants for using seismic attributes in their work.

COURSE CONTENT
• Theory of seismic attributes
• Seismic attributes in the Petrel platform
• Colors and visualization of attributes
• Surface attributes in the Petrel platform
• Geological scenarios and the applications of attributes
• Noise reduction
• Stratigraphic applications
• Channels and fluvial systems
• Geological scenarios and the applications of attributes
• Formation orientation
• Lithology indicators
• Textural attributes
• Structural attributes
• Edge detection
• Fracture indicators
• Carbonates and Salt
• Direct hydrocarbon indicators
• Create seismic attributes using the seismic calculator
• Seismic attribute workflows and best practices
• Getting help
• Thoughts for the future
• Group project

AUDIENCE
Geoscientists interpreting seismic data volumes.

PREREQUISITE
Petrel Fundamentals course is required and the Petrel Geophysics course is recommended.

Practical Land Seismic Processing with Omega
Skilled – 5 Days
This 5-day course covers use of the Omega software processing package to process a land 3D seismic dataset through a basic time processing sequence. It includes parameter testing from example flows and converting these into production flows. The use of the InVA will be covered to pick a stacking velocity field. Participants will learn the appropriate QC for each step of the processing sequence and how to sort data to different domains.

COURSE CONTENT
• Land data reformat with data sorting and basic refraction statics
• Noise attenuation, examining surface consistent techniques, shot and receiver domain noise attenuation, and 3D random noise attenuation
• Velocity picking
• Interpolation and smoothing
• Residual statics
• Kirchhoff prestack time migration
• Final stack
• Poststack processing
• Class review

AUDIENCE
Individuals with a need to know how to use Omega SPS to process land seismic data

PREREQUISITE
Understanding of seismic data processing and common data processing concepts and challenges and Fundamentals of Omega course for those with no knowledge of the Omega platform

Practical AVO and Seismic Inversion with Petrel
Skilled – 5 Days
AVO and inversion techniques play a significant role in creating petrophysical models of the subsurface. These geosubsurface models are compatible with dynamic reservoir models built with reservoir engineering measurements and computations. Attendees will learn the correct use of seismic attributes, well data analysis, and AVO and seismic inversion in building subsurface models suitable for improved field development planning and design in addition to learning the basic concepts used in quantitative seismic analysis and AVO-based interpretation, calibration of well to seismic data, and inversion techniques. Your understanding of technologies will be consolidated through recent field study examples and practical workshop exercises.

COURSE CONTENT
• Introduction to seismic reservoir characterization
• Software and quantitative interpretation techniques
• AVO theory, inversion, modeling, QC, and preconditioning
• Well-to-seismic calibration
• Wavelet estimation and inversion methods
• Prestack and poststack, acoustic, and elastic inversion
• Analyzing well logs for AVO and inversion response
• Rock physics and fluid replacement modeling
• Hydrocarbon indicators
• Recent inversion methods and R&D
• 4D and 3C Inversion
• Stochastic Inversion

AUDIENCE
Geologists, petrophysicists, reservoir engineers, processing geophysicists, and seismic data interpreters involved with exploration and development of oil and gas reservoirs.

PREREQUISITE
Basic knowledge of applied geophysical principles and seismic data interpretation.
Practical Seismic Interpretation with the Petrel

Skill – 5 Days

This course provides E&P professionals with seismic data visualization, integration, and interpretation techniques that have been recently developed. The attendees will gain a solid understanding of the applications and role of the seismic interpreter in studies that involve poststack seismic attributes, AVO, seismic sequence stratigraphy, seismic geomorphology, 4D time-lapse seismic, and multidisciplinary integration. Recent and relevant case histories, data examples, and exercises, conducted both on paper, and with the Petrel platform, will guide the attendees in understanding that the integration of all available data into the seismic model adds value in the required coherent and successful seismic predictions that result from an interpretation.

COURSE CONTENT
- Introduction and general overview
- Fundamentals of signal theory, wavelet, resolution, and scaling
- Geological concepts, sedimentary models, and structural styles
- Introduction to the Petrel software platform
- 2D and 3D interpretation techniques
- Poststack attributes, reflective attributes, and transmissive attributes
- Spectral decomposition
- Multicomponent seismic interpretation

AUDIENCE
E&P managers, geoscientists, and reservoir engineers involved in seismic interpretation or working with results of seismic data interpretation.

PREREQUISITE
Basic or intermediate seismic interpretation knowledge.

Borehole Seismic Acquisition, Processing, and Operations

Skill – 5 Days

This course presents an overview of all aspects of borehole seismic acquisition, operations, and processing techniques. Practical exercises are conducted using a test well at the Schlumberger Training Centre in Aberdeen using Schlumberger wireline borehole seismic equipment. The practical exercises will consist of running the VSI versatile seismic imager with up to 4 x 3 component receivers in a 772-ft deep well and acquire VSP data using an airgun source (Run 1), which will be a 3 x 150-cu. in. G-Gun cluster (a typical offshore source) deployed in a 5-m diameter, 5-m deep purpose-built gun pit and operated with the TRISOR Insea source controller. For Run 2 the VSP will be acquired using a vibrator as the energy source. The Vibrator is a Mertz M-18HD Vibrator buggy operated with the Pelton VibPro controller. Schlumberger’s VSI imager acquisition software (workbench) will be used for Runs 1 and 2, and all QC features of the software will be used and shown to ensure data quality optimization. The participants are encouraged to assist with the rigging up/down of all equipment, wireline winch driving, and data acquisition.

COURSE CONTENT
- Basic well seismic principles and applications
- VSP acquisition examples
- Borehole seismic acquisition and tools
- VSP acquisition airgun
- VSP acquisition vibrator
- Quality control
- Borehole seismic modeling
- Borehole seismic data processing
- Advanced operations
- Advanced conveyance
- Advanced processing

AUDIENCE
Geologists and geophysicists having the need to understand the acquisition, principles, uses, and applications of borehole seismic data.

PREREQUISITE
Basic understanding of geology and geophysical methods.

Practical Depth Conversion with Petrel

Skill – 5 Days

The first part of this 10-day course covers the nature of velocity fields and practical approaches to velocity representation with appropriate depth-conversion methods presented in case studies and exercises. Single-layer and more sophisticated multi-layer approaches are reviewed, along with depth-error analysis and the impact on formation top prognoses and volumetrics. Database validation is addressed to confirm horizons correlation and the formation of basic seismic time and formation top QCs.

This course emphasizes the formation of velocity models consistent with well control in context with creating Petrel platform models suitable for reservoir simulation employing depth-calibrated inversion and other attribute cubes precisely integrated with the well information.

COURSE CONTENT
Overview of Depth Conversion
- Discuss the motivation for vertical time-to-depth conversion
- Why do we depth convert time interpretations?
- Accuracies needed for relative structure, well prognoses, volumetric estimates, and reservoir models
- Database validation
- Indicators for prestack depth migration (PSDM)
- Discussions on student goals and experiences with time-to-depth conversion
- Sources of Velocity
- Review common sources of velocity information
- Sonic logs, check shots, and VSPs
- Seismic (refraction, reflection)
- Defining Velocity Types
- Review definitions and characteristics of velocities
- Types of velocities
- Conversion of velocity types
- Compactional and layered geologies
- Velocity gradients
- Functional Representation of Velocities
- Define velocities fields using vertical functions
- Velocity as a function of time
- Velocity as a function of depth
- Implicit velocity representation via T-D functions
- Petrel Velocity Models with time and depth functions
- Various problems defining velocity fields in various domains
- Advanced operations
- Advanced conveyance
- Advanced processing

AUDIENCE
E&P managers, geologists, and reservoir engineers involved in seismic operations, and processing techniques.
Gridded Representation of Velocities
• Define velocities fields using grids
• Spatial velocity variations (lateral gradients)
• Creating an edited PSTM velocity field in Petrel
• Import SEG Y velocities to Petrel and forming a gridded model
• Well and Seismic Data Integration
• Understand methods for linking well and seismic information
• Establishing data polarity and phase
• Dispersion and other considerations
• Problem sets and interactive work sessions
• Vertical Time-to-Depth Conversion (Basic)
• Implement basic depth conversion using vertical functions and spatial corrections
• Single-layer (direct depth conversion) methods
• Handling spatial velocity variations (lateral gradients)
• Vertical Time-to-Depth Conversion (Advanced)
• Explore depth conversion with layer-based methods
• Geologic and data-driven modeling considerations
• Multi-layer approaches
• Advanced Petrel Velocity Models
• Problem sets and interactive work sessions
• Pitfalls of Vertical Depth Conversion
• Understand accuracy of vertical time-to-depth methods and when they fail
• Extreme geologic regimes
• Shallow velocity anomalies and overpressure
• Problem sets and interactive work sessions
• Well-Seismic Database Validation
• Appreciate the need to review and correct the database prior to incorporating well control
• Confirm database settings
• Review seismic data polarity, phase, and synthetic correlations
• Using basic depth-conversion QCs to encounter data discrepancies
• Extensive exercises on detecting and correcting errors and inconsistencies in the database
• Appreciate the impact of anisotropy on seismic velocities and imaging
• Seismic anisotropy
• Parameterization (Vz, delta, epsilon, VTI/TTI)
• Problems and promise of anisotropy for velocity definition and seismic attributes
• Discuss impact of anisotropy on depth conversion and imaging
• Depth Migration and Well Calibration
• Learn basic approach for stable integration of depth-domain seismic (PSD) with well control
• Conversion of time data to calibrated depth
• Petrel Models and Uncertainty Analysis
• Implement domain conversion and uncertainty analysis with Petrel Velocity and 3D Models

Evaluating depth error on structure and well prognoses
• Impact of structural uncertainty on volumetrics in 3D Models
• Various Petrel exercises

AUDIENCE
Geoscientists involved in seismic interpretation and subsequent time-to-depth conversion and individuals performing well calibration of depth migration data and other attributes prior to reservoir modeling.

PREREQUISITE
Petrel Fundamentals and Petrel Geophysics courses.

AVO and Seismic Inversion
Foundation – 3 Days
This course, which covers the use of AVO and inversion techniques, helps to create the best possible petrophysics subsurface model available. A profitable development of an oil or gas field begins with a good understanding of the subsurface as a basis for efficient and successful field management. Improved discrimination of reservoir units is made and models are generated using logs and seismic data, leading to highly accurate or highly probable (static) subsurface models compatible (if correctly up-scaled) to dynamic reservoir models obtained from reservoir engineering measurements and computations. The correct use of seismic attributes, well data analysis, AVO, and seismic inversion is essential to establish subsurface models that can be used for improved field development planning and design. The course contains Petrel platform exercises to reinforce learning; however, no prior Petrel platform experience is required. At the end of the course, attendees will understand basic concepts in quantitative seismic analysis and interpretation based on AVO, well-to-seismic calibration, and inversion techniques. The attendees will consolidate their understanding of modern technology with recent field study examples and practical workshop exercises.

COURSE CONTENT
• Introduction
• Seismic Processing for AVO and Inversion
• AVO Theory Practical applications of AVO analysis – fluid factor, intercept and gradient etc.
• Well to seismic ties and wavelets
• Inversion theory and methods
• Low frequency model building
• Practical applications of seismic inversion - including lithology discrimination and rock physics inversion.
• 4D Inversion
• 3C Inversion
• Stochastic Inversion
• Future directions – joint EM-seismic inversion, AVAZ, VSP inversion, full waveform

AUDIENCE
Geologists, petrophysicists, reservoir engineers, processing geophysicists and seismic interpreters involved with exploration and development of oil and gas reservoirs.

PREREQUISITE
Basic knowledge of applied geophysical principles and seismic interpretation.
# Petrophysics

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

## Software Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Software</th>
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<tbody>
<tr>
<td>Petrophysical Property Mapping</td>
<td>Open Hole Log Interpretation</td>
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<tr>
<td>Applied Capillary Pressure and Saturation</td>
<td>Advanced Formation Evaluation in Carbonates</td>
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<tr>
<td>Height Modeling</td>
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<tr>
<td>Applied Reservoir Petrophysics and</td>
<td>Advanced Formation Evaluation in Sandstones</td>
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<tr>
<td>Characterization</td>
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</tr>
<tr>
<td>Rock Physics - Integrating Petrophysical,</td>
<td>Advanced Formation Evaluation in Carbonates, Clastics and Basement Rock</td>
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<tr>
<td>Geomechanical, and Seismic Measurements</td>
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</tbody>
</table>

## Domain Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Foundations</th>
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</thead>
<tbody>
<tr>
<td>Practical Acoustics with Techlog -</td>
<td>Petrophysics</td>
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<tr>
<td>Applications for Geomechanics and</td>
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<tr>
<td>Petrophysics</td>
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<tr>
<td>Advanced Core and Log Interpretation</td>
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<tr>
<td>Applied Core Analysis - How to Interpret</td>
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<tr>
<td>Core Data</td>
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<tr>
<td>Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrol</td>
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<tr>
<td>Integrated Wellbore and Reservoir Analysis: From Pore to Well Test Scale</td>
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<tr>
<td>Petrophysics Aspects of Shale Gas</td>
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<tr>
<td>Integrated Reservoir Analysis</td>
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<tr>
<td>Statistics and Petrophysics</td>
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<tr>
<td>Fundamentals of Geology and Basic Core</td>
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<tr>
<td>Analysis</td>
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<tr>
<td>Practical Wireline Logging for Geoscientists</td>
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<tr>
<td>Tool Physics- Standard Logging Tools</td>
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<tr>
<td>Well Placement Fundamentals</td>
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<tr>
<td>Practical Petrophysics with Techlog</td>
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<tr>
<td>Petrophysics for Drilling Engineers</td>
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<tr>
<td>Coring, Core Processing, and Wellsite</td>
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<tr>
<td>Handling</td>
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<tr>
<td>Introduction to Petrophysics</td>
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</tbody>
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## Competency Levels

- **Advanced**
  - Advanced Production Logging
  - Advanced Reservoir Monitoring
  - Applied Production Logging and Reservoir Monitoring
  - Intermediate Production Logging and Reservoir Monitoring

- **Skill**
  - MWD and LWD Tool Physics and Applications
  - Tool Physics - High Technology Imaging and Logging Tools
  - Advanced Carbonate Petrophysics From Pores to Logs
  - Petrophysics, Quick Look and Log Quality Control
  - Formation Pressure Evaluation: Acquisition and Interpretation

- **Foundation**
  - Basic Reservoir Monitoring
  - Basic Production Logging
  - Cased Hole Logging and Formation Evaluation
  - Tool Physics- Standard Logging Tools
  - Introduction to Production Logging and Reservoir Monitoring
Petrophysics

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<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>SOFTWARE</th>
<th>INTEGRATED/BLENDERED</th>
<th>VIRTUAL CLASSROOM</th>
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<tbody>
<tr>
<td>COMPETENCY LEVEL</td>
<td>Techlog</td>
<td>Petrel</td>
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<tr>
<td>ADVANCED</td>
<td>3D Petrophysics for High Angle Well Evaluation</td>
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<td>Techlog for Unconventional Shales Evaluation</td>
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<td>Techlog Thin Bed Analysis using the LowReP method</td>
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<td>Techlog Processing and Interpretation of Quanta Geo Images</td>
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<td>Techlog Processing and Interpretation of Quanta Geo Images with Techlog Fundamentals</td>
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<td>Techlog Reservoir Petrophysics</td>
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<td>Techlog for Geologists</td>
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<td></td>
<td>Techlog Borehole Image Interpretation</td>
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<td></td>
<td>Techlog Formation Evaluation with Quanti.Elan</td>
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<tr>
<td>SKILL</td>
<td>Techlog Saturation Height Modelling</td>
<td>Petrel Advanced Wells</td>
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<td></td>
<td>Techlog Formation Evaluation</td>
<td>Petrel Property Modeling</td>
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<tr>
<td></td>
<td>Techlog Acoustics Processing and Interpretation</td>
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<td></td>
<td>Techlog Formation Pressure Analysis</td>
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<td></td>
<td>Techlog for Pipe and Well Integrity Evaluation</td>
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<tr>
<td></td>
<td>Techlog Cased Hole formation evaluation</td>
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<tr>
<td>FOUNDATION</td>
<td>Techlog Python</td>
<td>Petrel Well Correlation</td>
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<tr>
<td>AWARENESS</td>
<td>Techlog Fundamentals</td>
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<tbody>
<tr>
<td>Petrophysical Property Mapping</td>
<td>Production Logging and Reservoir Monitoring</td>
<td>Capillary Pressure and Saturation Height Model Concepts For Reservoir Petrophysics</td>
<td>Foundation</td>
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<table>
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<tr>
<th>COMPETENCY LEVEL</th>
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</table>
Applied Capillary Pressure and Saturation Height Modeling

Foundation – 5 Days

This applied course teaches the attendee how to use capillary pressure data to help understand what is controlling the fluid distribution, the importance of pore geometry, and why water saturation is not an accident. Case studies and workshops on bimodal carbonates are used to demonstrate the challenges associated with interpreting fluid distributions. To understand many carbonates, it is necessary to examine capillary pressure, HP/MI laboratory nuclear magnetic resonance, thin-sections, and scanning electron microscope (SEM) images. Clastic studies and core-log integration workshops are used to illustrate how simple saturation height models can be applied in field studies of numerous parameters such as fluid contacts and hydrocarbon column height to help determine the dominant hydrocarbon-water contact. A large number of workshops are used in this course, allowing the attendees to gain hands-on experience in interpreting capillary pressure data.

COURSE CONTENT

- Pore geometry and wettability
- Drainage and imbibition capillary pressure data
- Fluid contacts and free-water level
- Measurement methods and options
- Converting from laboratory conditions to height
- Introduction to petrophysical rock types
- Saturation height models to predict saturation distribution

AUDIENCE

Any geologist, petrophysicist, or engineer who needs to understand fluid contacts, the free-water level, and why water saturation is not an accident.

PREREQUISITE

A basic understanding in using Microsoft Excel to make calculations and plots.

Advanced Formation Evaluation in Carbonates

Advanced – 5 Days

This course includes the geology of carbonates and the principles and effects of dolomitization. The physics and applications of a select number of logging tools with special applications for carbonate interpretations will include NMR imaging, MR Scanner® expert magnetic resonance service, and the Acoustic Scanner imaging service to quantify vugs and fractures. New developments in wireline and LWD neutron logging to provide both lithology and sigma capture cross section measurements will be discussed. Other services that will be discussed include dielectric measurements to assist in obtaining m and n, using the standard dielectric and the Dielectric Scanner® multifrequency dielectric dispersion service. The log interpretation in carbonates portion of the course will cover the following: Variable m and the formation factor wettability and variable n from log effects of vugs and fractures; dual porosity, macroporosity, and microporosity for quantitative evaluation of the dual porosity in carbonates. A new approach for interpretations in carbonates without the use of the Archie Equation will also be covered. The pore geometry and flow units course section covers capillary pressure measurements and capillary pressure obtained from NMR J-factor applications. Flow units apply modified Lorenz principle for petro-rock typing.

COURSE CONTENT

- Carbonate geology and deposition
- Nuclear magnetic resonance and NMR-Scanner
- Acoustic measurements and the acoustic scanner
- Borehole imaging
- Physics of neutron logging and dielectric logging
- Variable-m and the formation factor applications
- Wettability and the variable-n
- Effect of vugs and fractures on resistivity measurements
- Quantitative evaluation of the dual porosity in carbonates
- Permeability estimations
- Connectivity Theory
- Flow Units and the Lorenz plots
- Capillary Pressure from core analysis and NMR T2 conversion
- The J-Function
- Rock types: Winland and the ADNOC function

AUDIENCE

Extremely useful to petrophysicists, reservoir engineers, and geologists working in carbonate reservoir environments.

PREREQUISITE

None

Advanced Production Logging

Advanced – 5 Days

This is a 5-day course for attendees with a solid background and some experience in production logging. The attendees should have attended the Cased Hole Production Logging and Reservoir Monitoring Course. This course will focus on extending the level of the earlier cased hole course through in-depth evaluations of 2- and 3-phase flow in tubulars in workshop environments to alleviate the level of exposure to advanced and more complex production systems. Local examples will be reviewed and used as a working basis for such a session. The course will also review the various types of reservoir fluids and will investigate in detail near-wellbore formation damage and the concept of positive and negative skin. This investigation is intended to help analyze the productivity index (PI) of each zone in commingled production and analyze underperforming wells. Reservoir saturation monitoring will be presented in in-depth details with an emphasis on the principles of the tools and their measurement accuracies. Carbon/oxygen ratio calibrations will also be analyzed in detail and an interpretation workshop will also be given using local examples. The course will highlight the applications of this technique in estimating water saturations behind the casing and the salinity of invading water. Behind-casing formation resistivity will also be reviewed in detail and the results compared with the carbon/oxygen ratio and pulsed neutron logging applications.

COURSE CONTENT

- Reservoir fluids
- Formation damage
- Advanced production log interpretations
- Measuring fluid velocities
- Measuring hold-ups
- Classical examples of 2- and 3-phase flow domains
- Advanced production log interpretation workshop
- Saturation monitoring and water salinities
- Saturation monitoring workshop
- Cased hole formation tester
- Visit an operation base and/or the training centre

AUDIENCE

Production and reservoir engineers and production technologists who have to work on reservoirs.

PREREQUISITE

Average level of experience in the use of cased hole log interpretations.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
**Applied Reservoir Petrophysics and Characterization**

**Advanced – 7 Days**

Through dynamic modeling, attendees gain an advanced understanding of applied reservoir petrophysics and characterization using integration of data at the pore scale. The attendees will learn how to exploit interpretation techniques to spot exploration opportunities, such as bypassed pay and new resources in existing fields in addition to learning how to improve dynamic simulation modeling through integration of petrophysical data. Attendees study advanced permeability and capillary saturation models, and construct a wellbore numerical simulation based on facies, petrophysical rock types, and NEXT QuickScan-based flow units.

**COURSE CONTENT**

- Petrophysical rock types
- Water saturation (Sw) and impact of capillary pressure and rock electrical properties
- Comparison of log-based Sw relationships
- Permeability prediction and capillary saturation workflows with example model construction
- Height function and Thomeer approaches
- Drainage and imbibition relative permeability curves and their relationship to wettability
- Wellbore simulation using petrophysical rock types, facies, and flow unit
- Recovery factor simulation based on petrophysical data
- Application of field-study flow units

**AUDIENCE**

Petrophysicists, geoscientists, and engineers responsible for advanced reservoir characterization and modeling.

**PREREQUISITE**

Basic understanding of reservoir characterization and petrophysics.

**Advanced Formation Evaluation in Sandstones**

**Advanced – 5 Days**

This course includes geology of clastics reservoirs and tectonic activities. GR and SP tool physics and applications in estimating clay volume, clay type, and formation water salinities will be presented. In the area of acoustics, tool physics and applications for rock mechanics; well bore stability, and sandstone compaction in addition to applications of acoustics for predicting high-pressure zones. The physics and applications of the Sonic Scanner® acoustic scanning platform are presented for evaluating anisotropy. Nuclear log data and tools include density, photoelectric, and neutron tools theory and applications to clastics reservoir.

Detailed applications of the density-neutron include crossplot for estimating the volume of clay (Vcl, Vsh) and the trends in silt, laminated shale, and dispersed shale. Core analysis is used to obtain porosity and permeability. Shale analysis is performed using elemental capture spectroscopy to provide evaluations of lithology and shale volume in addition to dispersed and laminated shales. CEC and its applications in the Waxman-Smits equation, detailed derivation of the dual-water equation, and comparison with the Waxman-Smits and modified Waxman-Smits equations are presented. Log interpretation in clastics is covered by presenting the derivation and applications of the various shaly sand equations, both the empirical versions (e.g., Indonesia, Nigeria, etc.), and the excess conductivity equations (e.g., Waxman-Smits, dualwater, etc.).

Permeability estimations in clastics reservoirs include pore geometry and flow units in addition to capillary pressure measurements, and capillary pressure obtained from NMR J-Factor applications, and flow units by applying the modified Lorenz principle to petro-rock typing.

**COURSE CONTENT**

- Geology of clastics reservoirs
- Gamma ray and spontaneous potential logs

- Core analysis to obtain porosity and permeability
- Determine effective porosity, shale volume and total porosity
- Determine sand compaction and mechanical properties
- Shale analysis
- CEC analysis
- Evaluations of dispersed and laminated shale
- Shaly sand equations
- Rock pore type and flow units
- Capillary pressure analysis
- Rock pore type in clean sands
- Flow units and the use of the Lorenz plot

**AUDIENCE**

Suitable for all geoscientists and engineers who will benefit greatly from exposure to advanced knowledge and expertise in formation evaluations in clastics.

**PREREQUISITE**

None

**Well Integrity - Cased Hole Logging and Monitoring**

**Advanced – 5 Days**

- Introduction to Well Integrity
- Why Well Integrity
- Problems causing well integrity
- Depth control
- Well Head Pressure Control
- Leak Detection using: Noise logs
- Temperature logs
- Oxygen activation to measure water flow
- Communication Testing to check zonal isolation
- Uneven Depletion: Causes of uneven depletion
- Modelling of uneven depletion
- Estimating the inter-zone cross-flow caused by uneven depletion
- Spinner Calibrations
- Estimating zone flows, Productivity index (PI) and reservoir pressure (Pr) for each zone
- Optical Distributed Temperature
- Permanent temperature sensors
- Primary Cementing
- Squeeze Cementing
- Cement Evaluation Tools
- CBL-VDL
- Ultrasonic
- Isolation Scanner (Rotating Flexural wave)
- Corrosion Monitoring
- Corrosion Mechanisms
- Corrosion Monitoring Tools
COURSE OFFERINGS

- Cathodic Protection
- Perforation Conveyance
- Perforations Efficiency

IMMERSIVE LEARNING PROGRAMS

- Effect of stress on seismic body waves
- Third-order elasticity
- Granular media and discrete element methods
- Displacement discontinuity methods
- Stress sensitivity of sandstones
- Stress sensitivity of shales
- Stress perturbations around a borehole
- Determination of velocity variations around a borehole from advanced sonic logging
- Application to wellbore stability
- Reservoir geomechanics and stress effects in 4D seismic monitoring
- Fractured reservoirs
- Hydraulic fracture propagation in presence of natural fractures
- Seismic characterization of fractured reservoirs
- Modeling the response of a fractured reservoir
- Rock physics models for fractures
- Shales and unconventional reservoirs
- Anisotropy of shales
- Rock physics modeling of kerogen in organic-rich shales
- Effect of anisotropy on AVO
- Microseismic and effect of azimuthal anisotropy on propagation of hydraulic fractures

AUDIENCE

Geoscientists, petrophysicists, and engineers with a need to understand rock physics and learn how to work together in integrated teams to build geomechanical models.

PREREQUISITE

Basic knowledge of geology, geophysics, and petrophysics.

COMPETENCY MANAGEMENT

ADVANCED FORMATION EVALUATION IN CARBONATES, CLASTICS, AND BASEMENT ROCK

Advanced – 5 Days

This course includes geology of carbonates and clastics, core analysis to obtain porosity and permeability, shale analysis, in which elemental capture spectroscopy provides evaluations of lithology, shale volume, dispersed and laminated shales, and definition and measurement of the CEC. TB and LRP zones are evaluated using various techniques, including borehole imaging, NMR, and RI Scanner. This course also covers log interpretations in clastics, including the various shaly-sand equations, both the empirical versions (e.g., Indonesia, Nigeria, etc.) and the excess conductivity equations (e.g., Waxman-Smits, Dual Water, etc.). Permeability estimations in clastics reservoirs and geology and petrophysics of basement rock will be presented. Log interpretations in carbonates covers the following topics: variable m and the formation factor wettability and variable n from the effects of vugs and fractures. Macro and microporosity permeability estimations in carbonates will be discussed as well as pore geometry and flow units, capillary pressure measurements, and capillary pressure obtained from NMR J-Factor applications and flow units by applying the modified Lorenz principle for petro-rock typing.

COURSE CONTENT

- Geology of carbonates and sandstones
- Core analysis
- Shale analysis
- Laminated and dispersed shale
• CEC from cores and logs
• TB evaluations and low-resistivity pay zones
• Water saturation computations
• Empirical shaly sand equations
• Excess conductivity equations
• Permeability estimations in clastics
• Log evaluations in carbonates
• Variable m and n
• Formation factor applications
• Microporosity
• Permeability estimations in carbonates
• Geology and petrophysics of basement rock
• Concept of probabilistic interpretations (e.g., ELANPlus* advanced multimineral log analysis, and Techlog platform software.)
• Flow units using modified Lorenz plot
• Rock-pore type

**AUDIENCE**

Suitable for all geoscientists and engineers who will benefit greatly from exposure to advanced knowledge and expertise in formation evaluations in carbonates, clastics and basement rock.

**PREREQUISITE**

None

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**Advanced Reservoir Monitoring**

**Advanced – 5 Days**

This immersive workshop teaches you how to interpret your most difficult reservoir monitoring scenarios and to diagnose unique reservoir behaviors not included in classical interpretation techniques. Focused on reservoir monitoring logging techniques, this course teaches you specific strategies for the use and interpretation of pulsed neutron logging, formation resistivity measurements (Rt) behind steel and non-conductive casing, pressure measurements, and fluid sampling behind casing.

**COURSE CONTENT**

- Reservoir fluids
- Reservoir drive mechanisms
- Inflow and outflow performance
- Justifying running reservoir monitoring logs
- Nuclear physics of reservoir monitoring and pulsed neutron logging (PNL)
- PNL tools and scintillation detectors
- PNL for Capture cross section measurements
- PNL for Carbon/Oxygen (C/O) logging applications
- Combined capture and inelastic modes to monitor injection water sweep
- Log-Inject-Log to estimate Residual Oil Saturation
- Gravel pack monitoring
- Stand-alone PNL data acquisition and interpretations in wells with limited data
- Cased Hole Formation Resistivity behind steel casing
- Formation resistivity behind non-conductive casing
- Pressure measurements and sampling behind casing

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**Applied Production Logging and Reservoir Monitoring**

**Advanced – 5 Days**

Encompassing advanced techniques for production logging and reservoir monitoring, this course teaches attendees the design of a data-acquisition program for evaluation of wellbore or reservoir behavior based on field development objectives. Hands-on examples demonstrate in-depth log interpretation techniques for resistivity measurements acquired behind casing, three-phase flow in horizontal wells, and fluid saturations. Attendees will learn quicklook techniques for log quality control as well as how to plan and integrate multisource data for a more complete evaluation.

**COURSE CONTENT**

- Inflow and outflow performance and productivity
- Flow regimes and slippage velocities in vertical, deviated, and horizontal wells
- Various techniques of measuring of oil, water, and gas velocity
- Measurement of three-phase holdups using electrical and optical sensors
- Spinner calibrations in vertical, deviated, and horizontal wells
- Three-phase production logging in horizontal wells
- Physics of pulsed neutron and carbon/oxygen logging
- Pressure data and formation fluid sample acquisition behind casing
- Workshop: Use of capture and carbon/oxygen modes for evaluating water and gas saturations
- Workshop: Interpreting resistivity logging measurements acquired behind casing
- Workshop: Production logging in horizontal wells with three-phase flow

**AUDIENCE**

Professionals with geoscience background and minimum of 2 years of exposure to field production.

**PREREQUISITE**

More than 2 years of experience interpreting reservoir monitoring logs is recommended.

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**Advanced Integrated Reservoir Analysis**

**Skill – 10 Days**

The use of a subsurface integration model can resolve reservoir problems that range from petrophysical rock typing to log analysis. In this course, attendees will learn how to perform an integrated analysis of rock, pore, and fluids data and how to solve problems associated with identifying and exploiting reserves. The attendees will apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques in addition to learning how to identify lithologic zones and fluid types from log data, follow simple procedures for rapid and accurate interpretation, and apply correlations to core and petrophysical rock type zonation to upscale log data for reservoir simulation applications. Course materials cover advanced interpretation for better understanding of dataset limitations and measurement requirements for effective reservoir development; reservoir drive mechanisms, recovery factor, and simulation models. The attendees will gain experience with NExT QuickScan and quick-look techniques through in-class exercises.
COURSE CONTENT

- Integrated reservoir analysis overview and case histories
- Petrophysical rock types and flow units
- Principles of saturation distribution and capillary pressure from laboratory data
- Quicklook analysis and interpretation techniques
- Saturation calculations
- Tool corrections for resistivity and Rxo measurements, and tornado chart corrections
- Porosity measurements (sonic, neutron, and density)
- Capillary pressure and electrical rock properties
- Quicklook carbonate and shaly sand analysis
- Advanced log analysis

AUDIENCE

Petrophysicists, geoscientists, and engineers responsible for wellbore diagnostics or reservoir characterization who rely on core interpretation and other integrated petrophysical data for decisions and analyses.

PREREQUISITE

Basic understanding of geological concepts and reservoir characterization.

Intermediate Production Logging and Reservoir Monitoring

Skill – 5 Days

This course provides attendees with in-depth instruction on cased hole logging tool physics, interpretation, and QC techniques for wellbore-specific production logging and reservoir monitoring scenarios. Attendees learn how and when to use these tools to meet logging objectives and quicklook techniques for identifying log QC problems. Using hands-on examples, the attendees learn to interpret behind-casing resistivity data and measure three-phase flow using production logs.

COURSE CONTENT

- Inflow performance and productivity index for oil wells and gas wells
- Outflow performance: Matching inflow with outflow to optimize productivity
- Flow regimes in vertical, deviated, and horizontal wells
- Techniques for measuring individual fluid velocities of oil, water, and gas
- Three-phase holdups from electrical and optical sensors
- Production logging in horizontal wells
- Pulsed neutron log physics, capture cross section, and carbon/oxygen logging
- Cased hole formation resistivity data
- Workshops: Capture mode for evaluating water and gas saturation; Interpreting behind-casing resistivity logs; three-phase flow

AUDIENCE

Petrophysicists and engineers responsible for wellbore diagnostics or reservoir monitoring who want a detailed understanding of cased hole logging tools.

PREREQUISITE

Basic Production Logging and Reservoir Monitoring course or more than 1 year of experience with applied cased hole logging.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Skill – 5 Days

This course starts by teaching the fundamentals of acoustic waveform propagation in a borehole and how the waveforms recorded by an array sonic tool can be processed and interpreted to obtain valuable quantitative information about the petrophysical and mechanical properties of the rocks. The course contains several practical exercises using Techlog in which the participants will be able to load real sonic data from Wireline and LWD sonic tools and QC the quality of the raw waveforms, as well as the main products such as slowness projections and slownesses.

COURSE CONTENT

- Fundamentals of acoustic logging
- Overview acoustic logging and its applications in the oil & gas industry
- Fundamentals of borehole acoustics and wave propagation theory
- Understand sonic tool hardware with examples from different Wireline and LWD tools
- Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc).
- Import DLIS data containing sonic waveforms and use Techlog to assign tool-specific properties
- Slowness processing workflows
- Theory of semblance processing and slowness estimation from array waveform data
- Non-dispersive slowness time coherence (STC) processing workflow
- The importance of dispersion analysis for identifying best processing parameters
- Dispersive STC (DSTC) for dipole data
- Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
- High-resolution (multiple shot) processing
- Sonic processing workflows
- Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
- Quadrupole shear and its applications
- Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
- Processing slownesses in challenging environment: Leaky-P processing
- Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
- Anisotropy analysis and its applications
- The concept of anisotropy in the earth and how it is measured
- The different mechanisms of acoustic anisotropy and their applications in the oil&gas industry
- Understand and apply the four-component rotation workflow using cross-dipole sonic waveforms (preprocessing, filtering, processing)
- Anisotropy analysis finalization and presentation (including angle swapping when necessary)
- Understanding the shale anisotropy and how to characterize it using sonic data
- Applications of anisotropy to Drilling and completion applications (stress direction, fractures, shale anisotropy, etc)
- Applications of Acoustic interpretation to Geomechanics, Geophysics and Petrophysics
- Case study for an exploration well: run anisotropy analysis on an exploration workflow and derive the main acoustic outputs for geomechanics and petrophysics applications.
- Petrophysics applications of sonic data (sonic porosity, Stoneley permeability, etc)
- Geophysics applications of sonic data

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
AMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

Includes practical sessions

COURSE OFFERINGS

Skill – 6 Days

Advanced Core and Log Interpretation

In this course, attendees will learn the impact that laboratory-based core data have on formation evaluation and understand the wellbore data that are required for an integrated model of the reservoir at the wellbore scale. Instruction covers the key objectives of core-log calibration, including porosity, lithology, saturation, and petrophysical rock types, and makes use of core-to-log calibration workshops. In a workshop setting, attendees will increase their understanding of how the integration of lithology, pore geometry, porosity, permeability, and water saturation can improve a static reservoir model.

COURSE CONTENT

• Core-log integration workflow
• Core and log integration and depth shifting
• Fundamentals of log analysis using NEXT 4-Line interpretation method
• Texture of matrix and pore system in context of geologic framework and lithology calibration
• Porosity: Total, effective, and clay parameters (wet, dry)
• Estimating fluid holdup, two- and three-phase flow estimation

AUDIENCE

Petrophysicists, geoscientists, or engineers.

PREREQUISITE

A 2-year technical degree and an understanding of well operations.

Skill – 5 Days

Applied Core Analysis: How to Interpret Core Data

Increase your understanding of petrophysical properties as applied to the interpretation of reservoirs from a core analysis perspective. This comprehensive course provides attendees with detailed instruction on basic petrophysics, measurement methods, and the controls over porosity, permeability, fluids, wettability, and relative permeability data analysis. The attendees investigate and understand the source of petrophysical data errors through hands-on correlation of a sample log; a core dataset is analyzed and the saturation-height model is created.

COURSE CONTENT

• Quick-look hydrocarbon identification methods and water resistivity (Rw), oil resistivity (Ro) and apparent water resistivity (Rwa)
• Log Sw using Archie-based techniques: Variable m method
• Use of capillary pressure data for calibrating water saturation
• Petrophysical rock types
• Permeability prediction

AUDIENCE

Petrophysicists, geoscientists, engineers, log analysts, and other subsurface professionals responsible for exploitation or early field development projects.

PREREQUISITE

None

Skill – 5 Days

MWD and LWD Tool Physics and Applications

This course covers the basics of measurement while drilling (MWD) and LWD. The basics include signal processing and tool combinations, MWD data acquisition, LWD tool, physics, and applications for integrated log data acquisition that includes neutron spectroscopy, Sigma capture cross section, resistivities, density-photoelectric cross section, GR, and borehole caliper imaging. This course covers the basics of measurement while drilling LWD NMR while drilling, LWD laterolog and induction resistivity measurements, LWD borehole imaging, LWD geosteering tool physics and applications are also presented.

COURSE CONTENT

• MWD-LWD principles and data transmission
• Integrated log data
• Sourceless density and neutron logging
• Acoustic and seismic measurements
• Formation pressure
• Magnetic resonance imaging
• Laterolog and induction resistivity measurements
• LWD borehole imaging GeoSteering physics and applications
• Borehole imaging as an aide for GeoSteering

AUDIENCE

Petrophysicists, geoscientists, engineers, or geologists.

PREREQUISITE

A working knowledge of Microsoft Excel software and a basic understanding of statistics.

Skill – 6 Days

Openhole and Cased Hole Data Acquisition and Interpretation

This course covers openhole, cased hole, and production logging tools and their applications. Attendees will learn openhole logging tool principles, interpretation of log data using quick technique workshops, and how to interpret data from complex shale bearing formations. Instruction includes cased hole logging applied to reservoir monitoring problems, how to evaluate production problems and two- and three-phase flow rates using production logging tools in vertical, deviated, or horizontal wells. The attendees will use actual field log data in exercises to learn these techniques, including log quality control workflows.

COURSE CONTENT

• Basics of logging
• Reservoir rock and fluid properties
• Openhole logging tool principles and types and interpretation techniques
• Cased hole evaluations
• Well integrity: CBL-variable density log, ultrasonic, slim cement mapping tool, Isolation Scanner* cement evaluation service
• Casing corrosion principles: Ultrasonic, multifinger calipers, electromagnetic (ETT)
• Reservoir monitoring: Inelastic capture, carbon/oxygen ratios, pulsed neutron capture tools, cased hole formation resistivity
• Production logging principles and tools: Optical and electric sensors, flowmeters, FloScan Imager
• Estimating fluid holdup, two- and three-phase flow estimation

AUDIENCE

Petrophysicists, geoscientists, or engineers.

PREREQUISITE

A 2-year technical degree and an understanding of well operations.

Skill – 5 Days

Applied Core Analysis: How to Interpret Core Data

Increase your understanding of petrophysical properties as applied to the interpretation of reservoirs from a core analysis perspective. This comprehensive course provides attendees with detailed instruction on basic petrophysics, measurement methods, and the controls over porosity, permeability, fluids, wettability, and relative permeability data analysis. The attendees investigate and understand the source of petrophysical data errors through hands-on correlation of a sample log; a core dataset is analyzed and the saturation-height model is created.

COURSE CONTENT

• Reservoir geology

AUDIENCE

Anyone who desires an increased understanding of acoustic data from sonic tools and how to integrate them into their workflows.

PREREQUISITE

Basic understanding of geoscience and petroleum engineering
Tool Physics of High-Technology Imaging and Logging Tools

Skill – 5 Days

This course covers the physics of all of the available advanced imaging logging tools. Included is the concept of the forward modeling and inversion WFT tool, the wide applications, tool hardware, and applications in low-permeability zones using straddle packers. The Pressure Gradient Analysis Sampling Optical Spectroscopy provides hydrocarbon composition information. New developments in LWD tools include sourceless logging to obtain density, Pe, neutron porosity, and resistivity measurements while logging. Neutron logging, nuclear physics of neutron interaction with the formation, advances in neutron logging, reservoir monitoring using carbon/oxygen tools, borehole imaging for geological modeling, structural and stratigraphic features, fracture evaluations using microresistivities, ultrasonic imaging Cross-Well Electromagnetic Imaging Scanner Family of radial and circumferential imaging. This course also covers Dielectric Scanner logging, NMR Scanner Imaging, Resistivity scanner to give vertical resistivity (Rv) and horizontal resistivity (Rh), and Acoustic Scanner Formation Resistivity measurements behind the casing.

COURSE CONTENT

• Forward modeling and inversion
• Optical spectroscopy
• New developments in LWD
• Neutron logging
• Borehole imaging
• Scanner family of radial and circumferential imaging
• Resistivity scanner and acoustic scanner
• Formation resistivity measurements behind the casing

AUDIENCE

Suitable for experienced engineers in all technical areas of the oil and gas industry who need a solid base to be up to date and understand the applications of this technology.

PREREQUISITE

None
Advanced Carbonate Petrophysics from Pores to Logs

Skill – 5 Days

This is a hands-on course focused on why pore geometry must be the focal point for carbonate petrophysical analysis. Attendees will work with petrographic information, mineralogy data, routine core analysis, capillary pressure, electrical rock properties, nuclear magnetic resonance, and openhole logs. The importance of core-log integration and cross calibration is shown as well to reduce the uncertainty of computed reservoir properties. Petrophysical property analysis is often the key to building a static reservoir description; however, in carbonates, a model that is not cross calibrated from core to logs to seismic may result in a large statistical uncertainty.

COURSE CONTENT

- Carbonate pore geometry
- Overview of carbonate systems
- Total and effective porosity
- Lithology and mineralogy
- Core-log calibration (lithology, porosity (PHI), permeability (PERM), Sw)
- Quicklook log analysis (lithology, PHI, Sw, PERM)
- Why petrophysical rock types are important
- Applied capillary pressure
- Log-based Sw
- Applied flow units

AUDIENCE

Any subsurface professional working on early field development, static model building, or advanced recovery methods in carbonates.

PREREQUISITE

Basic knowledge of carbonate depositional systems, lithology, and pore geometry.

Integrated Wellbore and Reservoir Analysis: From Pore to Well Test Scale

Skill – 5 Days

This course helps attendees develop subsurface skills for integrated analysis of rock, pore, well test, and fluids to solve problems associated with identifying and exploiting reserves. Experience gained will allow the attendees to apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques. A subsurface integration process model is presented that provides a multidiscipline methodology for solving reservoir problems, from facies, petrophysical rock typing, flow unit, and the basics of well test information for a better understanding of reservoir characterization and the input required for a reservoir model.

COURSE CONTENT

- Generic integrated workflow process
- Integration of geology, facies, and petrophysical rock types
- Total and effective porosity
- Basics of core-log integration
- Applied capillary pressure, wettability, and relative permeability
- “Water saturation is not an accident…”
- Upscaling from pore throat radius to petrophysical rock type to flow units
- Introduction to saturation height modeling
- Petrophysics: key to success in a static or dynamic model
- Relationship between the free-water level, various contacts, pore throat radius, wettability, and saturation distribution
- Using pressure gradient analysis to establish the free-water level.
- Basic introduction to well test analysis and how the results can be integrated for an improved reservoir characterization

AUDIENCE

Geologists, geophysicists, reservoir engineers, production engineers, petrophysicists, and asset teams.

PREREQUISITE

A working understanding of geology, reservoir properties, and petrophysics.
- Resistivity measurements in the uninvaded zone using Induction and Laterolog
- The concept and applications of laterolog and induction array resistivity measurements
- Introduction to High Technology Tools
- Dielectric measurements
- Magnetic Resonance Imaging and its applications
- Borehole imaging
- Interpretation overview of important petrophysics parameters
- Estimating fluid salinities-Porosity-Lithology
- Wettability and the saturation exponent (n)
- Estimation of the volume of shale
- Computing the values of Sw using different techniques in clean and shaly formations.

**AUDIENCE**

This course will be suitable for all geoscientists and engineers who will benefit greatly from a strong foundation in petrophysics, logging tool physics and log interpretations.

**PREREQUISITE**

None

**Petrophysics Aspects of Shale Gas**

**Skill – 5 Days**

This 5-day course provides a general introduction to the use of well logs to evaluate organic shale reservoirs. The primary focus is on estimating basic components of reservoir quality, including total organic carbon (TOC), primary mineralogy, porosity, saturation, permeability, and hydrocarbons in place. Additional focus is on estimating basic components of completion, including quality and minimum horizontal stress for isotropic and anisotropic systems. The combination of the two criteria will be used to identify, qualify, and pick a lateral landing point for an organic shale.

The curriculum is designed for petroleum engineers and geologists with limited expertise in petrophysics. Most of the relevant algorithms can be estimated either with a calculator or instructor-provided spreadsheets. Organic shale logs will be evaluated using these tools throughout the week.

Goal will be for participants to determine viability of an organic shale as a reservoir with a basic well logging suite. With the inclusion of a sonic log, participants will be able to determine stress and the optimum lateral landing point for horizontal wellbores. The use of basic spreadsheets will be used to quantify reservoir and completion quality of a shale reservoir.

**COURSE CONTENT**

- Definition of productive organic shale reservoir
- TOC/kerogen identification and quantification
- Adsorbed gas quantification using Langmuir isotherm
- Quantification of mineralogy through log evaluation and relationship to producibility
- Porosity: effective versus total and estimation
- Hydrocarbon saturation calculation and accounting for clay water
- Estimation of pore gas hydrocarbons with adsorption correction
- Delineation of shale gas beds and identification of potential pay
- Determination of stress for completion design
- Estimation of producibility based on porosity, permeability, fractures, pressure, etc.
- Determination of lateral landing points using stress profiles and rock quality

**Formation Pressure Evaluation: Acquisition and Interpretation**

**Skill – 5 Days**

This course is designed to address all topics relating to formation pressure evaluation. The course will cover pressure measurements in open hole during the initial drilling phase of the well, and will then cover formation pressure measurements during the life of the field. Uneven depletion caused by production and variations in the productivity index of the various layers will result in uneven pressure variations and consequently fluid cross-flow - this will also be addressed in details. Variations in formation pressure between the various zones is important in optimising production and increasing recovery.

**COURSE CONTENT**

- Overview of open hole logging
- Parameters affecting invasion profiles
- Depth Control
- Porosity and lithology
- Resistivity measurements
- Computing porosity, volume of shale and water saturation
- Pressure measurements in Open Hole
- Well Head Pressure
- Wireline Formation Testing: Overview
- Modular Dynamic Tester: hardware and applications:
  - Tools and hardware functionalities
  - MDT run with standard logging tools
  - MDT used to estimate zone permeability
  - MDT pressure gradient analysis
- Modular Dynamic Tester: Hardware and applications- continues: Formation supercharging.
  - MDT Sampling.
  - MDT Optical spectroscopy.
  - Saturn-4 : Modern WFT tools.
- Modular Dynamic Tester: hardware and applications - continues:
  - MDT applications in depleted reservoirs
- Sampling and pressure monitoring behind casing
- Pressure measurements with the LWD during Drilling
- PVT Express: Wellsite fluid PVT analysis
- Production Logging Overview
- Production logging in depleted reservoir
- Estimating PI and Pr (layer pressure) for each zone
- Estimating uneven pressure variations and volume of cross-flow
- Well Testing and its applications: Estimating Permeability thickness
  - Reservoir pressure
  - Skin values

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Integrated Reservoir Analysis

**Foundation – 5 Days**

his course will help attendees develop subsurface skills for integrated analysis of rock, pore, and fluids and to solve problems associated with identifying and exploiting reserves. Experience gained will allow attendees to apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques. A subsurface integration process model is presented that provides a multidiscipline methodology for solving reservoir problems, from facies to petrophysical rock typing through flow unit characterization to reservoir modeling.

**COURSE CONTENT**

- Generic integrated workflow process
- Integration of geology, facies, and petrophysical rock types
- Total and effective porosity
- Basics of core-log integration
- Applied capillary pressure, wettability, and relative permeability
- "Water saturation is not an accident…"
- Upscaling from pore throat radius to petrophysical rock type to flow units
- Introduction to saturation height modeling
- Petrophysics: Key to success in a static or dynamic model
- Relationship between the free-water level, various contacts, pore throat radius, wettability, and saturation distribution

**AUDIENCE**

Geologists, geophysicists, reservoir engineers, production engineers, petrophysicists, and asset teams.

**PREREQUISITE**

Intermediate understanding of geology and petrophysics.

Basic Reservoir Monitoring

**Foundation – 5 Days**

In this course, attendees will study the basics of field surveillance and reservoir monitoring with tools such as pulsed neutron and carbon/oxygen logging. The attendees will learn how these tools are applied to diagnose reservoir-wide behaviors of water breakthrough, gas cap migration, and behind-pipe commingling. In an in-class workshop, attendees will learn to evaluate water and gas saturations and determine resistivity behind the casing.

**COURSE CONTENT**

- Reservoir-drive mechanisms and associated production problems
- Reservoir fluid properties: Gas/oil ratio, bubblepoint pressure, and three-phase diagram
- Tool conveyance using tractors and coiled tubing
- Depth control in cased hole wells using gamma ray and casing collar locator
- Completions in vertical, deviated, horizontal, and multilateral wells
- Pressure-control system for rigless operation

**AUDIENCE**

The course focuses on measurement of formation pressure and its variation with time, fluid sampling and fluid analysis. Reservoir engineers, production engineers and petrophysicists, at all levels of experience, will find this course very useful with direct applications to their operations.

**PREREQUISITE**

None

Basic Production Logging

**Foundation – 5 Days**

Production logging tools have specific uses as well as limitations. Attendees will learn the various applications for these tools, the interpretation assumptions that are integral to their designs, and how log quality is affected by the acquisition process. Hands-on demonstrations teach the fundamentals of production log interpretation, and an in-class workshop focuses on the interpretation of single- and two-phase flow. Discussion includes use of these logs for measurement of three-phase flow.

**COURSE CONTENT**

- Inflow and outflow performance and productivity index for oil wells and gas wells
- Tool conveyance using tractors and coiled tubing
- Depth control in cased wells using gamma ray and casing collar locator data
- Completions for vertical, deviated, horizontal, and multilateral wells

**Statistics and Petrophysics**

**Foundation – 5 Days**

Structured to provide a strong foundation in the use of statistics for petrophysical interpretation, this course provides attendees with the basis for building static 3D models. Attendees are introduced to the use of statistical distributions, various averaging methods, smoothing, curve fitting, and regression methods in addition to learning how to understand when a dataset is statistically significant and how statistics affect typical numerical transforms, such as total porosity, effective porosity, absolute permeability, lithology, and water saturation.

**COURSE CONTENT**

- Fundamentals of statistics as applied to petrophysics
- Significance of residual analysis and multilinear regression to improve quality of fit (R2)
- Improving fit by adding grain size, shale volume, gamma ray, lithology, and additional porosity devices
- Nonparametric approaches to evaluate nonstandard porosity-permeability relationships
- Mechanisms to control water saturation distributions
- Empirical methods to calculate Winland pore throat radius, petrophysical rock type, and log-computed water saturation

**AUDIENCE**

Petrophysicists, geoscientists, and engineers wanting a better understanding of statistics used in petrophysical interpretation.

**PREREQUISITE**

Basic understanding of reservoir characterization and petrophysics.

his course will help attendees develop subsurface skills for integrated analysis of rock, pore, and fluids and to solve problems associated with identifying and exploiting reserves. Experience gained will allow attendees to apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques. A subsurface integration process model is presented that provides a multidiscipline methodology for solving reservoir problems, from facies to petrophysical rock typing through flow unit characterization to reservoir modeling.

**COURSE CONTENT**

- Generic integrated workflow process
- Integration of geology, facies, and petrophysical rock types
- Total and effective porosity
- Basics of core-log integration
- Applied capillary pressure, wettability, and relative permeability
- "Water saturation is not an accident…"
- Upscaling from pore throat radius to petrophysical rock type to flow units
- Introduction to saturation height modeling
- Petrophysics: Key to success in a static or dynamic model
- Relationship between the free-water level, various contacts, pore throat radius, wettability, and saturation distribution

**AUDIENCE**

Geologists, geophysicists, reservoir engineers, production engineers, petrophysicists, and asset teams.

**PREREQUISITE**

Intermediate understanding of geology and petrophysics.
• Pressure-control system for rigless operation
• Reservoir fluids properties, including gas/oil ratio, bubblepoint pressure, three-phase diagrams
• Reservoir drive mechanisms and associated production problems
• Justification of production log acquisition
• Standard production logging tools
• Techniques for measuring oil, water, and gas rates
• Interpretation of logs for single-, two-, and three-phase production

AUDIENCE
Geoscientists or engineers responsible for interpreting production logs.

PREREQUISITE
Engineering or geosciences degree recommended as this course deals with the production logging physics.

Fundamentals of Geology and Basic Core Analysis
Foundation – 5 Days

Petroleum professionals need to understand the intrinsic reservoir properties that core and core analysis provides. Evidence of hydrocarbon presence, reservoir storage capacity, and flow capacity along with the distribution of porosity, permeability, and geological descriptive information can be directly obtained from core material. Participants in this course will learn about common coring objectives. Some topics that will be covered in this coring program include porosity, permeability, residual fluids, and lithology at micro-scale. Depositional and textural information, as well as reservoir connate water saturation will also be discussed during this course.

COURSE CONTENT
• Core Analysis in Petroleum Systems and Carbonate and Sandstone Environments
• Core analysis in petroleum systems
• Sandstone and carbonate depositional environments
• Coring process and the value of core analysis
• Core handling at the well-site
• Core Planning, Core Preparation, and Porosity
• Various core planning options
• Core cleaning and drying
• Porosity
• Porosity evaluation workshop
• Permeability, Net Mean Stress, and Sample Selection
• Core sampling workshop
• Reservoir evaluation
• Sandstone and carbonate case studies
• Optional tour of commercial “routine core analysis lab”
• Petrophysical Rock Types and Capillary Pressure
• Fundamentals
• Capillary pressure workshop
• High Pressure Mercury Injection (HPMI)
• HPMI and petrophysical rock types workshop
• Wettability
• Special Topics
• Scaling issues when comparing core data to logs
• Quality control workshop
• Core-log integration

AUDIENCE
The intended audience for this course includes geologists, petrophysicists, and engineers who are using core analysis in the development of geology or reservoir characterization.

PREREQUISITE
Participants in the course will need to know the basics of petrophysics and reservoir fundamentals.

Practical Wireline Logging for Geoscientists
Foundation – 5 Days

This course, an integrated wireline logging course for geoscientists that combines theory and practice, will be held at the Schlumberger Wireline Logging British Training Centre in Livingston, Scotland. The main objective of the course is to expose the attendees to both the practical and theoretical aspects of wireline logging data acquisition and applications. The theoretical and practical sessions will cover a wide range of tools such as resistivity, nuclear, sonic, borehole imaging, and nuclear magnetic resonance technology. The theoretical portion of the course will cover the tool physics, data acquisition procedures, log quality control, and a short workshop session on data interpretations. The workshop focus will be on interpretations in shaly sand formations, and various shaly sand equations used to estimate water saturation such as the Waxman-Smits and dual-water equations. No special software will be required. Logging operations will be performed under real conditions in the test wells at the Schlumberger Wireline Logging British Training Centre. The practical portion of the course involves hands-on connecting and running of logging tools in the hole, monitoring depth control, and the normal data acquisition procedure and log quality control. The course will be 50% in classroom and 50% on the well pad. Personnel protective equipment will be required during the practical sessions.

COURSE CONTENT
• Theory and workshops
• Tool conveyance, depth control, and log quality control
• Gamma ray spectroscopy: Applications for shale evaluations, clay typing and geological modeling
• Borehole imaging applications for structural and stratigraphic interpretations: microresistivity imaging in conductive muds and ultrasonic imaging in oil-base muds
• Density and neutron porosity log: theory and applications
• Gamma ray applications and borehole imaging workshop

Theory and Applications
• Combining density-neutron for effective porosity, total porosity and lithology evaluations.
• Geochemical Logging: Elemental Capture Spectroscopy and its applications for complex lithology evaluations.
• LWD: Advances in LWD data acquisition.
• NMR: Theory and applications for pore geometry mapping and for permeability evaluations
• Acoustic Measurements: Rock mechanical properties and wellbore stability applications. Acoustic scanner for anisotropy evaluation.
• Workshop on density-neutron-acoustic applications
• Resistivity log measurement: Rxo and true resistivity (Rt)
• Wireline Formation Testing: fluid pressure gradients
• Quicklook techniques to estimate water saturation, oil/water contact and unmoved hydrocarbon

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COURSE OFFERINGS

**Immersive Learning Programs**

- Overview of water saturation (Sw) evaluations in shaly sands.

**Practical sessions**

- Tool calibrations in the workshop
- Nuclear source safety
- Weak point and the cable head
- Depth control tool and devices
- Run Platform Express* integrated wireline logging tool: Logging run of Resistivity-Density-Neutron-gamma ray (GR) toolstring
- Running Acoustic logs: Logging run of Sonic toolstring (including cement bond log (CBL))
- Running Borehole Imaging logs: Logging run of Borehole Imaging toolstring
- Running Nuclear Magnetic Resonance logs: Logging run of a Magnetic Resonance toolstring
- Run Geochemical Logging: Logging run of a GR spectroscopy toolstring

**AUDIENCE**

Log analysts, petrophysicist, geologists, and wellsite geologists needing to become better acquainted with the practical aspects of wireline logging data acquisition and interpretation.

**PREREQUISITE**

Basic understanding of geology and formation evaluation.

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**Foundation – 5 Days**

**Cased Hole Logging and Formation Evaluation**

Attendees will learn to use cased hole logs for formation and production evaluation, including the underlying science of cased hole logs, the types of logging tools available, and optimal situations for their use. Instruction covers how to ensure the quality of logs for analysis and detect production problems.

**COURSE CONTENT**

- Reservoir and flow in wells
- Saturation monitoring with pulsed neutron capture and carbon/oxygen logging
- Single-phase flow in wells using basic flowmeter logs
- Cased hole logging to analyze multiphase flow
- Production logging techniques in horizontal wells
- Reservoir problem analysis
- Basic survey planning to maximize useful information
- Perforation techniques, including the choice of methods

**AUDIENCE**

Petrophysicists, geoscientists, or engineers who interpret cased hole logs or use cased hole log interpretation.

**PREREQUISITE**

A 2-year technical degree and an understanding of well operations.

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**Foundation – 5 Days**

**Tool Physics: Standard Logging Tools**

This course covers the basic logging tools: (1) The GR log physics and GR spectroscopy and its applications for geological modeling, estimating shale volume (Vsh), and determining the clay type (e.g., illite, smectite, etc.); (2) The SP physics of the SP log, its applications for estimating Vsh and the salinity of the formation water; (3) nuclear physics of the logging tool overview of the physics of nuclear logging; (4) density and htoelectrical log physics and applications in measuring porosity and determining lithology; (5) neutron-log applications in determining porosity and the sigma applications to estimate ”n” at downhole conditions and the applications of the density-neutron log in determining porosity, lithology, shale volume, hydrocarbon trends, and shale distribution (dispersed or laminated); (6) resistivity tool physics of the shallow Rs, laterolog, and induction, and high-technology resistivity tools, which use forward modeling to provide five resistivity data curves at different depths of investigation; (7) wireline formation testing (WFT) tool physics and the theory and applications of WFT in determining mobililities, reservoir pressure, and fluid contacts in the reservoir. An overview will be presented on the high-technology tools that include: dielectric Tool and its applications to estimate “n” and “n” at downhole conditions, nuclear magnetic resonance imaging borehole gravity meter, borehole resistivity imaging, and borehole ultrasonic imaging.

**COURSE CONTENT**

- Basics of logging
- Resistivity logging - The Archie Equation
- Forward Modeling and Inversion
- GR log physics, GR spectroscopy, and applications
- SP physics applications.
- Density and photoelectric log physics and applications
- Neutron log applications
- Pulsed neutron log
- Density-neutron log applications
- Resistivity tool physics
- Wireline formation testing
- High-technology tools

**AUDIENCE**

Suitable for anyone new to the oil and gas industry.

**PREREQUISITE**

None

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**Foundation – 5 Days**

**Well Placement Fundamentals**

This course introduces the concept of geological well placement (geosteering) and provides knowledge of the processes and techniques that can be used to successfully place high-angle and horizontal wells using geological and petrophysical data in real-time during drilling. The main purpose of high-angle and horizontal wells is to maximize reservoir contact and enhance well productivity. To plan and construct such wells requires real-time collaboration between geologists, who need quality formation evaluation data; drillers, who require considerable input from the geologists; and petrophysicists, who interpret the formation evaluation data during the drilling process to optimize well placement. This process is generally facilitated by the well placement coordinator. Various technologies involved in directional drilling, measurement, and formation evaluation while drilling are reviewed. The three different methods used to geologically place horizontal wells are introduced and the applications are discussed.

**COURSE CONTENT**

- Introduction to geological well placement
- Review of reservoir geology
- Directional drilling
- Measurement while drilling
- Formation evaluation and logging while drilling
- Applications of LWD measurements in well placement
• Applying well placement methods
• Case studies illustrating the use of the three well placement methods

AUDIENCE
Multidisciplinary asset teams of operating companies comprised mainly of drilling engineers, reservoir engineers, and geoscientists who need to make decisions regarding the applicability and benefits of implementing a geological well placement process for drilling horizontal and high-angle wellbores.

PREREQUISITE
Geoscience or engineering degree.

**Practical Petrophysics with Techlog**

*Foundation – 5 Days*

This introductory course is designed as an introduction to petrophysics and petrophysical workflows, which are illustrated with the Techlog log analysis software.

** COURSE CONTENT **

• Characterization of rock and fluid properties of reservoirs and non-reservoirs
  – Lithology
  – Porosity
  – Water saturation
  – Permeability
• The Basics – depth measurement, units, abbreviations, cores and logs
• The Results – hydrocarbon pay, volumetrics, value of information
• Data Acquisition – drilling data, coring and core analysis, wire line and LWD, borehole environment, pressure and temperature gradients
• Controls on rock properties – clastics and carbonates, origin, depositional energy and environment
• Porosity - core and log measurements, overburden correction,
• Water saturation – log and core derived, capillary pressure, wettability, electrical measurements,
• Permeability – core and log derived measurements and relationships
• Data Quality
• Shale and clay identification and distribution
• Matrix characteristics
• Fluid characteristics
• Hydrocarbon correction
• Shale correction
• Evaluation of Lithology, porosity and water saturation
• Borehole image analysis – fractures and facies
• Permeability prediction
• Pressure measurements, fluid gradients and contacts
• Saturation height relations
• Electrofacies and facies analysis
• Rock typing and petrofacies
• Integration with seismic – depth conversion, fluid substitution
• Unconventional reservoirs – TOC, porosity, hydrocarbon content
• Rock fabric classification (Lucia) – vuggy and non-vuggy limestones and dolomite
• Petrophysical interpretation – variable m and n parameters

• Bulk volume water (BVW)
• Production Ratio Index (PRI)
• Microporosity
• Fractures
• Multi-scale models
• Petrophysical models
• Volumetrics and uncertainty

**AUDIENCE**
This course is designed primarily for geoscientists and reservoir engineers involved in subsurface reservoir characterization and who wish to know how to derive petrophysically robust models for reservoir evaluation and modeling. Attendees should include: Geologists, Geophysicists, Petrophysicists, Reservoir Engineers, Drilling Engineers, Seismic Interpreters.

**PREREQUISITE**
Previous knowledge of log analysis basics is required for the exercises, however the theoretical and practical knowledge imparted during the course makes this non-essential.

**Petrophysics for Drilling Engineers**

*Foundation – 5 Days*

This 5-day course covers the following major fields: (1) Basics of well logging, reservoir rock basics in the logging life of a well, tool conveyance, mud log, wellbore stability and filtrate diameter of invasion depth control log quality control, gamma ray, and spontaneous - potential including tool physics and applications to estimate clay volume, clay type, and formation water salinities. (2) Porosity and lithology using density and neutron tools; physics and applications. (3) Acoustic tool physics and applications for rock mechanics, wellbore stability, and secondary porosity In addition to the applications of acoustic tools for predicting high-pressure zones. (4) Resistivity tool measurements, including tool physics of shallow Rxo, laterolog, and induction and advanced technology resistivity tools. (5) Wireline formation testing tool physics and the theory and applications of these tools to determine mobilities, reservoir pressure and fluid contacts in the reservoir. (6) Measurement-while-drilling and logging-while-drilling data acquisition data acquisition of porosity, lithology, pulsed neutron sigma, and resistivities. (7) Formation pressure geosteering basics and seismic acoustic interpretation covering the evaluation of clay volume (Vsh, Vcl) evaluation, estimating the m and n parameters in the Archie Equation, quicklook techniques to estimate the oil/water, gas/water, and oil/gas contacts, salinity estimations of formation water and filtrate water, and unmoved hydrocarbon zones plus estimation of porosity, lithology, and water saturations in clean and in shaly sands.

** COURSE CONTENT **

• Reservoir rock and life of a well
• The mud log and its applications
• Basics of well logging
• Log quality control
• GR Spectroscopy and its application to determine clay type
• Resistivity measurements and the spontaneous potential applications to estimate water salinity and volume of shale
• Acoustic Log: secondary porosity, rock mechanical properties and wellbore stability
• The Neutron Log, neutron spectroscopy and sigma neutron capture cross-section
• Basics of resistivity and the Archie Equation
• Wireline formation testing
• Measurement while drilling and logging while drilling
• Estimating the “m” and “n” parameters in the Archie equation
• Quicklook techniques

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
COURSES

Coring, Core Processing and Wellsite Handling

Foundation – 3 Days

This 3-day course provides an overview—from A to Z—on the coring process, core techniques, and wellsight handling. Designing a core program, core systems, and coring methods will also be covered. Reservoir wettability and its importance will be discussed, along with typical wellsight handling techniques, core fluids, and core equipment. The course will end with attendees participating in an interactive workshop and presenting their results at the end of the day.

COURSE CONTENT

• Coring process
• Core equipment
• Designing a coring program
• Review of reservoir wettability and why it is important
• Review of coring fluids
• Review of typical wellsight handling techniques
• Interactive workshop
• Presentation of workshop results

AUDIENCE

Any technical person involved in coring or core analysis

PREREQUISITE

None

Introduction to Petrophysics

Foundation – 5 Days

In this course, attendees are introduced to petrophysical principles and techniques through hands-on physical experiments that illustrate the importance of basic reservoir properties: porosity, permeability, resistivity of oil and water, and capillary pressure. The course topics include petrophysical rock types in conventional and unconventional reservoirs, wireline logging, LWD, pore geometry, core, and coring processes. The attendees will discover how conventional reservoir properties differ from unconventional reservoirs.

COURSE CONTENT

• Porosity: bulk volume, grain volume, and pore volume
• Permeability
• Pore geometry fundamentals and impacts in sandstone, limestone, and dolomite
• Wireline logging and LWD
• Core and coring operations
• Reservoir principles and mechanics
• Unconventional reservoirs

AUDIENCE

Geoscientists, engineers, and technicians who provide petrophysical technical support in need of an introductory understanding of petrophysical principles.

PREREQUISITE

None

Basic Logging Methods and Formation Evaluation

Foundation – 5 Days

In this introduction to openhole data acquisition, interpretation concepts, and practices, attendees will learn the primary logging tools used, the physics of how the measurements are made, and best practices to determine porosity and water saturation. Topics include new high-technology tools and their application to conventional and unconventional environments, including NMR, LWD, wireline formation testing, and borehole imaging. The attendees will also learn how to interpret actual log data in exercises designed to strengthen your understanding and interpretation skills.

COURSE CONTENT

• Reservoir rock, sedimentary basins, rock properties, carbonates, clastics, shales, and diagenesis
• Logging overview
• SP and gamma ray
• Porosity tools: Density, neutron, and acoustic
• Resistivity basics, deep-reading tools, true resistivity, shallow-reading tools, and flushed-zone resistivity
• Computing shale volume
• Quicklook methods
• Computing water saturation in the presence of shale
• Carbonates and their challenges
• NMR

Introduction to Production Logging and Reservoir Monitoring

Foundation – 5 Days

Structured to provide the attendees with the fundamentals of production logging and fluid mechanics, this course covers a variety of problems encountered in developing a producing asset, both from a well and a field perspective. Attendees will learn the fundamentals of diagnosing these problems using production logging tools and techniques, as well as how to minimize future occurrences using proactive reservoir monitoring techniques.

Note: A 3-day abbreviated version of this course is available by request. Contact your regional NExT office for more information.

COURSE CONTENT

• Tool conveyance using tractors and coiled tubing
• Depth control in cased hole wells using gamma ray and casing collar locator
• Vertical, deviated, horizontal completions and multilateral wells
• Inflow performance and productivity index
• Fluid velocity measurements using spinners and fluid injections
• Production problem diagnosing using production logs
• Basic production logging tools
• Spinner tool calibrations
• Single-phase flow interpretation and productivity index
- Logging techniques for reservoir monitoring
- PNL in capture mode: determining water, oil, and gas saturations in cased wells
- Leak detection using applied temperature logging
- Workshop: single-phase flow and estimating water saturation

**AUDIENCE**
Entry-level professionals of all disciplines and nontechnical support staff responsible for interpreting production logs or using production log interpretations.

**PREREQUISITE**
None

### 3D Petrophysics for High Angle Well Evaluation

**Advanced – 3 Days**

This course introduces the log interpreters to the high angle and horizontal well formation evaluation methodology and workflows deployed in 3D Petrophysics module of Techlog. The workflows allow correcting the logs for geometry effects observed in these well profiles; hence, enabling more accurate formation evaluation. There are demos and practical sessions designed along with the technical and domain presentations.

**COURSE CONTENT**
- Why 3D Petrophysics?
- Logging tool responses in near vertical versus high angle and horizontal wells
- Typical high angle effects on logs
- 3DP High angle well evaluation workflow
- Wellbore centric grid

**AUDIENCE**
Petrophysicists, Geologists involved in drilling and evaluation of high angle and horizontal wells.

**PREREQUISITE**
Techlog Fundamentals or experience using Techlog, Basic Petrophysics

### Techlog for Unconventional Shales Evaluation

**Advanced – 3 Days**

In this course, you go through the complete petrophysical evaluation of a shale oil and a shale gas reservoir. The course covers the calculation of the organic matter content in the reservoir, the reservoir quantitative evaluation, and the computation of hydrocarbon volumes in place.

**COURSE CONTENT**
- Calculation of TOC, comparison of TOC from different sources
- Build a petrophysical interpretation model fit to shale reservoirs using Quanti. Elan
- Calculate hydrocarbon volume in place

**AUDIENCE**
Development and Exploration Geologists, Petrophysicists - both with prior experience of using Techlog software.

**PREREQUISITE**
Techlog Fundamentals and Techlog Quanti. Elan

### Techlog Processing and Interpretation of Quanta Geo Images

**Advanced – 4 Days**

Participants are trained to use the Techlog wellbore software platform to perform processing and interpretation of photorealistic Quanta Geo formation images. A simplified physics lecture gives students a foundation of understanding the Quanta Geo physics of measurement. Starting from raw Quanta Geo data, students are taught to apply tool-specific signal processing methods in Techlog to remove borehole and mud effects and produce images that are most representative of the formation. Students then learn to use and optimize standard Techlog Wellbore Imaging (Wbi) methods to optimally process and visualize Quanta Geo images for interpretation. Emphasis is placed on the recognition of artifacts, and the corrective actions to take to eliminate them.

**COURSE CONTENT**
- QG Physics & Processing Overview
  - Ex. 1--process QG with default parameters
- QG Electromagnetics Fundamentals
- QG Physics
- QG Calibration
- QG Z90 Modes
- QG Corrected Amplitude & Blending
  - Ex. 2--processing parameters investigation
  - Ex. 3--processing challenging datasets
- QG Image Artifacts Catalog
- Interactive Depth Correction
- New Automatic Depth Correction
  - Ex. 4--depth correction
- QG Utilities, Splicer, Drillmark Filter

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COURSE OFFERINGS

- Ex. 5 - mode splicing & remedial
- QG LOC & Deliverables
- Ex. 6 - Challenge Competition
- QG Virtual Core & Virtual Slab
- Ex. 6 - Challenge Cont’d
- Challenge Results Presentations
- QG Inversion Principles & Demo
- QG Advanced Applications
- TL Wbi interpretation Basics
- QG Structural Analysis
- QG Sandcount
- QG Facies Analysis
- Results upscaling & export
- Open Discussion & Conclusion

AUDIENCE
Geologists, Petrophysicists, and Geomechanics Specialists interpreting Quanta Geo images.

PREREQUISITE
Students should have at least basic familiarity with the Techlog user interface, data structure, workflow manager, and plots.

Techlog Processing and Interpretation of Quanta Geo Images with Techlog Fundamentals

Advanced – 5 Days

Participants are trained to use the Techlog wellbore software platform to perform processing and interpretation of photorealistic Quanta Geo formation images. A simplified physics lecture gives students a foundation of understanding the Quanta Geo physics of measurement. Starting from raw Quanta Geo data, students are taught to apply tool-specific signal processing methods in Techlog to remove borehole and mud effects and produce images that are most representative of the formation. Students then learn to use and optimize standard Techlog Wellbore Imaging (Wbi) methods to optimally process and visualize Quanta Geo images for interpretation.

COURSE CONTENT
- Opening Remarks, Participant introductions and HSE
- TL Fundamentals - Import/Export, Database
- TL Fundamentals - Techplot, Workflow Interface
- TL Fundamentals - Wbi basics
- QG Physics and Processing Overview
  - Ex. 1 - Process QG with default parameters
- QG Electromagnetics Fundamentals
- QG Physics
- QG Calibration
- QG Z90 Modes
- QG Corrected Amplitude and Blending
  - Ex. 2 - Processing parameters investigation
  - Ex. 2 cont’d - Processing parameters investigation
  - Ex. 3 - Processing challenging datasets
- QG Image Artifacts Catalog

- Interactive Depth Correction
- New Automatic Depth Correction
  - Ex. 4 - Depth correction
- QG Utilities, Splicer, Drillmark Filter
  - Ex. 5 - Mode splicing & remedial
- QG LOC & Deliverables
  - Ex. 6 - Challenge Competition
- QG Virtual Core & Virtual Slab
  - Ex. 6 - Challenge Cont’d
- Challenge Results Presentations
- QG Inversion Principles & Demo
- QG Advanced Applications
- TL Wbi interpretation Basics
- QG Structural Analysis
- QG Sandcount
- QG Facies Analysis
- Open Discussion & Conclusion

Techlog Reservoir Petrophysics

Skill – 3 Days

This 3-day course covers how to handle, prepare, and interpret core, pressure, and petrophysical data from a wellbore centric perspective. Participants will build integrated interpretation workflows to provide input to their static reservoir models. They will also import, QC, and interpret pressure versus time data obtained by wireline or LWD technology for proper gradient and free fluid levels analysis. The results of this interpretation will be used as an input for saturation height modeling. The course will also cover managing contacts within complex compartmentalized reservoirs in a single well and multwell context.

COURSE CONTENT
- Saturation Height Modelling, SHM,
- Formation Pressure Analysis, FPress

AUDIENCE
Development and exploration petroleum engineers, reservoir engineers, log analysts, and petrophysicists

PREREQUISITE
Techlog software platform knowledge

Techlog for Geologists

Advanced – 5 Days

In this course, attendees learn advanced interpretation and processing capabilities with a focus on the management of wellbore image data and the performance of interpretation workflows for analysis of these data. Topics include facies typing using neural network methods, multivellot plotting, cross section building, and mapping in the Techlog platform application. Learn to use Techlog platform geologic tools to achieve efficient data integration.

PREREQUISITE
Techlog software platform knowledge

Next | 101
COURSE CONTENT

- Load, process, and manipulate image data and core photos
- Pick dips and facies
- Interpret dips and facies
- Neural network techniques for facies prediction
- Use zone editing for field maps, kriging, and multiwell cross sections

AUDIENCE
Development and exploration geologists with prior experience using Techlog platform software.

PREREQUISITE
Techlog Fundamentals course.

**Techlog Borehole Image Interpretation**

**Advanced – 3 Days**

In this course, attendees learn advanced interpretation and processing capabilities for the management of wellbore image data and the performance of interpretation workflows for data analysis. The attendees will gain a full range of skills to manipulate, process, and use all types of borehole image data within the Techlog platform suite.

**COURSE CONTENT**

- Load, process, and manipulate image data and core photos
- Pick dips and facies
- Interpret dips and facies

**AUDIENCE**
Development and exploration geologists and petrophysicists involved in wellbore image data processing and interpretation who have prior experience using Techlog platform software.

**PREREQUISITE**
Techlog Fundamentals course.

**Techlog Formation Evaluation with Quanti.Elán**

**Skill – 2 Days**

This course introduces attendees who are experienced log interpreters to building log interpretation models and generating solutions with the Quanti.Elán module of the Techlog platform.

**COURSE CONTENT**

- Load and quality control data (from DLIS or LAS files)
- Precomputation of critical parameters for interpretations, including mineral, rock, and fluid endpoints
- Log response equations with emphasis on neutron porosity and resistivity-based saturation equations
- Initialization and construction of formation evaluation models
- Zoning and classification groups
- Combining formation evaluation models
- Postprocessing
- Customization with python module

**AUDIENCE**
Development and exploration geologists, petrophysicists, and reservoir engineers with prior experience using Techlog software.

**PREREQUISITE**
Techlog Fundamentals course and formation evaluation experience using Techlog software.

**Techlog Saturation Height Modelling**

**Skill – 2 Days**

In this course, you will learn how to handle, prepare and interpret core and petrophysical data from a wellbore centric perspective. You will learn how to build integrated interpretation workflows to provide input to your static reservoir model. The workflow is completed by exporting the refined model for static reservoir modelling.

**COURSE CONTENT**

- Capillary pressure data handling (Data import, QC and processing)
- Generating a capillary pressure model using petrophysical properties for different rock types in a multi pore throat environment
- Optimizing the capillary pressure model in log domain
- Solving for free water level, FWL per hydraulic zone in a multiwell environment

**AUDIENCE**
Reservoir Engineers, Petrophysicists

**PREREQUISITE**
Basic Petrophysics, Techlog Fundamentals

**Petrel Advanced Wells**

**Skill – 2 Days**

This course builds on the Petrel Reservoir Engineering course and goes more into depth on modeling of deviated wells. The standard well modeling with the ECLIPSE simulator package and the FrontSim module treats the entire wellbore as a single entity; therefore, the model cannot take into account pressure changes along the wellbore due to friction, valves, or pumps. Such devices are often used with horizontal wells to control the inflow profile along the well trace.

To model these effects, a multisegmented well model must be used. This course explains the capabilities of this well model and how to use the Petrel platform to set up the model. Methods for adding completions such as valves and pumps and making development strategies using the equipment are also covered in this course.

Sector models can be useful to study portions of a reservoir. This course shows how to define sectors, select boundary conditions, and run sector models.

**COURSE CONTENT**

- Standard well model vs. the multisegmented well model
- Pressure drop along horizontal wells
- Designing horizontal wells and wells with laterals
- Setting up multisegmented wells
- Completion design for multisegmented wells
- Development strategies with group control
- Sector models

**AUDIENCE**
Reservoir engineers or geoscientists with above average experience in the domain.

**PREREQUISITE**
Petrel Fundamentals and Petrel Reservoir Engineering or equivalent experience.

**Techlog Formation Evaluation**

**Advanced – 5 Days**

Attendees will explore the use of the Techlog platform base modules: Techplot,
Techdata, Quanti, and Quanti.min. In this class, attendees will acquire a solid foundation in the data model within the Techlog platform application and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images. Deterministic calculations and the principles behind the application workflow interface for single- and multiwell use are covered in this course in addition to studying multiple log and secondary inversion techniques, thin-bed analysis, and integration of different types of data to enhance the interpretation process. Attendees will also learn how to perform day-to-day tasks within the Techlog platform suite and learn advanced techniques for improving the analysis results.

**COURSE CONTENT**
- Techlog interface and data structure
- Data management and QC
- Multiwell management
- Basic plotting tools
- Workflows for deterministic evaluation using Quanti modules
- User-defined programming language
- Thin-bed analysis techniques
- Multiple-component inversion

**AUDIENCE**
Development and exploration log analysts and petrophysicists with limited or no experience using Techlog platform software.

**PREREQUISITE**
Techlog Fundamentals course.

### Petrel Property Modeling

**Skill – 3 Days**

This course focuses on the fundamentals of modeling using the Petrel platform. The course covers basic geostatistics, data preparation, data analysis, facies, and petrophysical modeling. Attendees will learn different ways to create property models and how to condition models to existing models and secondary data. This course guides the user through concepts, algorithms, and software functionalities in property modeling.

The first portion of the course focuses on the use of basic geostatistical tools through data analysis. Also, premodeling processes concerned with well data preparation will be covered, the first step of which is the property modeling workflow followed by upsampling well logs to create single-property values at the well location for each cell. This technique creates hard data that will be used to populate the 3D grid with either deterministic or stochastic algorithms. The second half of the course focuses on facies and petrophysical modeling workflows using stochastic methods as well as covering the usage of kriging for continuous properties. Implementing data analysis results and using secondary data to constrain the result will also be shown.

**COURSE CONTENT**
- Basics of uni- and bivariate geostatistics
- Data preparation, including well log edits, calculations, and upsampling for discrete and continuous data
- Facies modeling
  - Data analysis
  - Sequential indicator simulation
  - Object facies modeling
  - Truncated Gaussian simulation with and without trends
  - Using secondary data to populate facies models
- Petrophysical modeling
  - Data analysis

- Sequential Gaussian simulation
- Gaussian random function simulation
- Kriging
- Using secondary data to populate petrophysical models

**AUDIENCE**
Development and exploration geologists, geophysicists, geochemists, petrophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in using Petrel platform software.

**PREREQUISITE**
General knowledge of petroleum geology and attendance of the Petrel Fundamentals course or equivalent experience.

### Techlog Acoustics Processing and Interpretation

**Skill – 5 Days**

This course teaches the theory, processing and interpretation of sonic waveforms using Techlog platform. Participants will learn how to QC raw data such as waveforms, and slowness projections. Participant will also learn how to perform field data slownesses relabeling and process acoustic data for formation slownesses and anisotropy. Also, dispersion analysis tools will be explained in detail to allow users to define the most appropriate parameters for their processing. Furthermore, Slowness processing based on Slowness Time Coherence (STC) technique is covered in detail. Acoustic anisotropy using cross-dipole data is covered from the theory, acquisition, to the final processing of acoustic anisotropy results.

**COURSE CONTENT**
- Borehole acoustics and tool theory
- Acoustics data type in Techlog
- Data import and preparation
- Visualization and QC of Waveforms
- Relabeling on field processed data
- Slowness processing theory and workflows
- Dispersion analysis and its application
- Acoustic anisotropy theory and workflows
- Anisotropy processing using four-component rotation module
- Porosity and Elastic properties calculation from Slownesses
- Application of Sonic data to Petrophysics, Geophysics, Geomechanics etc.

**AUDIENCE**
Petrophysicists, Geophysists, Geomechanics engineers, Log analysts and any user working with borehole acoustic data such as formation slownesses.

**PREREQUISITE**
Techlog Fundamentals.

### Techlog Formation Pressure Analysis

**Skill – 2 Days**

In this course, you will learn how to handle, prepare and interpret pressure vs. time and pressure vs. depth data from a wellbore centric perspective. You will learn how to build integrated interpretation workflows to find gradients and free fluid levels to be used as input into Saturation Height Modelling. You will import pressure data, quality check the pressure data and perform advanced processing on pressure vs. time (Flow Regime Identification) and on pressure vs. depth (Gradient Analysis and Excess Pressure). You will work on an integrated single well workflow from pressure vs. time to pressure vs. depth. Then on a multiple wells workflow on pressure vs. depth to do pressure calibration and free level determination.
COURSE CONTENT
• Formation testing tool data handling (Data Import, QC and Processing)
• QC of pressure vs. time data to generate a pressure vs. depth dataset
• QC of gradients and determination of free water levels from pressure vs. depth dataset
• Single well integrated workflow from pressure vs. time to pressure vs. depth
• Multi well workflow with pressure vs. depth

AUDIENCE
Reservoir Engineers, Petrophysicists, Operation Geologists

PREREQUISITE
Techlog Fundamentals, Basic Petrophysics

Techlog for Pipe and Well Integrity Evaluation

Skill – 2 Days

This course will teach you how to use Techlog* to evaluate Pipe integrity and Cement hydraulic isolation with wireline logging measurements. You will become familiar with the principles of operation of the logging tools and the methods available in Techlog to create an interpretation report.

COURSE CONTENT
• Introduction to cement evaluation; tools principles and interpretation
• Manual cement evaluation
• Automatic cement evaluation of Bond amplitude and Acoustic impedance
• Introduction to Pipe evaluation
• Pipe evaluation with Radius and Thickness input

AUDIENCE
Petrophysists, Drilling engineers, Borehole production engineers

PREREQUISITE
Techlog knowledge

Techlog Cased Hole formation evaluation

Skill – 1 Days

The purpose of this course is to introduce attendees to the fundamentals of cased hole formation evaluation. The course is focused on the Pulse Neutron tool theory and the interpretation of Sigma and Carbon Oxygen Ratio measurements. You will become familiar with the available methods to build a comprehensive workflow.

COURSE CONTENT
• Pulse Neutron tool theory
• Sigma processing and interpretation
• Carbon Oxygen Ratio processing and interpretation

AUDIENCE
Petrophysists

PREREQUISITE
Techlog working knowledge

Petrel Well Correlation

Foundation – 3 Days

The Petrel platform offers various options for well correlation. This course provides attendees with a general overview of correlation and introduces well data import procedures with different formats and the use of the Reference Project tool. This course focuses on setting well section templates, the value of sharing templates between projects, wells, and well section windows, in addition to interpreting and editing stratigraphic and fault well tops (markers) along well paths based on log readings. Attendees will learn advanced discrete and continuous log interpreting and editing options based on existing logs, and apply the different techniques in a typical working order, from simple exploration wells to production phase.

COURSE CONTENT
• Project organization, including Studio Favorites, Studio Find, and Studio Annotate E&P knowledge environment features
• Import procedures for wells and logs, including the Reference Project tool
• Working and setting well section and templates
• Seismic and 3D model backdrop
• Continuous and discrete log interpretation (manual, calculator, and neural nets) and log edits

programming skills, Python and Techlog platform modules (libraries), and advance scripting including reading and writing and creating Techlog platform modules.

Interview with Python Scripting

Skill – 2 Days

This course is designed to introduce attendees to programming basic and advanced scripts in the Techlog platform. The attendees will learn how to create, edit, open, and run scripts in a Techlog workflow. Topics include Python syntax and
IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

COURSE CONTENT

**Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics**

**Skill – 5 Days**

This course starts by teaching the fundamentals of acoustic waveform propagation in a borehole and how the waveforms recorded by an array sonic tool can be processed and interpreted to obtain valuable quantitative information about the petrophysical and mechanical properties of the rocks. It contains an overview of petrophysical and mechanical properties of the rocks and explains the different constraints and limitations of each measurement (monopole, dipole, quadrupole). The course contains several practical exercises using Techlog in which the participants will be able to load real sonic data from Wireline and LWD sonic tools and QC the quality of the raw waveforms, as well as the main products such as slowness projections and slownesses.

**AUDIENCE**

Basic understanding of geoscience and petroleum engineering

**PREREQUISITE**

None

**COURSE OFFERINGS**

SOFTWARE

**Awareness** – 5 Days

The Techlog platform interactive suite brings all of the petrophysical and geological data together. Attendees will learn the fundamentals of this application and its Techplot, Techdata, and Quanti base modules. In addition, the use of the data model within the Techlog application and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images will be explained. The course topics include deterministic calculations and the principles behind the application workflow interface for single- and multiwell use.

**COURSE CONTENT**

- Techlog interface and data structure
- Data management and QC techniques
- Multiwell management
- Basic plotting tools
- Workflows for deterministic evaluation using Quanti module
- User-defined programming language
- Advanced Techlog platform modules

**AUDIENCE**

Development and exploration log analysts and petrophysicists, geologists, petroleum engineers, managers, and technical personnel with no prior experience using Techlog software.

**PREREQUISITE**

None

**Capillary Pressure and Saturation Height Model Concepts For Reservoir Petrophysics**

**Foundation – 3 Days**

This course enables participants to understand the fundamental concepts of capillary pressure from lab to saturation height model analysis. A practical
approach is used to discuss lab measurement options, standard corrections, determining fluid contacts and the free water level. Participants, complete a capillary pressure analysis and saturation height model based on petrophysical rock types. The final results are integrated with flow and storage characteristics. The concept workshops are completed using Excel, so the process is transparent to the users.

**COURSE CONTENT**

- Course Introduction
- The concept of capillary pressure
- Introduction to pore throat concepts
- Excel workshop 1 (Pore Throat Size and Data Summary)
- Sandstone case study
- Overview of lab methods (Focus on mercury injection capillary pressure)
- Excel workshop 2 (Semi-Log, Intrusion Plots and Data Quality Checks)
- Conversion from Lab to Height Above Free Water
- Excel Workshop 3 (Convert Lab to Height)
- Define Facies and Petrophysical Rock Types
- Carbonate Case Study
- Excel Workshop 4 (Petrophysical Rock Types Pc Groups and Curve Fitting)
- The concepts of Saturation Height Models
- Excel Workshop 5 (SHM-Manually and SHM-Automated)
- Case Study
- Introduction to Pc and SHM Options in TechLog
- Course Wrap Up

**AUDIENCE**

Any subsurface professional that is using capillary pressure data in PETREL or TechLog.

**PREREQUISITE**

Participants need a basic knowledge of petroleum geology, log based water saturation techniques and a basic understanding reservoir characterization data requirements.

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**Production Logging**

- The various high technology tools that are used to estimate the 3-fluid phase velocities
- The various high technology tools that are used to estimate the 3-vertical/deviated/horizontal wells. hold-ups.
- Production logging in vertical/deviated/horizontal wells.
- Reservoir Monitoring
- Pulsed Neutron Logging (PNL): The physics and applications of PNL to estimate water saturation and gas saturation behind casings.
- PNL applications for gravel pack quality control and for log-inject-log applications.
- Cased Hole resistivity measurement behind conductive casings to obtain formation resistivity measurements.

**AUDIENCE**

This class is open to all technical domains in the oil and gas industry. No prior cased hole experience is necessary. However, the course will also be beneficial to engineers with cased hole experience as it covers modern high technology tools' physics and operations.

**PREREQUISITE**

None

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**Introduction to Cased-Hole Data Acquisition and Interpretation (Virtual instructor)**

**Foundation – 3 Days**

This is a 3-day course which is an introduction to cased hole data acquisition and interpretations. The course covers three main cased hole topics: Well integrity: This covers corrosion mechanism and corrosion monitoring, leak detection and cement evaluation. Production logging: This covers production logging in vertical, deviated and horizontal wells and also covers modern technology data acquisition tools to obtain holdups and velocities of the three phases: Water/oil/gas. Reservoir monitoring: This covers estimations of water and gas saturations behind conductive and non-conductive casings. This includes Pulsed Neutron (PNL) logging and resistivity logging behind conductive and non-conductive casings.

**COURSE CONTENT**

- Well Integrity
- Leak Detection using temperature and noise log profiling and oxygen activation to detect water movements inside and behind single and multiple casings.
- Corrosion Mechanism and Corrosion Monitoring. This covers new high technology corrosion monitoring tools and cathodic protection (CP) applications
- Cement Evaluation: New cement evaluations tools that give detailed circumferential coverage of cementing around the inner casing.
Geomechanics

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

### Geomechanics

<table>
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<tr>
<th>DOMAIN</th>
<th>SOFTWARE</th>
<th>INTEGRATED/BLENDED</th>
<th>COMPETENCY LEVEL</th>
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<tbody>
<tr>
<td>Reservoir</td>
<td>Drilling</td>
<td>Unconventional Reservoir</td>
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<td>Advanced Petroleum Geomechanics</td>
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<td></td>
<td>Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements</td>
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<td>ADVANCED</td>
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<td>Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics</td>
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<td>Reservoir Geomechanics with Petrel</td>
<td>Deepwater Geohazards</td>
<td>Practical Aspects of Shale Gas Geomechanics</td>
<td>SKILL</td>
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<td>Pore Pressure Prediction Methods using Techlog</td>
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<td>Geomechanics Applications in Heavy Oil</td>
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*Technical courses that use software, includes practical sessions, field trips, uses simulation*
### Geomechanics

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<td><strong>Techlog</strong></td>
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<td>Techlog Pore Pressure Prediction and Wellbore Stability</td>
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<td><strong>SKILL</strong></td>
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### Geomechanics

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Advanced Petroleum Geomechanics

Advanced – 5 Days

This course builds on the NExT Fundamentals of Petroleum Geomechanics course and starts to investigate geomechanics beyond simple elastic, isotropic behavior. After a brief review of fundamental concepts, the course looks at the impact of reversible and nonreversible geomechanical behavior on drilling, stimulation, sand production, and injection, looking specifically at thermal, depletion, and compaction effects. The course then investigates anisotropy, its nature and effect on geomechanics and its significance and influence on well construction and field development. The course also covers the mechanics of salt, its short- and long-term behavior. Participants will understand the effect of salt on the local stress state and what needs to be considered when developing fields either created by or accessed through salt.

COURSE CONTENT

• The business of petroleum geomechanics
• Review of fundamentals
• Mechanical earth model
• Anisotropy fundamentals
• Mechanical properties
• Wellbore applications
• Effects on stress
• Laboratory measurements
• Reservoir geomechanics
• Compaction
• Thermal
• Depletion effects
• Well integrity
• Plasticity
• Salt mechanics
• Stress
• Wellbore stability
• Drilling topics: bits, fluids, lost circulation, wellbore strengthening
• Sonic logging and other measurements for geomechanics
• Fractures, faults, and earthquakes
• Summary and wrap-up

AUDIENCE

Geologists, geophysicists, geomechanics engineers, drilling engineers, production engineers, completion engineers, reservoir engineers, exploration supervisors, and managers concerned with the geomechanics challenges of field development

PREREQUISITE

Completion of Fundamentals of Petroleum Geomechanics or strong understanding of geomechanics fundamentals

Rock Physics: Integrating Petrophysical, Geomechanical, and Seismic Measurements

Skill – 5 Days

This 5-day course is designed to increase attendees' understanding of the sensitivity of elastic waves in the earth to mineralogy, porosity, pore shapes, pore fluids, pore pressures, stresses, and the anisotropy of the rock fabric resulting from the depositional and stress history of the rock and how to use this understanding in quantitative interpretation of seismic data and in the construction of mechanical earth models. A variety of applications and real data examples is presented.
Shales and unconventional reservoirs
Anisotropy of shales
Rock physics modeling of kerogen in organic-rich shales
Effect of anisotropy on AVD
Microseismic and effect of azimuthal anisotropy on propagation of hydraulic fractures

AUDIENCE
Geoscientists, petrophysicists, and engineers with a need to understand rock physics and learn how to work together in integrated teams to build geomechanical models.

PREREQUISITE
Basic knowledge of geology, geophysics, and petrophysics.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Skill – 5 Days

This course starts by teaching the fundamentals of acoustic waveform propagation in a borehole and how the waveforms recorded by an array sonic tool can be processed and interpreted to obtain valuable quantitative information about the petrophysical and mechanical properties of the rocks. It contains an overview of sonic acquisition technologies (both Wireline and LWD) and explains the different constraints and limitations of each measurement (monopole, dipole, quadrupole). Finally, an overview of the different applications of sonic data for geomechanical applications, petrophysics, and geophysics is provided.

COURSE CONTENT
- Overview acoustic logging and its applications in the oil & gas industry
- Fundamentals of borehole acoustics and wave propagation theory
- Understand sonic tool hardware with examples from different Wireline and LWD tools
- Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc.)
- Import DLIS data containing sonic waveforms and use Techlog to assign tool-specific properties
- Theory of semblance processing and slowness estimation from array waveform data
- Non-dispersive slowness time coherence (STC) processing workflow
- The importance of dispersion analysis for identifying best processing parameters
- Dispersive STC (DSTC) for dipole data
- Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
- High-resolution (multiple shot) processing
- Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
- Quadrupole shear and its applications
- Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
- Processing slownesses in challenging environment: Leaky-P processing
- Quality control of slownesses using dispersion analysis tool and slowness frequency analysis (SFA) projections
- Case study for an exploration well: run the full P&S workflow, derive the best slownesses combining monopole and dipole results.
- The concept of anisotropy in the earth and how it is measured
- The different mechanisms of acoustic anisotropy and their applications in the oil & gas industry

Reservoir Geomechanics with Petrel

Skill – 5 Days

This course covers the necessary fundamentals of reservoir geomechanics in a 3D environment; the origin of stresses in the subsurface and how in situ stresses could be understood using wellbore data, seismic and geological interpretations. Using the Finite Element Method, computed stresses and deformations could be calibrated against measurements, but moreover, changes in the in-situ stress state could be computed due to changes in reservoir pressures along with their impact on reservoir performance; mechanical properties such as rock strength, deformability and pore collapse, how they can be measured in the laboratory and translated into numerical modeling. The course blends theoretical lectures with hands-on software training on the PetrelRG suite of software.

COURSE CONTENT
- Fundamentals of reservoir geomechanics
- Value of full-field geomechanics in the petroleum industry
- Review of geomechanics concepts and how these are applied in the petroleum industry; understand the concepts of stress, strain, effective stress, principal stresses, elasticity, plasticity and failure
- Geomechanics property modeling; use of wireline derived rock mechanical properties together with seismic attributes and geostatistical methods for 3D property modeling
- Experimental rock mechanics for reservoir geomechanics studies; Review of standard rock mechanics testing and introduction to laboratory measurements specific to reservoir geomechanics applications; understanding of test results and ability to analyze and evaluate laboratory reports
- Reservoir geomechanics processes and introduction to PetrelRG
- Understand the mechanics of depletion, stress transfer between reservoir and surrounding formations, theory and compaction and subsidence, importance of stress path, thermal effect, impact of faults and fractures; Understand the importance and stress initialization to model in-situ stress state
- Introduction to reservoir Geomechanics modeling with PetrelRG
- Building reservoir geomechanics grids, design geomechanics materials and perform property modeling and property population

Visit NExTTraining.com/classes for the latest calendar or to register for a course.
• Geomechanical property modeling and stress initialization with PetrelRG
• Case study: geomechanics property modeling using seismic inversion as input
• Discontinuities (faults and fractures) in reservoir geomechanics models
• Apply initial pressure, temperature and saturation to reservoir geomechanics models, define boundary conditions and perform stress initialization
• Coupled reservoir Geomechanics simulation with PetrelRG
• Case study: practical aspects of in-situ stress calibration
• Define and submit simulation cases with coupled reservoir simulator
• Perform 1-way and 2-way coupled simulations
• Basic ECLIPSE knowledge important for coupled reservoir geomechanics modeling and introduction to history matching assisted by 2-way reservoir geomechanics modeling
• Reservoir geomechanics model results analysis with PetrelRG
• Results analysis; import coupled simulator results to PetrelRG; stress charting and results QC
• Application of reservoir geomechanics to reservoir management; utilization of reservoir geomechanics models to examine cap-rock integrity and casing deformation in depleting reservoirs
• Post-processing case studies – application of reservoir geomechanics model results to common reservoir management tasks; 3D wellbore stability planning, hydraulic fracture design, geomechanics-driven permeability updating

**AUDIENCE**
Geomechanicists, geologists, geophysicists, production engineers, completion engineers, reservoir engineers, and asset managers concerned with reservoir management, gas and / or water injection, EOR, HPHT field management and long-term reservoir forecasting.

**PREREQUISITE**
None

### Deepwater Geohazards

**Skill – 5 Days**

Obtain a good understanding of the geological, geophysical and geomechanical aspects of geohazards, their prediction and mitigation. There will be extra focus on fundamentals of geomechanics and pore pressure modeling. Please note that this is not a drilling deep water course but it complements such course. The course is most suited for geoscientists, petroleum engineers and drilling engineers who want to know more about geological and geophysical aspects of geohazard.

**COURSE CONTENT**
- Introduction and overview of Geohazard?
- Key Geohazard Mechanisms
- Understanding and their predictions
- Introduction to Geomechanic and Mechanic Earth Modeling
- Fundamental of geomechanic and its applications in drilling,
- Pore Pressure and its prediction
- Basic of pore pressure and over pressure mechanisms
- Pore pressure prediction methods (pre-drill, while drilling and post drill)
- Drilling Deep Water Challenges Related to Geohazards?
- Identification of geohazard related to drilling A-Z (from platform installation to drilling, completion and production)
- Geohazard Management Planning Process – Putting it all together

### Practical Aspects of Shale Gas Geomechanics

**Skill – 4 Days**

Geomechanics plays a critical role in successfully optimizing unconventional reservoir exploitation. This course can help understand the essential aspects of geomechanics in unconventional resource plays enabling an engineer or geoscientist to make better field development decisions. A unique feature of this course is that it provides a unified geomechanics approach combining theoretical, laboratory (core testing) and field aspects.

**COURSE CONTENT**
- Introduction to shale gas geomechanics – business drivers …
- Basics of Rock Mechanics includes - concept of stress/strain; definition of elastic properties, Young’s modulus, Poisson’s ratio, bulk modulus, shear modulus, bulk compressibility; rock strength – UCS, tensile strength and shear strength; yield, failure and failure criteria.
- Understanding Earth Stresses includes - concept of principal stresses; are principal stresses always vertical and horizontal?; in-situ stresses - overburden stress, minimum and maximum horizontal stresses: magnitude and orientation; stress regimes – is vertical stress always the maximum?; pore pressure and principle of effective stress; estimating stresses from wire line logs; calibration of in-situ stresses; borehole breakouts, drilling-induced tensile fractures, use of image logs in understanding stress orientation and anisotropy; how does stress help orient wellbore and completions; stress measurement using mini-frac/LOT/MDT; basic definitions of fracture gradient, break down pressure, fracture propagation pressure, closure pressure and other terminologies used in LOT/MDT.
- Shale Anisotropy and Heterogeneity includes - characterizing shale from geomechanics perspective; shale anisotropy – micro-scopic to core to field scale; how to evaluate it?; evaluating TIV anisotropy, scratch testing and variation in mechanical properties in vertical and horizontal directions;
- Anisotropy and Stress in Shales – anisotropic stress models, acoustic anisotropy; estimating anisotropic parameters using acoustic azimuthal anisotropy (Sonicscaner).
- Drilling through Shale includes - effect of intrinsic anisotropy, bedding planes and natural fractures; transversely isotropic and anisotropic models in wellbore stability analysis; geomechanical considerations for drilling high angle and horizontal wells through laminated shale.
- Hydraulic fracturing and Shale stimulation - theory of hydraulic fracturing, how fractures are created/initiated, fracture growth; fracture height and width, preferential direction, vertical and horizontal fracs, and frac barriers; parameters controlling frac geometry; fractured reservoirs: influence of natural fractures on fracturing; frac fluid and proppant properties.
- Introduction to Microseismics - hydraulic fracture performance evaluation; introduction to microseismic and hydraulic fracturing monitoring (HFM); field examples on hydraulic fracturing and horizontal completions in shale gas reservoirs.
- Interaction between natural and induced fractures – the effect of natural fractured formations on hydraulic fracturing
- Hydraulic fracture propagation in a naturally fractured formation

**AUDIENCE**
This short course is intended for engineers, geoscientists, and technologists

**Deepwater Geohazards**

**Skill – 5 Days**

Obtain a good understanding of the geological, geophysical and geomechanical aspects of geohazards, their prediction and mitigation. There will be extra focus on fundamentals of geomechanic and pore pressure modeling. Please note that this is not a drilling deep water course but it complements such course. The course is most suited for geoscientists, petroleum engineers and drilling engineers who want to know more about geological and geophysical aspects of geohazard.

**COURSE CONTENT**
- Introduction and overview of Geohazard?
- Key Geohazard Mechanisms
- Understanding and their predictions
- Introduction to Geomechanic and Mechanic Earth Modeling
- Fundamental of geomechanic and its applications in drilling,
- Pore Pressure and its prediction
- Basic of pore pressure and over pressure mechanisms
- Pore pressure prediction methods (pre-drill, while drilling and post drill)
- Drilling Deep Water Challenges Related to Geohazards?
- Identification of geohazard related to drilling A-Z (from platform installation to drilling, completion and production)
- Geohazard Management Planning Process – Putting it all together

**COURSE OFFERINGS**

**Deepwater Geohazards**

**Skill – 5 Days**

Obtain a good understanding of the geological, geophysical and geomechanical aspects of geohazards, their prediction and mitigation. There will be extra focus on fundamentals of geomechanic and pore pressure modeling. Please note that this is not a drilling deep water course but it complements such course. The course is most suited for geoscientists, petroleum engineers and drilling engineers who want to know more about geological and geophysical aspects of geohazard.

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- Drilling Deep Water Challenges Related to Geohazards?
- Identification of geohazard related to drilling A-Z (from platform installation to drilling, completion and production)
- Geohazard Management Planning Process – Putting it all together
involved in exploration, drilling, completions and production in unconventional reservoirs.

PREREQUISITE
4 years of Geoscience or engineering degree.

Pore Pressure Prediction Methods using Techlog
Skill – 5 Days

This course will cover the fundamental principles of pore pressure modeling and application to oil field problems. The basic concepts used in pore pressure prediction will be presented, and methods for estimating pore pressure using log and seismic data will be explained and discussed. The discussion will focus on deriving a calibrated pore pressure model from seismic velocities. This implies calibration with offset well data in order to derive a calibrated velocity-to-pore pressure transform. The different data types used for optimal model calibration will be presented. The rock physics basis underlying such transforms is discussed, and their application to pore pressure modelling is illustrated using several examples from the Gulf of Mexico.

COURSE CONTENT
- Techlog exercises

AUDIENCE
Exploration and development geologists, petrophysicists, geophysicists, drilling engineers, completion engineers and reservoir engineers who need an essential understanding of the impact of pore pressure on drilling, wellbore stability, and reservoir management.

PREREQUISITE
Basic understanding of drilling, geology and geophysics. Basic understanding of risks associated with drilling operations.

Mangrove Express Hydraulic Fracture Design
Skill – 3 Days

Mangrove Express fracture design in the Petrel platform is an efficient and powerful software that optimizes reservoir-centric completions using multiple options for fracture simulators, best-in-class visual interpretation tools and robust sensitivity analysis capabilities. Mangrove Express design provides numerous options for fracture models including the Planar3D simulator. The formulation of Mangrove Express design fracture models are based on extensive laboratory and field experiments and are continuously improved as advancements are made in the industry.

COURSE CONTENT
- Petrel Introduction for Mangrove users. Various introductory information on the use of Petrel and what is needed to run Mangrove.
- Well Setup
- Defining Zones
- Defining Completions and use of Completion Advisor
- Fluids and Proppants definitions
- Defining treatment path
- Defining Stimulation cases

AUDIENCE
This course is designed to introduce Completion Engineers, Reservoir Engineers, Geoscientist, Stimulation Engineers and Asset teams to the Mangrove Express Software.

PREREQUISITE
Completion Engineering, Petroleum Engineering, Geomechanics and Geology

Geomechanics Applications in Coalbed Methane
Skill – 2 Days

Geomechanics plays a critical role in optimizing unconventional reservoir exploitation. This 2-day course provides essential aspects of geomechanics in coalbed methane (CBM), enabling an engineer or geoscientist to make better field development and operational decisions. A unique feature of this course is that it gives a unified geomechanics approach combining theoretical, laboratory (core testing), and field aspects to effective exploitation of unconventional reservoirs. This course covers the necessary fundamentals of geomechanics as applied to coal, cleats, and natural fractures and their influence on drilling, wellbore stability, and stimulation; critical elements in designing coal completions; and geomechanical aspects in CBM-EOR and carbon dioxide sequestration.

COURSE CONTENT
- Fundamentals of geomechanics
- Concept of stress/stRAIN, in situ stresses, and principle of effective stress
Geomechanics for Drilling

Foundation – 5 days

This 5-day course is designed to introduce drilling department personnel to the fundamentals of geomechanics and its role in well programming and operations. The course will cover the stress tensor, experimental rock mechanics, as well as principal earth stresses and the origins of pore pressure (including methods for measurement of pore pressure). Course content will include details about the concept and construction of mechanical earth models (MEMs), wellbore geomechanics, modes of rock deformation, and wellbore deformation. Lecture topics include how to plan for wellbore stability, implementation of geomechanics while drilling, wellbore strengthening, and drillbit mechanics. Participants will build a MEM and apply it to a proposed high-angle production well from a field development plan.

COURSE CONTENT

- Introduction
- Fundamentals of rock mechanics
- How geomechanics used to design wells and support drilling
- The stress tensor
- Experimental rock mechanics
- Principal earth stresses
- Origins of pore pressure
- Methods for measurement of pore pressure
- Concept and construction of a MEM
- Wellbore geomechanics
- Modes of rock deformation in the wellbore
- Wellbore deformation in fractured rock masses
- Planning for wellbore stability
- Implementation of geomechanics while drilling
- Wellbore strengthening
- Drillbit mechanics
- Working in teams to build an actual MEM that will be used to design a wellbore stability plan for a proposed high-angle well for the field development plan.

AUDIENCE

All drilling personnel (e.g. drilling engineers and operations/planning engineers) involved in planning well operations

PREREQUISITE

Basic knowledge of drilling and awareness of well planning and programming.

Fundamentals of Petroleum Geomechanics

Foundation – 5 days

Attendees will learn the fundamentals of rock mechanics, the origin of stresses in the subsurface, and how in situ stresses can be understood from wellbore data. This course, using classroom instruction, exercises, and workshops, teaches attendees how to apply in situ stress data to critical problems in exploration and development.

COURSE CONTENT

- Impact of geomechanics on oilfield development: Drilling, completions, and field production life
- Principal stresses, pore pressure, effective stresses, stress and strain, elasticity, yield, and failure envelopes
- Laboratory testing: Procedures, limitations, unconfined compression, triaxial compression, thick-walled-cylinder tests

AUDIENCE

Engineers, geoscientists, and technologists involved in exploration, drilling, completions, and production in unconventional reservoirs.

PREREQUISITE

Bachelor’s degree in engineering or geosciences.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- State of stress in the Earth, pore pressure, and fracture gradient
- Wellbore stability
- Mechanical earth model construction, operational aspects of wellbore stability control
- Sand production and prediction
- Reservoir geomechanics

AUDIENCE
Technical professionals or managers concerned with wellbore stability, fracture stimulation, reservoir drainage patterns, naturally fractured reservoirs, overpressures, and fault seal analysis.

PREREQUISITE
None

Mangrove Hydraulic Fracture Design Software

Advanced – 5 Days

Mangrove® engineered stimulation design is built on the industry leading Petrel® E&P platform which links reservoir characterization, stimulation, and production simulation and helps optimize completion designs in conventional and unconventional reservoirs. In addition to the conventional planar fracture simulation models, two new unconventional fracture simulation models i.e. UFM (Unconventional Fracture Model) and the wiremesh model are incorporated in the software that can simulate complex hydraulic fracture networks.

COURSE CONTENT
- Petrel Introduction for Mangrove users. Various introductory information on the use of Petrel and what is needed to run Mangrove.
- Well Setup
- Defining Zones
- Fluids and Proppants definitions
- Defining Completions
- Defining Treatment paths and pumping schedules
- 2D Fracture Networks definition in reservoir

- Defining Stimulation cases and the creating of Production Grids
- Production simulation case definitions
- NPV Analysis and the use of the Scenario manager for sensitivities
- Creating Mangrove Engineering Reports

AUDIENCE
This course is designed to introduce Reservoir Engineers, Geoscientist, Stimulation Engineers and Asset teams to the Mangrove Software.

PREREQUISITE
Petroleum Engineering, Geomechanics and Geology

COURSES OFFERED

Petrel Reservoir Geomechanics

Skill – 2 Days

This course introduces reservoir engineers and consultants to some basic concepts in geomechanics and the Petrel platform product. Attendees will learn how to incorporate data about geomechanical effects into reservoir models of well production behavior. In addition to introducing geomechanics concepts, this course presents the types of data used for geomechanical modeling in the petroleum industry, and some of the geomechanical effects observed in oil and gas reservoirs and the subsurface during hydrocarbon production. The course also includes how to build reservoir models that show geomechanical effects such as pressure, stress, and strain, as well as data on reservoir flow, illustrating the effects over time, and how to build reservoir geomechanical models using the Petrel software platform.

COURSE CONTENT
- Fundamentals of geomechanics
- Petroleum geomechanics and reservoir geomechanics
- The use of Petrel geomechanics software

AUDIENCE
Reservoir engineers and geotechnical consultants.

PREREQUISITE
Petrel reservoir engineering software and ECLIPSE reservoir simulation software.

COURSES OFFERED

Techlog Acoustics Processing and Interpretation

Skill – 5 Days

This course teaches the theory, processing and interpretation of sonic waveforms using Techlog platform. Participants will learn how to QC raw data such as waveforms, and slowness projections. Participant will also learn how to perform field data slownesses relabeling and process acoustic data for formation slownesses and anisotropy. Also, dispersion analysis tools will be explained in detail to allow users to define the most appropriate parameters for their processing.

COURSE CONTENT
- Borehole acoustics and tool theory
- Acoustics data type in Techlog
- Data import and preparation
- Visualization and QC of Waveforms
- Relabeling on field processed data
- Slowness processing theory and workflows
- Dispersion analysis and its application
- Acoustic anisotropy theory and workflows
- Anisotropy processing using four-component rotation module
- Porosity and Elastic properties calculation from Slownesses
- Application of Sonic data to Petrophysics, Geophysics, Geomechanics etc.

AUDIENCE

Technical professionals or managers concerned with wellbore stability, fracture stimulation, reservoir drainage patterns, naturally fractured reservoirs, overpressures, and fault seal analysis.

PREREQUISITE
None

Techlog Pore Pressure Prediction and Wellbore Stability

Skill – 3 Days

This 3-day course covers the fundamental theory of geomechanics for pore pressure and wellbore stability applications using Techlog® (wellbore software platform) on real examples. The basic concepts used in pore pressure prediction using effective stress method (Eaton, Bowers, Traugott) are presented. The wellbore stability theory and different modes of rock failure around the borehole are discussed in detail. Using multiple exercises, participants will build (from scratch) a mechanical earth model with Techlog and construct a mud weight window and identify drilling hazards. Then, the mechanical properties and horizontal stresses are calculated and calibrated with core data as well as with leak-off tests. Finally, different scenarios of wellbore trajectory are discussed to identify the ones with the best safe mud weight window.

COURSE CONTENT
- Pore pressure prediction
- Wellbore stability

AUDIENCE
Geomechanics engineers, geophysists, petrophysists, and anyone working on wellbore stability.

PREREQUISITE
Basic Techlog knowledge
Petrophysics, Geophysists, Geomechanics engineers, Log analysts and any user working with borehole acoustic data such as formation slownesses.

**PREREQUISITE**
Techlog Fundamentals

**Mangrove Express Hydraulic Fracture Design**

**Skill – 3 Days**

Mangrove Express® fracture design in the Petrel platform is an efficient and powerful software that optimizes reservoir-centric completions using multiple options for fracture simulators, best-in-class visual interpretation tools and robust sensitivity analysis capabilities. The formulation of Mangrove Express design fracture models is based on extensive laboratory and field experiments and are continuously improved as advancements are made in the industry.

**COURSE CONTENT**

Petrel Introduction for Mangrove users. Various introductory information on the use of Petrel and what is needed to run Mangrove.

- Well Setup
- Defining Zones
- Defining Completions and use of Completion Advisor
- Fluids and Proppants definitions
- Defining treatment path
- Defining Stimulation path

**AUDIENCE**

This course is designed to introduce Completion Engineers, Reservoir Engineers, Geoscientist, Stimulation Engineers and Asset teams to the Mangrove Express Software.

**PREREQUISITE**
Completion Engineering, Petroleum Engineering, Geomechanics and Geology.

**Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics**

**Skill – 5 Days**

This course starts by teaching the fundamentals of acoustic waveform propagation in a borehole and how the waveforms recorded by an array sonic tool can be processed and interpreted to obtain valuable quantitative information about the petrophysical and mechanical properties of the rocks. It contains an overview of sonic acquisition technologies (both Wireline and LWD) and explains the different constraints and limitations of each measurements (monopole, dipole, quadrupole). Finally, an overview of the different applications of sonic data for geomechanical applications, petrophysics, and geophysics is provided.

**COURSE CONTENT**

- Overview acoustic logging and its applications in the oil & gas industry
- Fundamentals of borehole acoustics and wave propagation theory
- Understand sonic tool hardware with examples from different Wireline and LWD tools
- Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc).
- Import DLIS data containing sonic waveforms and use Techlog to assign tool-specific properties
- Theory of semblance processing and slowness estimation from array waveform data
- Non-dispersive slowness time coherence (STC) processing workflow
- The importance of dispersion analysis for identifying best processing parameters
- The concept of anisotropy in the earth and how it is measured
- The different mechanisms of acoustic anisotropy and their applications in the oil&gas industry
- Understanding the shale anisotropy and how to characterize it using sonic data
- Applications of anisotropy to Drilling and completion applications (stress direction, fractures, shale anisotropy, etc)
- Case study for an exploration well: run the full P&S workflow, derive the best slownesses combining monopole and dipole results.
- Petrophysics applications of sonic data (sonic porosity, Stoneley permeability, etc)
- Geophysics applications of sonic data

**AUDIENCE**

Anyone who desires an increased understanding of acoustic data from sonic tools and how to integrate them into their workflows.

**PREREQUISITE**
Basic understanding of geoscience and petroleum engineering

**Reservoir Geomechanics with Petrel**

**Skill – 5 Days**

This course covers the necessary fundamentals of reservoir geomechanics in a 3D environment; the origin of stresses in the subsurface and how in situ stresses could be understood using wellbore data, seismic and geological interpretations. Using the Finite Element Method, computed stresses and deformations can be calibrated against measurements, but moreover, changes in the in-situ stress state could be computed due to changes in reservoir pressures along with their impact on reservoir performance; mechanical properties such as rock strength, deformability and pore collapse, how they can be measured in the laboratory and translated into numerical modeling.

**COURSE CONTENT**

- Fundamentals of reservoir geomechanics
- Value of full-field geomechanics in the petroleum industry
- Review of geomechanics concepts and how these are applied in the petroleum industry; understand the concepts of stress, strain, effective stress, principals stresses, elasticity, plasticity and failure
• Geomechanics property modeling; use of wireline derived rock mechanical properties together with seismic attributes and geostatistical methods for 3D property modeling

• Experimental rock mechanics for reservoir geomechanics studies; Review of standard rock mechanics testing and introduction to laboratory measurements specific to reservoir geomechanics applications; understanding of test results and ability to analyze and evaluate laboratory reports

• Reservoir geomechanics processes and introduction to PetrelRG

• Understand the mechanics of depletion, stress transfer between reservoir and surrounding formations, theory and compaction and subsidence, importance of stress path, thermal effect, impact of faults and fractures; Understand the importance and stress initialization to model in-situ stress state

• Introduction to reservoir Geomechanics modeling with PetrelRG

• Building reservoir geomechanics grids, design geomechanics materials and perform property modeling and property population

• Geomechanical property modeling and stress initialization with PetrelRG

• Case study: geomechanics property modeling using seismic inversion as input

• Discontinuities (faults and fractures) in reservoir geomechanics models

• Apply initial pressure, temperature and saturation to reservoir geomechanics models, define boundary conditions and perform stress initialization

• Coupled reservoir Geomechanics simulation with PetrelRG

• Case study: practical aspects of in-situ stress calibration

• Define and submit simulation cases with coupled reservoir simulator

• Perform 1-way and 2-way coupled simulations

• Basic ECLIPSE knowledge important for coupled reservoir geomechanics modeling and introduction to history matching assisted by 2-way reservoir geomechanics modeling

• Reservoir geomechanics model results analysis with PetrelRG

• Results analysis; import coupled simulator results to PetrelRG; stress charting and results QC

• Application of reservoir geomechanics to reservoir management; utilization of reservoir geomechanics models to examine cap-rock integrity and casing deformation in depleting reservoirs

• Post processing case studies – application of reservoir geomechanics model results to common reservoir management tasks; 3D wellbore stability planning, hydraulic fracture design, geomechanics-driven permeability updating

AUDIENCE

Geomechanists, geologists, geophysicists, production engineers, completion engineers, reservoir engineers, and asset managers concerned with reservoir management, gas and / or water injection, EOR, HPHT field management and long-term reservoir forecasting.

PREREQUISITE

None
Reservoir Engineering

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked ❗️, while technical courses that use software have been marked 🔌, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with ⬇️. There are some courses that use simulators and are highlighted with ⚡️.

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<tr>
<td>Reservoir Characterization</td>
<td>Characterization, Evaluation and Enhanced Oil Recovery in Naturally Fractured Reservoirs</td>
<td>Full Life Cycle Fluid Evaluation - Downhole to Laboratory</td>
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<tr>
<td>Reservoir Analysis</td>
<td>Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane</td>
<td>Assuring Flow From Pore to Process: Basics, Modeling, and Lab</td>
<td>Reservoir Management</td>
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<tr>
<td>Reservoir Management</td>
<td>Analysis of Production Performance Curves</td>
<td>Simulation of Naturally Fractured Reservoirs</td>
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<td>Resources and Reserves Evaluation</td>
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<td>Applied History Matching</td>
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<tr>
<td>Applied Reservoir Simulation</td>
<td>Reservoir Geomechanics with Petrel</td>
<td>Formation Testing: Wireline and LWD</td>
<td>Waterflood Management</td>
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<tr>
<td>Techlog Saturation Height Modelling</td>
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<td>Applied Geostatistics for Petroleum Engineers and Geoscientists</td>
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<td>Advanced Well Test Analysis</td>
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<td>Skill</td>
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<td>Petrol Reservoir Engineering</td>
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<td>Applied Reservoir Engineering</td>
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<td></td>
<td>ECLIPSE Blackoil Reservoir Simulation</td>
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<td>Foundation</td>
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<td></td>
<td>Fundamentals of Field Development Planning</td>
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<td></td>
<td>Enhanced Oil Recovery Processes: Chemical, Miscible, and Thermal</td>
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<td>Well Test Design and Analysis</td>
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<td>Natural Gas Reservoir Engineering</td>
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<td>PVT Properties of Reservoir Fluids</td>
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<td>Integrated Reservoir Management</td>
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<td>Practical Reservoir Engineering with Petrel and ECLIPSE</td>
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### COURSE OFFERINGS

Visit NExTtraining.com/classes for the latest calendar or to register for a course.

### IMMERSIVE LEARNING PROGRAMS

### COMPETENCY MANAGEMENT

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<td>COMPETENCY LEVEL</td>
<td>ECLIPSE</td>
<td>Petrel</td>
<td>OFM</td>
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<tr>
<td>ADVANCED</td>
<td>Petrel Proxy Modeling and Optimization</td>
<td>OFM Waterflood Monitoring and Surveillance</td>
<td>MEPO Advanced</td>
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<td>SKILL</td>
<td>ECLIPSE Advanced Topics</td>
<td>Petrel Advanced Wells</td>
<td>OFM Intermediate Using Oil Operations Examples</td>
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<td>ECLIPSE Compositional Simulation</td>
<td>Petrel Uncertainty Analysis and Assisted History Matching</td>
<td>OFM Intermediate Using Gas Operations Examples</td>
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<td>Chemical Methods for Enhanced Oil Recovery with ECLIPSE</td>
<td>Petrel Reservoir Geomechanics</td>
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<td>Petrel Well Design</td>
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<td>Petrel Workflow Editor and Uncertainty Analysis</td>
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<td>Petrel Production Data Interpretation and Forecasting</td>
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<tr>
<td>FOUNDATION</td>
<td>ECLIPSE Applied Reservoir Simulation Fundamentals</td>
<td>Petrel Reservoir Engineering</td>
<td>OFM Fundamentals Using Gas Operations Examples</td>
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<td>ECLIPSE Blackoil Reservoir Simulation</td>
<td>Studio for Petrel Users</td>
<td>OFM Fundamentals Using Oil Production Examples</td>
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<td>FrontSim Streamline Reservoir Simulation</td>
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<td>AWARENESS</td>
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<td>INTERSECT</td>
<td>Mangrove</td>
<td>Infrastructure</td>
<td>Integrated Asset Modeler</td>
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<td>Mangrove Hydraulic Fracture Design Software</td>
<td>Cluster Management for IT Professionals</td>
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<td>Petrel Fracture Modeling: Discrete Fracture Network Construction</td>
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Characterization, Evaluation, and Enhanced Oil Recovery in Naturally Fractured Reservoirs

Advanced – 5 Days

This course will update attendee knowledge on techniques for an integrated study of naturally fractured reservoirs, including characterization, experimentation, and integration of information to determine the best process options. Attendees will examine examples from ongoing CO₂ pilots to reinforce their understanding of naturally fractured reservoirs. The attendees will also learn to use core laboratory measurements of imbibition, capillary pressure, and wettability at reservoir conditions; history-matched laboratory measurements for upsampling to reservoir geometry, and wettability data for prediction of waterflood performance in addition to analyzing reservoir performance during water injection from laboratory experiments of forced and free-fall gravity drainage with CO₂, and use commercial simulators to match reservoir performance using precisely measured lab and field data.

COURSE CONTENT

• Characterization of naturally fractured reservoirs
• Geologic and petrophysical analysis of reservoir cores
• Screening reservoir data for waterflood and gas injection-well candidates
• Core-log integration and reservoir characterization
• Development of specific algorithms for log evaluation (identification of pay zones and water saturation in the pay)
• Fracture identification (natural or coring-induced) and characterization
• Well test analysis and analysis of inflow performance in horizontal wells
• Imbibition, capillary pressure, interfacial tension, and wettability determination
• Scaling laboratory results to predict waterflood response
• Numerical simulation of waterflooding
• Phase behavior and minimum miscibility pressure determination
• Gas injection experiments in fractured systems
• Evaluation, scaling, and design of gas injection results
• Case histories: Midale CO₂ pilot and Wellman Unit CO₂ flood

AUDIENCE

Reservoir engineers, geoscientists, operating personnel, and other asset team members involved in reservoir management.

PREREQUISITE

Experience in oilfield and gas field operations and knowledge of naturally fractured reservoirs.

Full Life Cycle Fluid Evaluation: Downhole to Laboratory

Advanced – 5 Days

Advanced-level instruction focuses on technologies for characterization of reservoir fluids in situ and methods for capture of a representative sample. Attendees will learn the importance of proper sample handling and the procedures that define fluid properties (vapor-liquid equilibrium phase envelopes, gravimetric fluid properties, and hydrocarbon solids) and rheological transport characteristics. Hands-on demonstrations include developing mathematical models using equations of state (EOS) for fluid PVT analysis, and hydrocarbon solids phase boundaries for applications in reservoir simulations, production modeling, and surface processing.

COURSE CONTENT

• Physics of reservoir fluids, including origin of fluid gradients, and reservoir compartmentalization
• Downhole fluid-analysis technology: monitoring mud-filtrate contamination, live fluid analysis, component analysis, and in situ analysis
• Sample quality control and reservoir characterization workflow examples
• New developments in EOS for in situ crude oil
• Methods for determining reservoir connectivity
• Openhole sampling technologies, including MDT* modular formation dynamics tester
• Visit to a technology or operations center for physical demonstration of downhole sampling and analysis tools (location dependent)
• Cased hole sampling during well or production testing and laboratory fluid characterization technologies
• Workflows to develop thermodynamic and transport characteristic models
• Fundamentals of lab characterization of hydrocarbon solids (asphaltene, wax, hydrate)
• Visit to fluids and flow assurance analysis center for physical demonstration of equipment and measurement methods (location dependent)

Production Data Analysis: Shale Gas, Tight Gas, and Coal-Bed Methane

Advanced – 3 Days

This course is designed to implement a comprehensive learning module of production data interpretation and analysis, including the principles of production fundamentals, technologies, and workflows with applications and field examples for unconventional resources. Production analysis requires handling and conditioning large volumes of multiple source, multiple frequency data, identifying and synchronizing events, and assigning the appropriate production rate to each event. These critical steps enable production engineers to make efficient interpretation and analysis of the data and to optimize well productivity using advanced methodologies.

COURSE CONTENT

• Science: foundational understanding of principles and governing factors of production
• Technologies: exposure to sensor technologies and tools necessary for data conditioning
• Workflows: skills to apply methodologies and workflows to enable data interpretation and analysis

Assuring Flow from Pore to Process

Advanced – 3 Days

From this course on flow assurance, attendees will gain an advanced understanding of fluid flow through a series of interconnected systems from the reservoir to surface facilities, and the prevention and mitigation of common flow impediments.
The attendees will learn best practices from worldwide field examples, as well as how to design fit-for-purpose flow assurance solutions.

**COURSE CONTENT**
- Key flow assurance issues
- Technologies for capture and characterization of fluid samples
- Methodologies for measurement, modeling, and management of inorganic and organic solids
- Fluid flow and heat-transfer characteristics and their importance in design of subsea architecture, model selection, and liquids management
- Processes of fluid flow integration, heat transfer, and solids

**AUDIENCE**
Engineers and technical staff responsible for well surveillance, production optimization, or completion design.

**PREREQUISITE**
Working knowledge of well production behaviors, basic reservoir engineering principles, and surface facilities; exposure to well completion design, nodal analysis, and simulation processes.

### Analysis of Production Performance Curves
**Advanced – 5 Days**

In this workshop on classic and current decline curve analysis methods, attendees learn both theory and applications to single- and dual-fluid production systems. The attendees will explore methods to amend a nonconverging production curve, forcing it to the economic limit, and learn how to reinitialize decline curves in addition to studying methods for material balance time and real-time relationships, analysis of performance histories, generation of relative permeability ratios from field data, and the derivative approach to determine whether water breakthrough is from coning or behind pipe.

**COURSE CONTENT**
- Decline curve analysis
- Arps curves: nominal and continuous exponential declines
- Performance curves: exponential, hyperbolic, and harmonic declines
- Fetkovich, Arps, and transient type curves
- Interpretation of field curves for reservoir characterization
- Pseudosteady-state flow equation
- Blasingame-Lee solution
- Production performance plots

**AUDIENCE**
Engineers, geoscientists, and industry professionals interested in analyzing oil and gas performance data.

**PREREQUISITE**
Some knowledge of oil and gas production, Excel spreadsheets, and basic algebra.

### Simulation of Naturally Fractured Reservoirs
**Advanced – 5 Days**

This 5-day course covers the oil recovery mechanisms in fractured reservoirs that undergo the waterflood or gas cap expansion and gas injection. How dual porosity reservoirs are modeled with modern numerical simulators and simulation exercises will also be covered. Participants will also learn about the fundamentals of fractured reservoirs, the geological aspects, and well testing in fractured reservoirs. Oil recovery mechanisms, advanced topics in dual porosity simulation, and dual simulation of fractured reservoirs with a compositional simulator will also be covered. The simulation of triple porosity systems will be discussed during the course.

**COURSE CONTENT**
- Fractured reservoir fundamentals
- Well testing in fractured reservoirs
- Oil recovery mechanisms
- Diffusion and discretized matrix model
- Simulation of fractured reservoirs and porosity systems

**AUDIENCE**
Engineers, managers, and other oilfield technical staff

**PREREQUISITE**
Completion of the Applied Reservoir Simulation and ECLIPSE* 100 Software course is required along with experience using ECLIPSE* 100 simulator and ECLIPSE 100/200 advanced course is recommended

### Resources and Reserves Evaluation Workshop
**Advanced – 5 Days**

This 5-day course presents various reserve estimating methodologies, including the difference between resources and reserves. The classifications and definitions of these reserves and resources, along with a guideline for the application of these definitions will be covered. SPE, WPC, AAPG, SEC, and other regulatory authority guidelines will be discussed.

The course will update G&G and reservoir engineers with the newest and most accurate methods for obtaining the value of a reserve. Following the completion of this course, all participants should be able to manage deterministic and probabilistic methods, with a thorough understanding of various reserve levels and their equivalence in both systems.

**COURSE CONTENT**
- Resource classification
- Petroleum economics
- Deterministic reserves
- Statistics, probability, and uncertainty
- Reserve estimation

**AUDIENCE**
Individuals with both geoscience and engineering backgrounds.

**PREREQUISITE**
Degree in engineering or geosciences and basic knowledge of reservoir engineering

### History Matching and Reservoir Optimization
**Advanced – 5 Days**

Production data are incorporated into high-resolution reservoir models through conventional and fast flow simulation techniques such as streamline models. In this course, attendees will learn different history-matching workflows and their merits, including assisted and automatic history matching, in addition to exploring the many forms of production data, pressure transient test, tracer test, multiphase production history, and interpreted 4D seismic information. Field examples illustrate the advantages and limitations of these techniques.

**COURSE CONTENT**
- History matching: broad perspectives and current status
- History-matching workflows
- Production data integration: background and theory
- Flow simulation through geologic models: streamline approach
- Streamline-based production data integration
- Assisted history matching and inverse modeling with finite-difference models
- History matching: field applications
- Experimental design: background and applications
- Recent developments in history matching: ensemble Kalman filter and Markov chain Monte Carlo

**AUDIENCE**
Practicing geoscientists and engineers, especially those involved in reservoir simulation.

**PREREQUISITE**
Knowledge of basic mathematics, petroleum geology, reservoir engineering, and petrophysics, plus elemental software skills.

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**Applied Reservoir Simulation**
**Skill – 5 Days**

Development of reservoir simulation programs is the focus of this comprehensive course. Attendees will learn about model selection, data preparation, and grid design, as well as techniques for model calibration. Discussion includes advanced concepts such as "pseudo" relative permeability and capillary pressure. This course will increase your understanding of the role of simulation in reservoir management by studying the limitations and structural aspects of the models and their impact on reservoir performance; mechanical properties such as rock strength, deformability, and pore collapse, how they can be measured in the laboratory and translated into numerical modeling.

**COURSE CONTENT**
- Fundamentals of reservoir geomechanics
- Reservoir geomechanics processes and introduction to PetrelRG
- Geomechanical property modeling and stress initialization with PetrelRG
- Coupled reservoir Geomechanics simulation with PetrelRG
- Reservoir geomechanics model results analysis with PetrelRG

**AUDIENCE**
Engineers, managers, and other oilfield technical staff

**PREREQUISITE**
None

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**Techlog Saturation Height Modelling**
**Skill – 2 Days**

In this course, you will learn how to handle, prepare and interpret core and petrophysical data from a wellbore centric perspective. You will learn how to build integrated interpretation workflows to provide input to your static reservoir model. You will import capillary pressure data from core, quality check the core data and perform core data processing. You will then create saturation models using petrophysical properties and refine the saturation model parameters by comparing it to log saturation. The workflow is completed by exporting the refined model for static reservoir modelling.

**COURSE CONTENT**
- Capillary pressure data handling (Data import, QC and processing)
- Generating a capillary pressure model using petrophysical properties for different rock types in a multi pore throat environment
- Optimizing the capillary pressure model in log domain
- Solving for free water level, FWL per hydraulic zone in a multizone environment

**AUDIENCE**
Reservoir Engineers and Petrophysicists

**PREREQUISITE**
Basic understanding of Petrophysics and Techlog Fundamentals

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**Formation Testing: Wireline and LWD**
**Skill – 5 Days**

This 5-day course consists of theoretical and practical classroom sessions with the last day devoted to wireline, LWD and PVT laboratory visits to observe formation testing (FT) tools and PVT laboratory facilities and experiments. Presentations on the tools, operations, and the latest interpretation methods are a part of this course. The attendees will also have various practical exposure sessions with real data and InSitu Pro* real-time quality control and interpretation software (each participant should bring his own Windows based PC). This course consists of 50% classroom and 50% practical with exercises and laboratory visits.

**COURSE CONTENT**
- FT applications
- Pressure surveys and gradient analysis
- Sampling and downhole fluid analysis
- FT pressure transients in-situ stress testing

**AUDIENCE**
Reservoir engineers, geoscientists, operations geologists, and well log witnesses with little or no prior knowledge of formation testing services.
Reservoir Management and Monitoring

Skill – 5 Days

This course covers the basic techniques used in modern reservoir management and related reservoir monitoring. The reservoir management process includes data analysis, reservoir dynamic modeling, production operations, surface facilities, and related project evaluation and economics. The general aspects of reservoir monitoring and planning are also covered.

COURSE CONTENT

- Reservoir management process
- Reservoir model
- Production operations
- Surface facilities
- Project evaluation
- Economics
- Project selection and revision
- Overview of reservoir monitoring
- Saturation monitoring
- Quick data analysis methods

AUDIENCE

Engineers, geoscientists, operating personnel, other actual or potential asset team members.

PREREQUISITE

The course is meant for engineers, geoscientists and operating personnel, basic knowledge and experience in the related field is required.

Waterflood Management

Skill – 5 Days

For efficient asset management, attendees will gain a better understanding of waterflooding and the distribution of immiscible fluids in a reservoir, the process of immiscible fluid displacement in a reservoir, waterflood patterns, and the effect of pattern selection and orientation on flood performance. Attendees will learn to predict waterflood performance using classical prediction methods.

COURSE CONTENT

- General waterflooding
- Effects of drive mechanisms on waterflooding
- Rock properties and waterflooding
- Drainage process
- Capillary pressure
- Displacement processes and linear fractional flow theory
- Buckley-Leverett frontal advance model, Welge prediction method
- Analysis of waterflood pattern mobility ratio
- Pattern configurations
- Waterflood performance efficiencies and predictions
- Prediction methods: Stiles, Craig-Geffen-Morse, and Dykstra-Parsons
- Simulation of waterflooding and practical guidelines for reservoir simulators
- Simulation of waterflooding using small- and large-scale models for calibration
- Waterflood field examples and project presentations

AUDIENCE

Engineers responsible for evaluation of the economics, production potential, and waterflood design for reservoirs under waterflood or candidates for waterflood.

PREREQUISITE

General knowledge of fluid and rock properties and fluid flow in porous media.

Applied Geostatistics for Petroleum Engineers and Geoscientists

Skill – 5 Days

Your goal in this course is to produce a consistent reservoir description through integration of core, well log, and seismic data and application of geostatistical techniques. Attendees will learn the reservoir modeling workflow, from construction of the 3D static reservoir model through upscaling for dynamic reservoir simulation in addition to increasing your awareness of geostatistics and the situations that can benefit from application of geostatistical techniques. Instruction includes guidance through assembly and analysis of the required data for geostatistical techniques and the resulting numerical models.

COURSE CONTENT

- Basic probability theory and univariate and bivariate statistics
- Geologic content of data and spatial continuity of rock properties using variogram analysis
- Estimation methods, including various types of kriging
- Simulation methods, including sequential Gaussian simulation and indicator simulation
- Advanced geostatistical techniques, including object modeling and simulated annealing
- Techniques for upscaling and data integration (3D seismic and production data)

AUDIENCE

Practicing reservoir engineers, production engineers, and geoscientists working as a part of an integrated reservoir management team.

PREREQUISITE

Knowledge of basic mathematics.

Advanced Well Test Analysis

Skill – 5 Days

In this advanced course, attendees learn how to analyze various types of pressure tests, including flow tests, buildup tests, and interference tests using the Tiab’s direct synthesis (TDS) technique – an alternative to type-curve matching and regression analysis. The attendees will also gain an understanding of the complexities of interpreting pressure tests in hydraulically fractured wells, naturally fractured reservoirs, and horizontal wells. Bring your actual field data to class for interpretation using the TDS and other techniques.

COURSE CONTENT

- Theory and applications of the pressure derivative
- TDS technique for analysis of drawdown and buildup tests, estimating average drainage area pressure, and analysis of horizontal well tests
- Identification of flow regimes using the pressure derivative
- Characteristic pressure behavior for wells near one or multiple open and closed boundaries
- Effects of various wellbore and near-wellbore phenomena on test data
- Pressure tests in wells with vertical or inclined hydraulic fractures

AUDIENCE

Engineers, geoscientists, and operating personnel involved in well test analysis and related project evaluation and economics.
• Well tests in naturally fractured reservoirs
• Conventional and advanced interpretation techniques for pressure tests in multilayered reservoirs
• Application of TDS technique to multiphase-flow tests and multirate-flow tests

AUDIENCE

Engineers and geoscientists wanting a better understanding of well testing principles and advanced interpretation techniques for pressure transient tests.

PREREQUISITE

Reservoir Engineering course.

Petrel Reservoir Engineering

Skill – 5 Days

In this course, you will build a 3D simulation model inside Petrel based on geological input data, add wells and well control rules, create black oil fluid models and rock physics functions, and submit the model to the simulators. Additional lessons on Well engineering, upscaling/advanced cornerpoint gridding and some modeling options (aquifer creation, local grid refinement, creation of tartan grids, case conversion) are covered

COURSE CONTENT

• ISet up simulation case in Petrel
• Initialization and Volume Calculation
• ISimulation Run and viewing Results
• IHistory Matching and Prediction
• ISimulation study exercise
• IWell Engineering
• IUpscaling and Advanced Corner Point Grid
• IAdditional Modeling Options
• ISimulation study exercise

AUDIENCE

Development and exploration petroleum engineers, reservoir engineers and geoscientists.

PREREQUISITE

General knowledge of reservoir engineering, and/or petroleum geology and geophysics.

Applied Reservoir Engineering

Skill – 5 Days

The focus of this course is on practical reservoir engineering methods. Attendees will study real-world techniques for understanding reservoir behavior, sizing, analyzing fluids in place, optimizing recovery, and forecasting well and reservoir production.

COURSE CONTENT

• Petroleum geology and formation evaluation
• Volumetric reserves estimates
• Rock and fluid properties
• Geostatistics
• Well performance, deliverability, and testing
• Pressure transient testing of oil and gas wells
• Productivity of horizontal wells
• Gas and water coning in vertical and horizontal wells

• Decline curve analysis
• Reservoir drive mechanisms and producing characteristics
• Material balance calculations
• History matching and uncertainty assessment
• Displacement of oil and gas
• Introduction to waterflooding and enhanced oil recovery

AUDIENCE

Engineers responsible for routine reservoir characterization and management.

PREREQUISITE

Minimum 2-year degree in engineering.

ECLIPSE Blackoil Reservoir Simulation

Foundation – 5 Days

The focus of this course is on learning the ECLIPSE Blackoil reservoir simulator software, rather than simulation methodology. This fully implicit, three-phase, 3D, general-purpose black-oil simulator includes several advanced features of ECLIPSE simulator software.

COURSE CONTENT

• Overview of how a simulator initializes and executes
• Block-centered and corner-point grid geometries
• Rock and fluid properties
• Allocation of initial pressure and saturation distribution
• Aquifer definition
• Control wells under history-matching and production regime
• ECLIPSE Blackoil simulator file structure
• Input rules
• Specifying and editing input and output data
• Building and executing a simulation model
• Analysis of results through postprocessing

AUDIENCE

Reservoir engineers, geoscientists, and other technically trained individuals interested in learning the ECLIPSE Blackoil simulator.

PREREQUISITE

ECLIPSE Applied Reservoir Simulation Fundamentals course and background in reservoir engineering.

Fundamentals of Field Development Planning

Foundation – 5 Days

This field development planning course provides attendees with the fundamental approach to working with and writing an FDP. The document, which is the output of a sequence of decision- and discipline-based tasks, is designed to create a development plan. This plan is the basis for a method of developing, producing, and maintaining hydrocarbon resources, including surface design and forms an input for designing associated surface facilities. Combined documents, both subsurface and surface form the basis for financial decision. The attendees will be introduced to all these concepts as they are applied in the process of creating a development plan in relation to the reservoir life cycle.

COURSE CONTENT

• Reservoir management process
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Reservoir management concepts and expertise sources
- The reservoir model
- Data acquisition and data use
- Data integration
- Reservoir monitoring, surveillance, and characterization
- Pressure profiling in developed reservoirs
- Field development plan
- FDP concepts, reservoir appraisal, and development planning
- Case study

AUDIENCE

Multidisciplinary asset teams comprised of engineers, geoscientists, and managers involved in or will be involved in developing hydrocarbon resources, other actual or potential asset team members.

PREREQUISITE

Engineering or geoscience background.

Enhanced Oil Recovery Processes: Chemical, Miscible, and Thermal

Foundation – 5 Days

For a better understanding of miscible, polymer, and thermal enhanced oil recovery (EOR) processes, this course presents attendees with the theoretical and practical aspects of each process. Case studies and field examples will also be presented.

COURSE CONTENT

- Introduction to EOR methods
- Screening criteria and technical constraints
- Displacement fundamentals
- Miscible flooding: Fundamentals and applications, and miscible simulator
- Polymer flooding: Applications, rheology of polymer solutions, and polymer adsorption and retention
- Micellar-polymer or microemulsion flooding
- Thermal processes
- Simulation models as reservoir management tools
- EOR performance evaluation: Field cases and exercises

AUDIENCE

Reservoir engineers, production engineers, and geoscientists interested in EOR or involved in EOR projects from a planning or operational perspective.

PREREQUISITE

Basic knowledge of reservoir engineering.

Well Test Design and Analysis

Foundation – 5 Days

Gain a solid understanding of the theories underlying well test analysis and interpretation and of how to design a well test to achieve specific objectives. Attendees will learn the different types of tests and techniques, both analytical and graphical, for data representation and analysis in addition to how to interpret complex data such as those from well tests in naturally fractured reservoirs, hydraulically fractured wells, horizontal wells, and gas and gas-condensate reservoirs.

COURSE CONTENT

- Analysis of reservoir fluid properties
- Identification of the five reservoir fluids
- Compositional gradients in reservoirs

Natural Gas Reservoir Engineering

Foundation – 5 Days

This course covers various aspects of gas reservoir engineering, including well test analysis. Course attendees will increase their understanding of natural gas properties, and learn how to determine gas reserves using material balance calculations and perform gas deliverability and nodal analyses.

COURSE CONTENT

- Fundamentals of gas reservoir engineering
- Properties of natural gas
- Determination of gas reserves
- Gas deliverability
- Nodal analysis
- Gas well testing

AUDIENCE

Reservoir engineers, production engineers, laboratory researchers, and gas field operators.

PREREQUISITE

Basic knowledge of petroleum engineering.

PVT Properties of Reservoir Fluids

Foundation – 5 Days

This course presents the newest and most accurate methods for obtaining values of reservoir fluid properties from laboratory data and correlations. Attendees will gain a better understanding of the relationships between the five reservoir fluids in addition to learning how to manage problems concerning reservoir fluid properties with increased confidence.

COURSE CONTENT

- Analysis of reservoir fluid properties
- Identification of the five reservoir fluids
- Compositional gradients in reservoirs

Well Test Design and Analysis

Foundation – 5 Days

Gain a solid understanding of the theories underlying well test analysis and interpretation and of how to design a well test to achieve specific objectives. Attendees will learn the different types of tests and techniques, both analytical and graphical, for data representation and analysis in addition to how to interpret complex data such as those from well tests in naturally fractured reservoirs, hydraulically fractured wells, horizontal wells, and gas and gas-condensate reservoirs.

COURSE CONTENT

- Introduction to EOR methods
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- Displacement fundamentals
- Miscible flooding: Fundamentals and applications, and miscible simulator
- Polymer flooding: Applications, rheology of polymer solutions, and polymer adsorption and retention
- Micellar-polymer or microemulsion flooding
- Thermal processes
- Simulation models as reservoir management tools
- EOR performance evaluation: Field cases and exercises

AUDIENCE

Reservoir engineers, production engineers, and geoscientists interested in EOR or involved in EOR projects from a planning or operational perspective.

PREREQUISITE

Basic knowledge of reservoir engineering.

Well Test Design and Analysis

Foundation – 5 Days

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- Thermal processes
- Simulation models as reservoir management tools
- EOR performance evaluation: Field cases and exercises

AUDIENCE

Reservoir engineers, production engineers, and geoscientists interested in EOR or involved in EOR projects from a planning or operational perspective.

PREREQUISITE

Basic knowledge of reservoir engineering.

Well Test Design and Analysis

Foundation – 5 Days

Gain a solid understanding of the theories underlying well test analysis and interpretation and of how to design a well test to achieve specific objectives. Attendees will learn the different types of tests and techniques, both analytical and graphical, for data representation and analysis in addition to how to interpret complex data such as those from well tests in naturally fractured reservoirs, hydraulically fractured wells, horizontal wells, and gas and gas-condensate reservoirs.
• Properties of black oils from laboratory reports and correlations (featuring recent calculation procedures and correlations)
• Field data required for use of reservoir fluid property correlations
• Properties of dry gases (featuring several recent correlations)
• Properties of wet gases and applications and computations
• Properties of retrograde gas and condensates (recent correlations)
• Condensates from laboratory reports
• Suggestions for obtaining water properties

**AUDIENCE**
Reservoir engineers, production engineers, and others involved in reservoir fluid sampling, testing, and modeling.

**PREREQUISITE**
Degree in engineering or science and experience in the petroleum industry.

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**Integrated Reservoir Management**

**Foundation – 5 Days**

Course attendees will learn the basic reservoir management techniques used by asset management teams.

**COURSE CONTENT**
• Reservoir management process
• Data acquisition
• Analysis and modeling
• Reservoir model
• Production operations
• Reservoir management economics
• Desktop simulation
• Case studies: new fields, mature fields, waterfloods, and enhanced oil recovery projects

**AUDIENCE**
Engineers, geoscientists, operating personnel, and other asset team members.

**PREREQUISITE**
Experience in oilfield and gas field operations.

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**Practical Reservoir Engineering with Petrel and ECLIPSE**

**Foundation – 5 Days**

During the first 3 days key reservoir engineering concepts such as reservoir drive mechanisms, volumetrics, petroleum fluid properties and recovery factors will be introduced as tools. Remaining 2 days will take the participants through basic concepts of Reservoir Simulation modules. Participants will be introduced to the building of simple simulation models using Petrel and ECLIPSE Software. History matching and Prediction exercises will also be carried out during the course.

**COURSE CONTENT**
• Fundamentals & Darcy’s Law
• Well and Reservoir Concepts
• Well Testing and Analysis

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**Introduction to Reservoir Engineering**

**Awareness – 3 Days**

This course on reservoir engineering introduces attendees to the classic and current techniques used to obtain reservoir fluid properties from laboratory data and correlations. The attendees will learn the fundamental concepts of fluid flow, including laminar and non-Darcy flow in multiphase situations. Basic theory and practice of well test analysis are presented as a means for preparing input data for the reservoir simulation modeling. Exercises and examples demonstrate applications to actual situations.

**COURSE CONTENT**
• Introduction to reservoir engineering
• Reservoir types and lithologies
• Reservoir fluid properties: Pressure-volume-temperature data, specific gravity, bubblepoint pressure, gas/oil ratio, viscosity, and formulation volume factor
• Reservoir rock properties: Porosity, permeability, formation capacity, and net pay thickness
• Fundamentals of fluid flow in porous media
• Darcy’s law
• Reservoir classification and drive mechanisms
• Oil and gas inflow and outflow performance
• Pressure buildup analysis
• Oil displacement and enhanced recovery
• Basic concept of reservoir simulation modules

**AUDIENCE**
Junior-level reservoir engineers, production engineers, and development geologists wanting to learn reservoir fundamentals, monitoring, and production enhancement techniques.

**PREREQUISITE**
None

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**Petrel Proxy Modeling and Optimization**

**Advanced – 2 Days**

This course covers how to begin using experimental designs with the Petrel platform. Because running simulations is computer processing unit (CPU) intensive, there is a long tradition for designing computer experiments to reduce the number of runs necessary in assessing the primary relations between input parameters and computed response. In the Petrel platform, several tools are available that assist the user in making surrogate models – proxy models – that can mimic the simulation model and that are inexpensive to evaluate. These models can be useful in sensitivity studies, development scenario assessments, and in optimization operations; e.g., completion attribute design. This course is workflow based in which previous Petrel platform knowledge is used to solve the tasks described.

**COURSE CONTENT**
• The Uncertainty and optimization process

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
· Proxy models and their creation
· Analysis of input data
· Using proxy models for sensitivity and uncertainty workflows
· Optimization operations set up and run
· Optimization using a proxy

AUDIENCE
Experienced reservoir engineers, reservoir geologists, and geophysicists with solid reservoir engineering knowledge.

PREREQUISITE
Petrel Assisted History Matching and Uncertainty Analysis course or equivalent Petrel experience.

OFM Waterflood Monitoring and Surveillance

Advanced – 1 Days

In this 1-day course, the OFM Streamline module will be used to automatically or graphically define waterflood patterns with production and reservoir data. By combining this information with pressure data and PVT algorithms, reservoir volumes and voidage can be determined. Attendees will also gain experience in setting up patterns and performing analyses on a waterflood project.

COURSE CONTENT
· Configuring static and dynamic patterns
· Using pressure and PVT data
· Loading reservoir property data
· Reviewing the performance of the waterflood as a whole
· Analyzing the waterflood by pattern
· Calculating voidage replacement ratios and comparing by pattern
· Creating grid maps by well and pattern
· Creating waterflood control diagnostic and Hall plots
· Using the OFM Sweep module to estimate pattern configurations and pattern outlines

AUDIENCE
Anyone with a need for to experience in setting up patterns and performing analyses on a waterflood project in OFM* well and reservoir analysis software.

PREREQUISITE
OFM software proficiency or OFM Fundamentals course

OFM Waterflood Monitoring and Surveillance

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· Creating grid maps by well and pattern
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· Using the OFM Sweep module to estimate pattern configurations and pattern outlines

AUDIENCE
Anyone with a need for to experience in setting up patterns and performing analyses on a waterflood project in OFM* well and reservoir analysis software.

PREREQUISITE
OFM software proficiency or OFM Fundamentals course

MEPO Advanced

Advanced – 2 Days

This course has been designed to introduce some advanced capabilities of the MEPO optimizer software to reservoir engineers and asset teams involved with related disciplines. The uncertainty parameter is very important with respect to defining distributions and also maintaining correlation among them when they are changing individually. During the history match session, data quality control, ranking parameters for history matching, and a structured workflow example will be presented. Proxy modeling techniques will be discussed. Production optimization will also be covered, in addition to spreadsheet mapping, NPV calculation, dynamic scheduling of infill wells, and constraint handling. All of these subsections will be practiced by running a tutorial. The remainder of the course is dedicated to reviewing new MEPO optimizer options practice on more applied tasks and emphasis on the use of several MEPO optimizer applications. Using a carefully selected example cases and exercises, the attendees will gain an understanding of methods and modeling techniques that will enable them to make use of the MEPO optimizer in their routine tasks.

COURSE CONTENT
· Large field history matching
· Integrated modeling
· Optimization of well placement
· Spreadsheet tools for NPV optimization
· Scripts
· Constraint handling in the MEPO optimizer

AUDIENCE
Reservoir engineers.

PREREQUISITE
None

Reservoir Optimization using Applied Oilfield Manager (OFM) Software

Advanced – 5 Days

In this hands-on workshop, attendees apply engineering principles in a real-world scenario and perform reservoir development exercises through multiple phases. This workshop will help attendees develop their capacity to make unique reservoir engineering decisions involving field development, and improve their skills in day-to-day use of OilField Manager* well and reservoir analysis software.

COURSE CONTENT
· Reservoir familiarization and evaluation
· Production phase and workover candidate recognition
· Well volumetric drainage radius, horizontal well analysis, and workover follow-up
· Workover candidate recognition and waterflooding pilot analysis
· Waterflooding evaluation and surveillance

AUDIENCE
Petroleum engineers, reservoir engineers, production enhancement engineers,
geologists, and operations and business development managers interested in analyzing oil and gas performance data.

**PREREQUISITE**
Knowledge of oil and gas production, Microsoft Excel® spreadsheets, and basic algebra.

### Mangrove Hydraulic Fracture Design Software
**Advanced – 5 Days**

His 5-day course will focus on Mangrove®-engineered stimulation design, which is built on the Petrel® E&P platform and links reservoir characterization, stimulation, and production simulation and helps optimize completion designs in conventional and unconventional reservoirs. In addition to the conventional planar fracture simulation models, two new unconventional fracture simulation models—UFM® unconventional fracture model and the wiremesh model—are incorporated into the software to simulate complex hydraulic fracture networks. Mangrove design enables optimized completion design, which helps in maximizing production performance and improved ROI in tight sand, shale, and conventional reservoirs.

**COURSE CONTENT**
- Petrel introduction for mangrove users, including introductory information on the use of Petrel platform and what is needed to run Mangrove design
- Well setup
- Defining zones
- Fluids and proppants definitions
- Defining completions
- Defining treatment paths and pumping schedules
- 2D fracture networks definition in reservoir
- Defining stimulation cases and creating production grids
- Production simulation case definitions
- NPV analysis and the use of the Scenario manager for sensitivities
- Creating Mangrove design engineering reports

**AUDIENCE**
Engineers, geoscientists, stimulation engineers, and asset teams

**PREREQUISITE**
Petroleum engineering, geomechanics, and geology

### Cluster Management for IT Professionals
**Advanced – 5 Days**

This 5-day course introduces the concepts and deployment of an LSF cluster computing environment for ECLIPSE and INTERSECT reservoir simulators under RedHat Linux and the deployment and use of the simulation cluster manager (SCM) application on a Linux cluster hardware configuration. The first part of the course focuses on theoretical awareness of reservoir simulation to enable participants to understand the important role the cluster plays in supporting the reservoir simulation process. Next, participants will then be taken through the process of deploying a simulator cluster, including installation, configuration, use, maintenance, and troubleshooting.

The course includes a detailed overview of the different concepts, functionalities, and tasks of the SCM software, including cluster and workload management, reporting, monitoring, and job submission. All tasks are complemented with hands-on exercises.

**COURSE CONTENT**
- General reservoir simulation process and how the simulation cluster software improves it
- ECLIPSE/INTERSECT cluster architecture and components
- Installation, configuration, and validation of a working ECLIPSE/INTERSECT cluster
- Submission and monitoring of simulation jobs
- Performing general maintenance tasks and troubleshooting procedures

**AUDIENCE**
IT professionals involved in supporting/deploying simulation clusters with relevant RedHat Linux support and maintenance experience over the last 5 years

**PREREQUISITE**
IT Background with Linux proficiency

### Initializing simulation models using Petrel
**Skill – 3 Hours**

The course focuses on the three main approaches (Equilibration, Enumeration, and restart file) used to define the initial conditions of a reservoir model. End point scaling (EPS) concepts are covered in the course contents. The course to discuss how to honor initial water distributions with J-function and SWATINIT methods. The course recommends best practices including simulation grid QC, an initial stability test and reconciliation between static and dynamic volume calculations.

**COURSE CONTENT**
- Initialization Enumeration
- Equilibration
- Restart
- Fine grid equilibration
- Simulation grid QC
- Stability test
- End point scaling Scaling of saturation end points
- Scaling of end point relative permeabilities and capillary pressures
- Matching initial water saturations J-function
- SWATINIT
- Volumetrics Volume calculation in Petrel
- Volume reporting in ECLIPSE
- Volume reconciliation

**AUDIENCE**
Engineers, geoscientists, stimulation engineers, and asset teams

**PREREQUISITE**
Petroleum engineering, geomechanics, and geology

### ECLIPSE Advanced Topics
**Skill – 5 Days**

The ECLIPSE simulator software suite provides solutions for the entire spectrum of reservoir simulation, offering numerical simulation techniques for all types of reservoirs and all degrees of complexity. If you are an experienced simulation engineer ready to advance your knowledge of ECLIPSE simulator software, this course is structured for you. Because of the wide range of topics available, please specify the subjects of particular interest when registering.

**COURSE CONTENT**
- Initialization and end-point scaling

**AUDIENCE**
Reservoir Engineers involved in reservoir appraisal and field development projects

**PREREQUISITE**
Attendees must have attended ECLIPSE simulation course or Petrel Reservoir Engineering course.

Visit NExTraining.com/classes for the latest calendar or to register for a course.
- Modeling horizontal wells
- Modeling downhole inflow control devices using multisegmented wells
- Well and group controls
- Gas lift optimization
- Amalgamation of surface facilities using reservoir coupling
- Network modeling
- Flux boundary and pressure boundary conditions
- Convergence issues
- Actions and user-defined parameters
- Gas supply contract modeling (optional)
- Refinement and coarsening of local grids (optional)

**AUDIENCE**
Reservoir engineers experienced in working with ECLIPSE simulator software and wanting to learn advanced simulation techniques.

**PREREQUISITE**
ECLIPSE Blackoil Reservoir Simulation course or experience as a simulation engineer, and ECLIPSE Applied Reservoir Simulation Fundamentals course.

### Initializing simulation models using Petrel
**Advanced – 1 Hours**

It is always a good practice to properly set the initial reservoir conditions before simulating the dynamic behavior of the reservoir.

The initialization process determines the presence of the various phases inside the reservoir, both free and dissolved, as well as the pressure variation with depth. They are critical in the surface Fluid-in-Place calculations. The process also takes into account the structure and boundaries of the reservoir, fluid contacts and transition zones.

The webinar focuses on the three main approaches (Equilibration, Enumeration, and restart file) used to define the initial conditions of a reservoir model.

How to set up reservoir initial conditions using Petrel Reservoir Engineering workflow is also covered.

**COURSE CONTENT**
- Initialization Methods
- Enumeration
- Equilibration
- Restart
- Fine grid equilibration
- Simulation grid QC
- Stability test

**AUDIENCE**
Attendees must have attended ECLIPSE simulation course or Petrel Reservoir Engineering course.

### OFM Intermediate Using Gas Operations Examples
**Skill – 2 Days**

This 3-day course extends the work done in the Fundamentals course and introduces two key areas of functionality.

**PREREQUISITE**
OFM knowledge at the fundamentals course level

### Techlog Saturation Height Modelling
**Skill – 2 Days**

In this course, you will learn how to handle, prepare and interpret core and petrophysical data from a wellbore centric perspective. You will learn how to build integrated interpretation workflows to provide input to your static reservoir model. You will import capillary pressure data from core, quality check the core data and perform core data processing. You will then create saturation models using petrophysical properties and refine the saturation model parameters by comparing it to log saturation. The workflow is completed by exporting the refined model for static reservoir modelling.

**COURSE CONTENT**
- Capillary pressure data handling (Data import, QC and processing)
- Generating a capillary pressure model using petrophysical properties for different rock types in a multi pore throat environment
- Optimizing the capillary pressure model in log domain
- Solving for free water level, FWL per hydraulic zone in a multiwell environment

**AUDIENCE**
Reservoir Engineers and Petrophysicists

### OFM Intermediate Using Gas Operations Examples
**Skill – 3 Days**

The training discusses the main features of INTERSECT relative to working with Petrel...
or the ECLIPSE reservoir simulator. Along the way, users will also become acquainted with the basic features of the INTERSECT simulator. The course incorporates information about using Petrel pre- and post-processors as the primary front-end for the INTERSECT simulator.

**COURSE CONTENT**
- Overview of Reservoir Simulation with INTERSECT
- The Petrel RE Workflow
- The Migrator Workflow
- The INTERSECT File Structure
- The INTERSECT Input Format (IXF)
- Field Management Concepts
- Field Management Applications
- Field Management with the Petrel User Interface
- Reports
- Differences Between INTERSECT and ECLIPSE
- Simulator Performance Improvements

**AUDIENCE**
Reservoir engineers working on simulation studies

**PREREQUISITE**
Reservoir engineering.

### Integrated Asset Modeler Fundamentals

**Skill – 5 Days**

This course demonstrates the primary functionalities of IAM for integrated asset modeling studies. It covers coupling model procedures for reservoir to network, network to surface and reservoir, network to economic model including the composition management between models.

**COURSE CONTENT**
- Couple reservoirs to networks
- Run time-based simulations
- Connect models
- Add a Microsoft Excel model to a flow diagram
- Transfer compositions
- Learn key reservoir network coupling fundamentals
- Create Asset Management Strategies
- Perform Optimization studies
- Evaluate economics with Merak Peep models

**AUDIENCE**
Reservoir engineers wanting to learn compositional simulation using the ECLIPSE Compositional simulator.

**PREREQUISITE**
Knowledge of PVT or EOS modeling; reservoir engineering background or familiarity with ECLIPSE Blackoil simulator.

### Petrel Advanced Wells

**Skill – 2 Days**

This course builds on the Petrel Reservoir Engineering course and goes more into depth on modeling of deviated wells. The standard well modeling with the ECLIPSE simulator and the FrontSim module treats the entire wellbore as a single entity; therefore, the model cannot take into account pressure changes along the wellbore due to friction, valves, or pumps. Such devices are often used with horizontal wells to control the inflow profile along the well trace.

To model these effects, a multisegmented well model must be used. This course explains the capabilities of this well model and how to use the Petrel platform to set up the model. Methods for adding completions such as valves and pumps and making development strategies using the equipment are also covered in this course. Sector models can be useful to study portions of a reservoir.

This course shows how to define sectors, select boundary conditions, and run sector models.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

COURSE CONTENT

• Standard well model versus the multisegmented well model
• Pressure drop along horizontal wells
• Designing horizontal wells and wells with laterals
• Setting up multisegmented wells
• Completion design for multisegmented wells
• Development strategies with group control
• Sector models

AUDIENCE

Reservoir engineers or geoscientists with above average experience in the domain.

PREREQUISITE

Petrel Fundamentals and Petrel Reservoir Engineering or equivalent experience.

OFM Intermediate Using Gas Operations Examples

Skill – 2 Days

This 3-day course extends the work done in the Fundamentals course and introduces two key areas of functionality.

• Forecasting offers a highly interactive module for the user to history match and subsequently forecast production. The widely used Arps technique is covered, and forecasts will be created using a variety of assumptions. In addition to single-phase (oil, gas) forecasts, the course covers ratio forecasts and additional techniques such as calculated forecasts, together with how to make effective use of the results.

• Mapping introduces a wide variety of map-based visualizations, including bubble, grid, contour, scatter, and surface maps.

COURSE CONTENT

• Introducing PVT by various methods
• Creating waterflood patterns
• Mapper applications bubble map
• Grid and contour maps
• Surface maps
• Scatter plots
• Forecasting history match techniques
• Forecast scenarios
• Forecast cases
• Ratio forecasts
• Calculated forecasts
• Forecast reports

AUDIENCE

Development geoscientists, development reservoir engineers, production engineers

PREREQUISITE

OFM knowledge at the fundamentals course level

Chemical Methods for Enhanced Oil Recovery with ECLIPSE

Skill – 3 Days

When using CEOR, chemicals such as surfactants, alkaline solutions, and polymers are added to the displacing water. This changes the physicochemical properties of the water and the contacted oil, making the displacement process more effective. The three main approaches are the use of surfactants, alkaline, and polymers.

In surfactant flooding, the interfacial tension between the oil and the displacing water, and the interfacial tension between the oil and the rock interfaces are reduced so that residual oil can be displaced and recovered.

COURSE CONTENT

• Enhanced Oil Recovery fundamentals
• Improved oil recovery versus enhanced oil recovery
• Chemical EOR processes
• Screening criteria for chemical EOR processes
• Surfactant flooding
• General information on surfactants
• Surfactant-brine-oil phase behavior
• Capillary number
• Foam flooding
• General information on foam
• Flow of foams in porous media
• Foam model in ECLIPSE

AUDIENCE

Reservoir and simulation engineers working on enhanced oil recovery studies

PREREQUISITE

Reservoir Engineering background with good knowledge in using ECLIPSE
Petrel Uncertainty Analysis and Assisted History Matching

Skill – 2 Days

This course builds on the Petrel Reservoir Engineering course and focuses on how to use Petrel to assist in the history matching process and also for sensitivity and uncertainty studies. This involves how to run the simulations as well as how to use the tools that Petrel offers for results viewing including histograms, tornado plots, spreadsheets, and line vectors.

COURSE CONTENT
- Subsurface Uncertainty Analysis
- Introduction to History Matching
- Basic Statistics
- Uncertainty Analysis
- Workflow Creation and Modification
- Handling of Tabular Variables
- Assisted History Matching

AUDIENCE
Development and exploration petroleum engineers, reservoir engineers, geoscientists, and any asset team members who want to get acquainted to Petrel reservoir engineering workflow.

PREREQUISITE
Petrel Reservoir Engineering course or equivalent Petrel experience.

Petrel Reservoir Geomechanics

Skill – 2 Days

This course introduces reservoir engineers and consultants to some basic concepts in geomechanics and the Petrel platform product. Attendees will learn how to incorporate data about geomechanical effects into reservoir models of well production behavior.

In addition to introducing geomechanics concepts, this course presents the types of data used for geomechanical modeling in the petroleum industry, and some of the geomechanical effects observed in oil and gas reservoirs and the subsurface during hydrocarbon production. The course also includes how to build reservoir models that show geomechanical effects such as pressure, stress, and strain, as well as data on reservoir flow, illustrating the effects over time, and how to build reservoir geomechanical models using the Petrel platform.

COURSE CONTENT
- Fundamentals of geomechanics
- Petroleum geomechanics and reservoir geomechanics
- The use of Petrel platform geomechanics software

AUDIENCE
Reservoir engineers and geotechnical consultants.

PREREQUISITE
Petrel platform and ECLIPSE simulator software.

Petrel Reservoir Engineering

Skill – 5 Days

This course enables attendees to prepare and run a Petrel platform model for reservoir simulation in ECLIPSE, ECLIPSE FrontSim, and INTERSECT simulator software. In this course, attendees will build a 3D simulation model inside the Petrel platform based on a geological input data, add wells and well control rules, create black oil fluid models and rock physics functions, and submit the model to the simulators. In addition, practical application of most Petrel platform simulation processes will be discussed and illustrated in the exercises. Overall, pre-processing and post-processing of simulation data will be done within the Petrel platform environment.

COURSE CONTENT
- Simulation case setup
- Initialization and volume calculation
- Simulation run and results viewing
- History matching and prediction
- Well engineering
- Upscaling and advanced corner point gridding

AUDIENCE
Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in Petrel platform software.

PREREQUISITE
Petrel Fundamentals course or equivalent Petrel experience, and general knowledge of reservoir engineering or petroleum geology and geophysics.

Petrel Well Design

Skill – 3 Days

The purpose of this course is to introduce the well design module and the drilling functionalities in the Petrel platform. The attendees are guided through the preparation stage for data used in offset well analysis, which includes loading of drilling events, drilling logs, and using end of well reports to filter the knowledge database by, for example, data type, category, or event severity. Attendees will become familiar with the available well design approaches, including an enhanced method also used by drilling engineers How to import trajectory and targets from third-party applications such as the Landmark EDM will also be introduced. After the planning phase, attendees will learn how real-time data acquisitions are handled in the Petrel platform.

COURSE CONTENT
- Drilling event classification and visualization
- Webmap services
- Well design
- Well path design
- Real-time data acquisition

AUDIENCE
Drilling engineers, geologists, and petrotechnical personnel with fundamental knowledge in Petrel platform software and who need to understand well path design and optimization within the Petrel platform.

PREREQUISITE
Petrel Fundamentals course.

Petrel Workflow Editor and Uncertainty Analysis

Skill – 2 Days

This course builds on the Petrel Reservoir Engineering course and focuses on how to use Petrel to assist in the history matching process and also for sensitivity and uncertainty studies. This involves how to run the simulations as well as how to use the tools that Petrel offers for results viewing including histograms, tornado plots, spreadsheets, and line vectors.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

COURSE CONTENT

- Workflow Editor interface and logic
- Running predefined workflows
- Creating user defined workflows
- Updating 3D models with new input data
- Get familiar with the Uncertainty and optimization process Sensitivity and uncertainty analysis setup
- Structural uncertainty
- Fluid contact uncertainty
- Property uncertainty

AUDIENCE

Development and exploration geologists, geophysicists, petroleum engineers, managers, and technical personnel with good experience in Petrel.

PREREQUISITE

Petrel Fundamentals or equivalent experience in Petrel. General good knowledge in the geology, geophysics domain.

Petrel Production Data Interpretation and Forecasting

Skill – 3 Days

This course is based on Petrel 2014.3, it provides a comprehensive overview of Petrel as a tool for production interpretation and forecasting. It encompasses stream-lined workflows ranging from production diagnostics using specialized plots to Rate Transient Analysis (RTA) and production forecasting with analytical simulation. The RTA methods in Petrel places emphasis on fracture characterization. The workflow includes quick parameter estimation using “line-fits” as well as more advanced non-linear regression.

COURSE CONTENT

- Production forecasting with analytical simulation
- Rate Transient Analysis - RTA
- Production diagnostics with pressure transient plot and rate transient plot
- Field case studies and exercise

AUDIENCE

Reservoir engineer, production engineer, completions engineer and stimulation engineer with interested in learning well performance analysis and production optimization using Petrel.

PREREQUISITE

Petrel fundamentals course or similar Petrel experience

Techlog Fundamentals

Skill – 3 Days

The Techlog platform interactive suite brings all of the petrophysical and geological data together. Attendees will learn the fundamentals of this application and its Techplot, Techdata, and Quanti base modules. In addition, the use of the data model within the Techlog application and the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images will be explained. The course topics include deterministic calculations and the principles behind the application workflow interface for single- and multwell use.

COURSE CONTENT

- Techlog platform interface and data structure
- Data management and QC techniques
• Well engineering
• Upscaling and advanced corner point gridding

AUDIENCE
Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in Petrel platform software.

PREREQUISITE
Petrel Fundamentals course or equivalent Petrel experience, and general knowledge of reservoir engineering or petroleum geology and geophysics.

OFM Fundamentals Using Oil and Waterflood Production Examples

Foundation – 2 Days

This course introduces the attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared oil and waterflood production project. The course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in the OFM software suite. The course covers each of the required tasks. In accomplishing the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters. The course also covers graphical display features ranging from tabular plots through line graphs to GIS map-based representations.

COURSE CONTENT
• A brief walkthrough of a fully functioning project
• Review project data and check for missing values
• Use filters to screen out unwanted entities for analysis
• Group project data at multiple levels
• Create calculated fields and calculated variables
• Create single- and multiple-well plots
• Create and format well and field summary reports
• Export reports and table data to other applications

AUDIENCE
Anyone responsible for setting up and maintaining a project using OFM software.

PREREQUISITE
None

MEPO Introduction

Foundation – 3 Days

This course is designed to introduce the application of MEPO to reservoir engineers and asset teams involved with related disciplines. The course will cover workflow processes for several concrete application scenarios using industry standard design and optimization techniques in reservoir simulation. Following an introduction to the basic functionality of the tool and project structure, the course attendees will be given a brief summary of terminology and concepts in uncertainty modeling, assisted history-matching, and production forecasting, followed by presentation and hands-on experience gained by working with the application of MEPO. Practical exercises include performing uncertainty analyses as well as investigating the influence of various parameters on reservoir modeling and alternative development strategies. The remainder of the course is dedicated to principles and practice of MEPO with a focus on history – matching tasks and uncertainty quantification. Significant emphasis will be placed on design, execution, and postprocessing of reservoir simulation runs. Using carefully selected example cases and exercises, the attendees will gain an understanding of methods and modeling techniques that will enable them to make use of MEPO in their routine tasks.

COURSE CONTENT
• Introduction to MEPO
• Introduction to dynamic uncertainty quantification
• Experimental designs
• Analyzing features
• Introduction to optimization methods for history matching and reservoir optimization
• General understanding on the use of MEPO
• Workflow examples and best practice

AUDIENCE
Reservoir engineers.

PREREQUISITE
None

PIPESIM Fundamentals

Foundation – 2 Days

In this course, attendees explore the PIPESIM flow simulator, which provides steady-state, multiphase flow simulation for oil and gas production systems. Individual PIPESIM modules are used for a wide range of analyses, including well modeling, nodal analysis, field planning, artificial lift optimization, and pipeline and process facilities modeling. A major feature of PIPESIM simulator software is the system integration and openness that allows users to develop a Total Production System Model. The attendees will gain a general understanding of how PIPESIM simulator software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

COURSE CONTENT
• Analyze well performance
• Design of models for pipeline and process facilities
• Perform nodal analysis
• Develop black-oil and compositional fluid models
• Select multiphase flow correlations
• Surface network models

AUDIENCE
Anyone wanting to learn steady-state, multiphase flow simulation for oil and gas production systems to analyze well performance, model pipelines and facilities, and perform nodal analysis using PIPESIM simulator software.

PREREQUISITE
None

ECLIPSE Blackoil Reservoir Simulation

Foundation – 5 Days

The focus of this course is on learning the ECLIPSE Blackoil reservoir simulator software, rather than simulation methodology. This fully implicit, three-phase, 3D, general-purpose black-oil simulator includes several advanced features of ECLIPSE simulator software.

COURSE CONTENT
• Overview of how a simulator initializes and executes
• Block-centered and corner-point grid geometries
• Rock and fluid properties
• Allocation of initial pressure and saturation distribution
• Aquifer definition
• Control wells under history-matching and production regime
• ECLIPSE Blackoil simulator file structure
• Input rules
• Specifying and editing input and output data
• Building and executing a simulation model
• Analysis of results through postprocessing

AUDIENCE
Reservoir engineers, geoscientists, and other technically trained individuals interested in learning the ECLIPSE Blackoil simulator.

PREREQUISITE
ECLIPSE Applied Reservoir Simulation Fundamentals course and background in reservoir engineering.

COURSE CONTENT
• A brief walkthrough of a fully functioning project
• Review project data and check for missing values
• Use filters to screen out unwanted entities for analysis
• Group project data at multiple levels
• Create calculated fields and calculated variables
• Create single- and multiple-well plots
• Create and format well and field summary reports
• Export reports and table data to other applications

AUDIENCE
Anyone responsible for setting up and maintaining a project using OFM software.

PREREQUISITE
None

FrontSim Streamline Reservoir Simulation

Foundation – 5 Days

The ECLIPSE FrontSim streamline black oil simulator is a three-phase, 3D simulator that models multiphase fluid flow along streamlines. Attendees will learn how to visualize the dominant flow paths and depict fluid flow behavior within complex geology, then transfer this knowledge into ECLIPSE simulator applications. This course emphasizes the use of the software rather than the methodology of simulation studies.

COURSE CONTENT
• ECLIPSE FrontSim simulator fundamentals
• Front-tracking and tracer simulation
• Compressibility and changing streamlines
• Finite-difference and saturation solvers
• Gravity and segregation
• Pressures grids and velocity fields
• Fluids, rocks, and model initialization
• End-point scaling
• 3-phase black-oil models
• Aquifers, wells, and history matching
• Forecasts and waterflood optimization

AUDIENCE
Reservoir engineers, geoscientists, and technically trained individuals interested in learning reservoir simulation using the ECLIPSE FrontSim simulator.

PREREQUISITE
Reservoir engineering background and ECLIPSE Applied Reservoir Simulation Fundamentals course.

Petrel Fundamentals

Awareness – 2 Days

The course covers basic usage of the application, providing an understanding of how to get started with Petrel. You will learn about Petrel project set-up, data import, visualization, creating simple surfaces and grids and performing basic quality checks. You will also be introduced to the Studio Database and simple tools for retrieving data.
COURSE CONTENT
- Petrel basics and interface
- Retrieve and prepare your data
- Visualization and QC
- Seismic Reconnaissance
- Make surfaces
- Make simple grid
- Geometrical modeling
- Plotting

AUDIENCE
Development and Exploration Geologists, Geophysicists, Geoscientists, Petroleum Engineers, Managers, and Technical IT personnel with no prior experience in Petrel software.

PREREQUISITE
We recommend that users with no prior experience in Petrel complete the Petrel Fundamentals course before taking the Petrel Reservoir Engineering, Petrel Geology, Petrel Geophysics, Petrel Drilling or Petrel Data Management courses.

COURSE CONTENT
- Explore the Techlog interface and data structure
- Learn data management and quality control techniques
- Implement multiwell management
- Use basic plotting tools
- Create workflows for deterministic evaluation using Quanti

AUDIENCE
Development and exploration log analysts and petrophysicists, geologists, petroleum engineers, managers, and technical personnel with no prior experience using Techlog platform software.

PREREQUISITE
None

COURSE CONTENT
- Simulation software products and installation
- Naming conventions and release procedures
- Operating systems and certified systems
- Parallel simulation and benchmarks
- Multiple realization workflows
- ECLRUN batch schedulers and licensing
- EnginFrame

AUDIENCE
Reservoir, petroleum, and system engineers and anyone involved in running simulation in parallel

PREREQUISITE
Basic reservoir engineering concepts

COURSE CONTENT
- Fractured reservoir fundamentals
- Well testing in fractured reservoirs

Visit NExTTraining.com/classes for the latest calendar or to register for a course.
**History Matching and Reservoir Optimization**

**Advanced – 5 Days**

Production data are incorporated into high-resolution reservoir models through conventional and fast flow simulation techniques such as streamline models. In this course, attendees will learn different history-matching workflows and their merits, including assisted and automatic history matching, in addition to exploring the many forms of production data, pressure transient test, tracer test, multiphase production history, and interpreted 4D seismic information. Field examples illustrate the advantages and limitations of these techniques.

**COURSE CONTENT**

- History matching: broad perspectives and current status
- History-matching workflows
- Production data integration: background and theory
- Flow simulation through geologic models: streamline approach
- Streamline-based production data integration
- Assisted history matching and inverse modeling with finite-difference models
- History matching: field applications
- Experimental design: background and applications
- Recent developments in history matching: ensemble Kalman filter and Markov chain Monte Carlo

**AUDIENCE**

Practicing geoscientists and engineers, especially those involved in reservoir simulation.

**PREREQUISITE**

Knowledge of basic mathematics, petroleum geology, reservoir engineering, and petrophysics, plus elemental software skills.

**Formation Testing: Wireline and LWD**

**Skill – 5 Days**

This 5-day course consists of theoretical and practical classroom sessions with the last day devoted to wireline, LWD and PVT laboratory visits to observe formation testing (FT) tools and PVT laboratory facilities and experiments. Presentations on the tools, operations, and the latest interpretation methods are also a part of this course. The attendees will also have various practical exposure sessions with real data and InSitu Pro* real-time quality control and interpretation software (each participant should bring his own Windows based PC). This course consists of 50% classroom and 50% practical with exercises and laboratory visits.

**COURSE CONTENT**

- FT applications
- Pressure surveys and gradient analysis
- Sampling and downhole fluid analysis
- FT pressure transients in-situ stress testing

**AUDIENCE**

Reservoir engineers, geoscientists, operations geologists, and well log witnesses with little or no prior knowledge of formation testing services.

**PREREQUISITE**

Familiar with basics of reservoir engineering and formation evaluation concepts.

**Reservoir Geomechanics with Petrel**

**Skill – 5 Days**

This course covers the necessary fundamentals of reservoir geomechanics in a 3D environment; the origin of stresses in the subsurface and how in situ stresses could be understood using wellbore data, seismic and geological interpretations. Using the Finite Element Method, computed stresses and deformations could be calibrated against measurements, but moreover, changes in the in-situ stress state could be computed due to changes in reservoir pressures along with their impact on reservoir performance; mechanical properties such as rock strength, deformability and pore collapse, how they can be measured in the laboratory and translated into numerical modeling.

**COURSE CONTENT**

- Fundamentals of reservoir geomechanics
- Reservoir geomechanics processes and introduction to PetrelRG

**Audience**

Development and exploration geologists, geophysicists, petroleum engineers, and petrophysicists, production engineers, completion engineers, reservoir engineers, and asset managers concerned with reservoir management, gas and/or water injection, EOR, HPHT field management and long-term reservoir forecasting.

**PREREQUISITE**

None
managers, reservoir engineers, and technical personnel with prior experience in Petrel platform software.

**PREREQUISITE**
Petrel Fundamentals course or equivalent Petrel experience, and general knowledge of reservoir engineering or petroleum geology and geophysics.

<table>
<thead>
<tr>
<th>ECLIPSE Blackoil Reservoir Simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation – 5 Days</strong></td>
</tr>
</tbody>
</table>

The focus of this course is on learning the ECLIPSE Blackoil reservoir simulator software, rather than simulation methodology. This fully implicit, three-phase, 3D, general-purpose black-oil simulator includes several advanced features of ECLIPSE simulator software.

**COURSE CONTENT**
- Overview of how a simulator initializes and executes
- Block-centered and corner-point grid geometries
- Rock and fluid properties
- Allocation of initial pressure and saturation distribution
- Aquifer definition
- Control wells under history-matching and production regime
- ECLIPSE Blackoil simulator file structure
- Input rules
- Specifying and editing input and output data
- Building and executing a simulation model
- Analysis of results through postprocessing

**AUDIENCE**
Reservoir engineers, geoscientists, and other technically trained individuals interested in learning the ECLIPSE Blackoil simulator.

**PREREQUISITE**
ECLIPSE Applied Reservoir Simulation Fundamentals course and background in reservoir engineering.

<table>
<thead>
<tr>
<th>Practical Reservoir Engineering with Petrel and ECLIPSE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation – 5 Days</strong></td>
</tr>
</tbody>
</table>

Introduction to Reservoir Engineering covers the fundamentals, with a primary focus on understanding fluid flow in porous media. Participants will learn reservoir engineering based on the application of analytical techniques. During the first 3 days key reservoir engineering concepts such as reservoir drive mechanisms, volumetrics, petroleum fluid properties and recovery factors will be introduced as tools.

**COURSE CONTENT**
- Fundamentals & Darcy’s Law
- Reservoir engineering overview
- Fundamentals of reservoir phase behavior
- Darcy’s Law and fundamentals of fluid flow
- Reservoir Rock Properties
- Fluid statics and fluid distribution
- Reservoir drive mechanisms

<table>
<thead>
<tr>
<th>Well and Group Control techniques in Reservoir Simulation using Petrel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advanced – 4 Hour</strong></td>
</tr>
</tbody>
</table>

This training course focuses on the different available techniques to control well and group production in the flow simulation using Petrel Reservoir Engineering workflow tools. Lastly, a discussion on injection strategies: the available methods (reinjection, voidage replacement, region pressure control), and how they can be combined to achieve effective pressure maintenance under the injection of both gas and water phases. This training course focuses on the different available techniques to control well and group production in the flow simulation using Petrel Reservoir Engineering workflow tools.

**COURSE CONTENT**
- Well Controls
- Well targets and limits
- Economic limits
- Group Production Strategies
- Guide Rate strategy
- Prioritization strategy
- Workovers and interventions
- Common workovers
- Drilling queues
- Group injection strategies
- Control techniques (reinjection, voidage replacement, region pressure control)
- Achieving effective pressure maintenance

**AUDIENCE**
Reservoir Engineers involved in reservoir appraisal and field development projects

**PREREQUISITE**
Attendees should have attended ECLIPSE simulation course or Petrel Reservoir Engineering course.
Petrel Fracture Modeling: Discrete Fracture Network Construction  

**Skill – 2 Hour**  

The purpose of this course is the successful construction of a Discrete Fracture Network in Petrel, followed by the calculation of fracture porosity, permeability, and connectivity properties that can be used for a dual-porosity simulation. It additionally covers best practices, such as the creation and utilization of fracture drivers, to lower uncertainties of the model away from the wellbore. This is the second and final webinar in the Petrel Fracture modeling series.

**COURSE CONTENT**  
- Fracture modeling introduction  
- Fracture drivers  
- Building a DFN in Petrel  
- Generating fracture properties  
- Live demonstration  

**AUDIENCE**  
Geologists and geophysicists working in naturally fracture reservoirs, Reservoir engineers wanting to understand how fracture properties are constructed

**PREREQUISITE**  
Petrel Fundamentals, Petrel Geology, Geophysics, and Structural Modeling recommended and Petrel 2015 Fracture Modeling: Data Preparation Webinar

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**Introduction to EOR**  

**Foundation – 2 Days**  

This course presents a basic knowledge of chemical, miscible and thermal EOR processes. The general screening criteria for these methods will be discussed via hands on exercises for different example fields. The concepts, limitations, and challenges and fundamental science and engineering behind these EOR processes will also be discussed.

**COURSE CONTENT**  
- EOR Overview  
  - Definition  
  - Generic EOR workflow  
  - Main EOR types and related recovery mechanisms  
- EOR Processes  
  - Concepts  
  - Limitations and challenges  
- EOR Selection  
  - EOR Screening Criteria for all EOR types  
  - Class Exercises illustrating EOR Screening for candidate fields  
- Fundamental science and engineering behind EOR applications  
- Fundamentals of Chemical EOR  
- Fundamentals of Miscible EOR  
- Fundamentals of Thermal EOR and newly developed Thermal methods  

**AUDIENCE**  
Attendees must have attended ECLIPSE simulation course or Petrel Reservoir Engineering course.

**PREREQUISITE**  
Reservoir Engineers involved in the reservoir appraisal and field development projects

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**Reservoir Engineering for Non-Reservoir Engineers (Virtual instructor)**  

**Foundation – 12 Hour**  

This course is designed to cover basics of reservoir engineering and its integration with other subsurface disciplines by discussing the basics of fluid flow in porous media, petroleum fluid properties, reservoir drive mechanisms, recovery factors, reserves estimation including volumetric, material balance and decline curve analysis. Principles of other reservoir engineering applications like well testing, is also covered.

**COURSE CONTENT**  
- Role of reservoir engineers  
- Reservoir fluids phase behavior  
- Fundamentals of fluid flow in porous media  
- Volumetric reserve estimates  
- Reservoir drive mechanisms  
- Displacement concepts  
- Principles of decline curve analysis  
- Material balance concepts  
- Principle of well testing  

**AUDIENCE**  
This course is designed for those individuals whose background is not reservoir engineering.

**PREREQUISITE**  
A technical degree
Drilling Engineering

NExT's curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>DOMAIN</th>
<th>SOFTWARE</th>
<th>VIRTUAL CLASSROOM</th>
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</thead>
<tbody>
<tr>
<td>ADVANCED</td>
<td>Well Planning &amp; Design</td>
<td>Drilling Technology</td>
<td>Management &amp; Well Operations</td>
</tr>
<tr>
<td></td>
<td>Advanced Petroleum Geomechanics</td>
<td>Dynamic Pressure Drilling</td>
<td>IWCF Surface Well Control Certification (Supervisors) Level-4</td>
</tr>
<tr>
<td></td>
<td>HPHT Drilling Design and Operations</td>
<td>HPHT Well Engineering</td>
<td>IWCF Well Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training</td>
</tr>
<tr>
<td>SKILL</td>
<td>Well Abandonment - Plug, Abandonment and Decommissioning SE Advanced Topics</td>
<td>Practical Directional Drilling and Surveying</td>
<td>Practical Real Time Operations for Well Construction with InterACT and Petrel</td>
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<td>Cement Integrity Assurance and Evaluation</td>
<td>Horizontal, Extended Reach, and Multilateral Drilling</td>
<td>Stuck Pipe Prevention</td>
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<td>Drilling and Surveying</td>
<td>Mud School - European Learning Center</td>
<td>Mud Logging: Surface Gas Measurement and Fluid Characterization</td>
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<td>Cementing Operations</td>
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<td>Deepwater Drilling Design and Operations</td>
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<td>Deepwater Well Project and Risk Management</td>
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<td>Practical Cementing Operations</td>
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<td>Stuck Pipe and Fishing Operations</td>
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<td>Well Architecture and Drilling in Shale Plays</td>
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<td>Stuck Pipe and Hole Cleaning</td>
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<td>Advanced Remedial Cementing (Russian)</td>
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<td>Practical Real Time Operations for Well Construction with InterACT and Petrel</td>
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<td>FOUNDATION</td>
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<td>Well Placement Fundamentals</td>
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<td>Fundamentals of Cementing Operations</td>
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<td>Basic Cementing (Russian)</td>
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<td>Mud Logging Operations</td>
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<td>Introduction to Drilling</td>
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Drilling Engineering

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked with "●" while technical courses that use software have been marked with "✓", and the courses with practical sessions (either hands-on operational or software or both) are highlighted with "◆". There are some courses that use simulators and are highlighted with "★".

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<th>DOMAIN</th>
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<td>Petrel Well Design</td>
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<td>Petrel Reservoir Geomechanics</td>
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<td>Drillbench Dynamic Hydraulics and Temperature Modeling</td>
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<td>Wellflo Underbalanced Hydraulics Modeling</td>
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<td>Stuck Pipe and Hole Cleaning - Virtual Seminar</td>
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<td>Deepwater Design and Operations Familiarisation (Virtual instructor)</td>
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**COMPETENCY LEVEL**
- **SKILL**
- **FOUNDATION**
Advanced Petroleum Geomechanics

Advanced – 5 Days

This course builds on the NExT Fundamentals of Petroleum Geomechanics course and starts to investigate geomechanics beyond simple elastic, isotropic behaviour. After a brief review of fundamental concepts, earth stresses and the Mechanical Earth Model, the course looks at the impact of reversible and non-reversible geomechanical behaviour on drilling, stimulation, sand production and injection looking specifically at thermal, depletion and compaction effects. The course then investigates anisotropy, its nature and effect on geomechanics, and its significance and influence on well construction and field development. The course also covers salt, introducing the mechanics of salt, short term and long term behaviour, as well as the impact on drilling both sub-salt and pre-salt.

COURSE CONTENT

• Introductions and the business of petroleum geomechanics
• Review of fundamentals
• Mechanical Earth Model
• Anisotropy
• Fundamentals
• Mechanical properties
• Wellbore applications
• Effects on stress
• Laboratory measurements
• Reservoir geomechanics
• Compaction
• Thermal
• Depletion effects
• Well integrity
• Plasticity
• Salt
• Mechanics
• Stress
• Wellbore stability
• Drilling topics
• Bits
• Fluids
• Lost circulation
• Leakoff tests
• Wellbore strengthening
• Sonic logging and other measurements for geomechanics
• Fractures, faults and earthquakes
• Summary and wrap-up

AUDIENCE
Geologists, geophysicists, geomechanics engineers, drilling engineers, production engineers, completion engineers, reservoir engineers, exploration supervisors and managers concerned with the geomechanics challenges of field development.

PREREQUISITE
Completion of Fundamentals of Petroleum Geomechanics or a strong understanding of Geomechanics fundamentals is recommended.

Dynamic Pressure Drilling

Advanced – 5 Days

This course teaches attendees the principles of dynamic pressure drilling, including how and where to apply these drilling methods. The attendees will learn how to select the optimal equipment, controls, and drilling fluids needed for effective drilling in underbalanced and managed pressure drilling scenarios.

COURSE CONTENT

• Dynamic pressure drilling overview, applications, and techniques
• Geologic issues
• Drilling fluid selection, including underbalanced and two-phase flow considerations
• Drilling equipment selection for managed and underbalanced pressure conditions and use
• Rotating control devices (RCDs) and seal elements
• Designing for managed and underbalanced pressure conditions
• Dynamic drilling methods for offshore, including tripping methods
• Candidate selection
• Economics of dynamic pressure drilling
• Management and HSE considerations

AUDIENCE
Drilling professionals embarking on a dynamic pressure drilling assessment.

PREREQUISITE
Fundamental understanding of basic drilling technology.

IWCF Surface Well Control Certification

Advanced – 5 Days

This course is designed to fulfill the requirements for International Well Control Forum (IWCF) surface well control qualification. It is assumed that attendees taking this course fulfill the prerequisite requirements. The course is aimed at those individuals in well-control critical positions. Course content will be taught according to the IWCF syllabus and will prepare candidates for the IWCF examinations and assessment. The assessment consists of practical assessment using simulator equipment (type of simulator dependent on location of training), principles and procedures (P&P) written examination, surface well-control equipment written examination, and IWCF certificates that are valid for 2 years.

COURSE CONTENT

• Fundamental principles
• Kick causes and kick indicators
• Well-control preparation and preventative measures
• Shut-in procedures and gas migration
• Driller’s, and Wait and Weight methods
• Volumetric and lubricate and bleed methods
• Well-control complications in deviated wells
• Diverter and accumulator system
• Pressure tests and choke manifold
• Flanges, ring gaskets, and BOPs
• Inside of BOPs and mud-gas separator

AUDIENCE
Geologists, geophysicists, geomechanics engineers, drilling engineers, production engineers, completion engineers, reservoir engineers, exploration supervisors and managers concerned with the geomechanics challenges of field development.

PREREQUISITE
Completion of Fundamentals of Petroleum Geomechanics or a strong understanding of Geomechanics fundamentals is recommended.
AUDIENCE
Rigsite personnel in critical well control positions and office-based engineers/supervisors who require IWCF certification.

PREREQUISITE
Oilfield math, knowledge of rigsite well-control systems, and either 1 to 2 years of rig experience, or one (or more) of the following: IWCF Distance Learning (Modules 1, 2, 3), IWCF Introductory Well Control NExT Well Control Overview.

HPHT Drilling Design and Operations
Advanced – 5 Days

This course has been designed to help drilling engineering professionals understand the technologies, terminology, challenges, concepts, processes, and equipment used to drill High Pressure and High Temperature oil and gas wells. The course follows a typical HPHT operation and provides an understanding of the geological settings through well planning, drilling operations and well control challenges to the completion challenges in HPHT wells. Critical HPHT challenges are addressed in detail during the course. Some of the solutions such as managed pressure drilling are addressed with a focus on the issues that are being solved.

COURSE CONTENT
- HPHT History and Challenges and the Geological Settings
- Defining the HPHT Environment
- HPHT Challenges and associated Standards and Practices
- Geology in the HPHT Environment
- HPHT Reservoirs
- Well Design
- Casing Design and Tubular Selection
- Shoe Placement
- Annular Pressure build up and Thermal De-rating
- Casing Wear, H2S and CO2 Effects
- Cementing Challenges and Practices
- Fluids and Well Control
- Drilling Fluid Aspects
- Gas Solubility
- Elastomers
- Well Control, Ballooning, Wellbore Breathing
- Gas Expansion
- Well Control Procedures
- Rig Surface Equipment and Drilling Operations
- Surface Equipment for HPHT
- Downhole Equipment Challenges
- Managed Pressure Drilling
- Finger Printing and Drilling Practices
- Contingency Planning
- Well Control Emergencies
- Completions and Well Testing
- HPHT Completions
- Design Considerations

- Component Selection and Specifications
- Tubing Leak Contingencies
- HPHT Well testing
- Operational Testing Considerations
- Well testing Safety

AUDIENCE
Drilling professionals with well design and operations experience desiring an understanding of the challenges faced in the HPHT drilling environment.

PREREQUISITE
Participants must have a comprehension and understanding of well design, well construction operations, and management which will be necessary to grasp the concepts and challenges faced in the High Pressure and High Temperature environments.

IWCF Well Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training
Advanced – 4 Days

This course is designed to fulfill the requirements for International Well Control Forum (IWCF) Well Intervention Pressure Control Qualification. It is assumed that the individual attending this course fulfills the prerequisite requirements of this course. The program is aimed at persons in pressure control critical positions. Candidates are required to complete the IWCF accredited training course prior to sitting assessment. Course content will be taught according to the IWCF Well Intervention syllabus and will prepare candidates for the IWCF examinations and assessment.

COURSE CONTENT
- Introduction
- WCF Registration
- Course orientation & Initial Assessment (written examination)
- Equipment#1 – Completion Equipment
- Class Exercise#1 – Completion Equipment
- P&P#1 – Pressure Control Management
- Class Exercise#2 – Pressure Control Management
- P&P#2 – Barrier Principles
- P&P#3 – Well Information
- P&P#4 – Shut-in Procedures
- P&P#5 – Pressure Control Methods
- P&P#6 – Problems
- Class Exercise#3 – Barrier Principles, Well Information, Shut-in Procedures, Pressure Control Methods and Problems
- Equipment#2 – Wireline Equipment
- Class Exercise#4 – Wireline Equipment
- Equipment#3 – Coiled Tubing Equipment
- Class Exercise#5 – Coiled Tubing Equipment
- Equipment#4 – Hydraulic Workover (Snubbing) Equipment
- Class Exercise#6 – Hydraulic Workover (Snubbing) Equipment
- WCF Assessment – Completion Equipment
**IMMERSIVE LEARNING PROGRAMS**

- IWC Assessment – Principles & Procedures
- IWC Assessment – Wireline Equipment
- IWC Assessment – Coiled Tubing Equipment
- IWC Assessment – Hydraulic Workover (Snubbing) Equipment
- IWC Assessment Re-sit (as required)

**Well Abandonment - Plug, Abandonment and Decommissioning**

**Skill – 5 Days**

This course presents wellbore plug and abandonment (P&A) and well decommissioning concepts, including why and how wells are temporarily suspended and permanently removed from service. Participants learn about basic principles of well integrity, well barrier element (WBE) installation, and WBE verification and acceptance criteria. In addition to Oil and Gas industry guidelines and standards, legislation by various countries, including resulting laws and governmental regulations, are reviewed.

**COURSE CONTENT**

- Intro to P&A: The Next Five Years—Drivers; Challenges; Services and Technologies; Activity Levels and Costs
- Well Integrity and Well Control; Drilling and Primary Cementing; Well Barrier Elements—Casing and Cement
- Primary Cementing; Criteria for Successful Cementing; Cement Evaluation; Types of Well Completions
- Generic Well-Abandonment Overview and Review; Intro to Well-Abandonment Regulations and Guidelines
- Gas Migration: Consequences, Causes and Control; Cement as a Well Barrier Element (WBE)
- Perforating; Casing Cutters—Explosive, Chemical and Mechanical; Fishing Tools and Fishing Operations
- Technology-Center Visit: Smith Technology Center—Rankin Road, Houston, Texas (or similar facility if not in Houston); Bit manufacturing plant; IDEAS integrated dynamic engineering analysis system lab; Drilling Tools & Remedial manufacturing plant
- P&A Technologies: Section Mills; Pipe Cutters; and Single-Trip Cutting, Milling and Under-reaming systems
- Best Practices: Example P&A Exercise
- Cement and Casing Evaluation Techniques: Caliper, Temperature, Tracer, Noise and Production Logging; Cement Bond/Variable Density Log (CBL/VDL), UltraSonic Imager Tool (USIT), Isolation Scanner Tool (IST)
- Squeeze Cementing; Cement Plug Placement; and Specialty Cements ... (250+ slides)
- Laboratory Visit: Houston Cementing Technology Center (CTC)—Cementing Client Support Lab (CSL) (or similar facility if not in Houston)
- Best Practices: Example P&A Exercise
- Well-Abandonment Legislation, Regulations and Guidelines; Comparison of P&A Requirements.
- Best Practices: Example P&A Exercise

**AUDIENCE**

Government Regulators; Drilling and Completion Engineers and Technicians; Superintendents, Wellsite Supervisors, and Inspectors. Any person who designs, plans or manages well drilling, wellbore completion and field operations activities will benefit from this course.

**PREREQUISITE**

General math and science skills; Basic to intermediate understanding of oil-and-gas well drilling and cementing operations; wellbore casing and tubular components; well-completion design and installation.

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**Practical Directional Drilling and Surveying**

**Skill – 5 Days**

This course enables attendees to understand the operations performed by directional drillers and their contributions to the design of directional and horizontal wells. The course, which covers the fundamentals, design considerations, and operational aspects of directional and horizontal drilling, is conducted at the Schlumberger Stonehouse Technology Center (SHTC), and the Schlumberger Drilling Center of Excellence. Numerous visits, workshops, and practical exercises at SHTC will complement and illustrate the theoretical knowledge taught in class.

**COURSE CONTENT**

- Surveying
- Error models and the role of the Industry Steering Committee on Wellbore Survey Accuracy (ISCWSA)
- Survey corrections
- Anticollision
- Directional Calculations
- Steering the well
- Drilling design
- Geomechanics
- Wellbore stability issues
- Hole cleaning
- Drilling test facility visit

**AUDIENCE**

Drilling engineers, drilling supervisors, and trainee directional drillers.

**PREREQUISITE**

Basic drilling engineering, 1 to 3 years of wellsite experience, some previous exposure to directional drilling, and mathematical skills, particularly trigonometry.

**Cement Integrity Assurance and Evaluation**

**Skill – 5 Days**

This course includes a detailed review of the cementing processes and parameters that ensure the integrity of the cement sheath during the life of the well. A comprehensive cement sheath evaluation section will be presented covering the various measurements and interpretation techniques as well as the factors that affect the quality of the measurements and interpretation. The course includes classroom sessions on cementing practices, log interpretation and a visit to the nearest Schlumberger facility where attendees will have the opportunity to review cement evaluation technologies. The attendees will be encouraged to bring their own examples that include all associated information such as well construction details, cementing, and log data, allowing the attendees to share their data and discuss their experiences.

**COURSE CONTENT**

- Introduction to cementing
- Cementing job parameters affecting the cement integrity
- Drilling, casing, and cementing job parameters
- Review of the gas/fluid invasion process
- Introduction of well completion parameters affecting the well life
- Cement sheath mechanical properties
- Failure causes

**NOTES**

Visit NExTraining.com/classes for the latest calendar or to register for a course.
• Cement integrity during the plug and abandon (P&A) phase
• Wireline logs typically used for cement evaluation
• New API specifications

AUDIENCE
Drilling, production, and completion engineers.

PREREQUISITE
Basic knowledge of cementing and logging operations.

**Horizontal, Extended Reach, and Multilateral Drilling**

**Skill – 5 Days**

An integrated approach to the design and drilling of horizontal, extended-reach (ER), and multilateral wells includes geologic, reservoir, drilling, completions, and production considerations. Attendees will learn the applications and limitations of ER drilling technology and the essential deliverables from each asset team member needed to implement successful ER wells.

**COURSE CONTENT**

- Directional drilling fundamentals: Applications and limitations
- Directional well planning: Positioning and coordinate systems
- BHA design and considerations
- Geologic considerations in ER wells
- Well profile, well path, and trajectory design
- Earth modeling and wellbore-stability matters related to ER wells
- Multilateral well introduction, well planning, and drilling operations
- Life-of-well issues for high-angle and multilateral wells
- Casing design for ER and multilateral wells

AUDIENCE
Drilling, production, and completion engineers.

PREREQUISITE
Basic knowledge of cementing and logging operations.

**Well Design and Construction Engineering: Heriot-Watt University Program**

**Skill – 5 Days**

Delivering an overview of the well construction process and an introduction to subsea drilling operations, the goal of this course is to provide attendees with an insight into the planning and execution of a drilling operation. Emphasis is on the conceptual design and detailed engineering design calculations involved in planning a well. This course is part of the distance learning Heriot-Watt MSc Petroleum Engineering program but is not limited to individuals who are registered for the degree course.

Note: To learn more about the Heriot-Watt MSc Petroleum Engineering program, visit NExTtraining.net/Masters

**COURSE CONTENT**

- Overview of drilling operations and drilling economics
- Rig components
- Drillstring and drilling bit design and selection
- Formation pressures and well control
- Principles of primary and secondary well control
- Well killing procedures
- BOP equipment stack arrangements
- Design, selection, and use of drilling fluids
- Casing and casing string design, configurations, and running operations
- Cementing function, design, and properties
- Directional drilling design and equipment

**HPHT Well Engineering**

**Skill – 5 Days**

This 5-day course addresses all of the aspects of HPHT well construction process. It covers the theories, technicalities, and practicalities of drilling and completing HPHT wells. This course explains the fundamental challenges associated with higher pressures and temperatures and provides the information to start planning and drilling HPHT wells. It covers the fundamental challenges associated with HPHT drilling and completions. A number of practical exercises and interactive discussions will address all of the issues and technical challenges. Case studies from HPHT projects will be presented and analyzed, and a complete HPHT program is used as practical guide for this course.

**COURSE CONTENT**

- Defining the HPHT environment
  - History of HPHT drilling operations
  - Applicable standards and guidelines
  - Geological and geophysical aspects of abnormal pressures
  - Differences between HPHT drilling and normal well operations
  - Challenges in HPHT Wells
  - Pore pressures and fracture pressures and pressure ramps
- Wellbore stability
- Temperature Gradients
- Design considerations
- H2S and CO2 effects
- Torque and drag
- Fingerprinting the well
- Pit discipline
- Operational front-end planning requirements
- Managed pressure drilling
- Circulation
COURSE OFFERINGS

- HPHT formation evaluation, logging, coring
- New technology for formation evaluation
- HPHT well testing
- Mud types and selection
- Equivalent circulating density issues
- Temperature effects, mud coolers
- Barite sag
- Compressibility
- Fluid stability
- Elastomer compatibility
- Water versus oil base muds
- Gas solubility effects in oil base mud
- Alternative drilling fluids
- Solids control equipment
- Gas expansion/dissolved gases in mud
- Formation charging/ballooning
- Lost circulation
- HPHT well control procedures and equipment
- Stripping/tripping/connections
- Types of rigs and suitability
- Rig equipment rating
- MGS sizing
- HPHT Well Testing Practices

AUDIENCE
At least 5 years of experience in well construction and understanding of HTHP well issues

Drillstring Design

Skill – 4 Days

Attendees will gain a comprehensive overview of how to design a drillstring as well as how to avoid operational problems and wear on equipment. Bottomhole assembly (BHA) design concepts and optimization and drilling hydraulics are investigated, with an emphasis on practical and safe operating procedures. Industry standards are used as training aids to supplement the presentation material and promote a thorough understanding of drillstring component operating limits and practices.

COURSE CONTENT
- Steel properties
- Axial force and buckling in submerged tubulars
- Drillpipe connections
- Drillstring design for tension and torque
- Drillstring care and inspection
- Drillstring damage and dynamics
- Workover stability

IMMERSIVE LEARNING PROGRAMS

- Mud rheology
- Bit hydraulics
- Rotary steerable system (RSS), and motor BHA design

AUDIENCE
Drilling engineering staff and drilling service company personnel.

PREREQUISITE
Work experience in drillstring design or drilling operations.

Mud School - European Learning Center

Skill – 30 Days

The core content of this course will cover all the main pillars of drilling fluids activities linked to drilling and completion operations, with safety best practices being a primary focus throughout the course. Building from MI-SWACO segment knowledge and expertise, this course will be articulated around detailed theoretical knowledge for drilling fluids (both WBM and OBM) and completion fluids, followed by hands on practical experiments in a dedicated laboratory environment.

COURSE CONTENT
- School Induction and Drilling Fluid Functions
- Basic Chemistry of Drilling Fluids
- Clay Chemistry and Composition
- Polymers and Their Function
- Rheology
- Standard Mud Tests with Lab Session
- Composition of Water Based Drilling Fluids with Lab Session
- Water Based Systems and Additives
- High Performance and HPHT Water Based Muds with Lab Session
- Filtration Control with Lab Session
- Mud Contamination and Treatment with Lab Session
- Lost Circulation with Lab Session - Basic Mud Check
- Corrosion
- Solids Analysis with Lab Session
- Safety Data Sheets (SDS or MSDS) with Lab Session
- Oil and Synthetic Based Mud Products and Systems
- Standard Mud Tests for OBM/SBM
- Lab Session - Conventional and Synthetic Muds
- Lab Sessions - Oil Systems with Relaxed or High Filtrate and Megadril - All-in-one Emulsifier Package
- HPHT Challenges, Applications and Systems
- Solid Control Equipment and Drilling Waste Management
- Solid Control and Drilling Waste Management with Lab Session
- Lab Sessions: Build Bentonitic Mud System, and Build a Polymer Mud System
- Stuck Pipe Problems
- Lab Session Methylen Blue Test and Effect of Solids Content on Mud Properties
- Hole Cleaning and Lab Session for WBM Problems
- Reservoir Drill-in Fluids and Completion Fluids - day 1
COURSE OFFERINGS

- Reservoir Drill-in Fluids and Completion Fluids - day 2
- Well Clean up and Displacement Procedures
- Lab Session - Final Lab Session - Treat Contaminated Mud System

AUDIENCE
Drilling Engineers, Drilling Supervisors, Production Engineers, Drilling Fluids Supervisor, Drilling Fluids Superintendent

PREREQUISITE
A basic knowledge of drilling operations with wells exposure is preferable.

Cementing Operations

Skill – 5 Days

The course introduces attendees to the aspects of primary, squeeze and plug cementing, and primary cementing calculations. Cement chemistry is introduced to understand the process involved in achieving a satisfactory cement job. Additives used to affect various properties of the slurry and set cement are addressed. Rheological models used during cement job design and requirements for effective mud removal will also be covered. Cementing aids and job quality evaluation methods are discussed. Classroom exercises as well as an introduction to cementing design and evaluation software are included.

COURSE CONTENT
- Primary cementing overview and calculations
- Cement chemistry
- Cement laboratory equipment
- Rheology
- Cement additives
- Mud removal
- Gas migration control
- Cementing temperature
- Squeeze cementing
- Cementing plugs
- Introduction and review of cementing design and evaluation software
- Special purpose cements

AUDIENCE
Drilling professionals with some understanding of the drilling process.

PREREQUISITE
Basic knowledge of the oil & gas industry. Some understanding of cement use is strongly recommended. Attendees should bring a hand calculator and be prepared to perform exercises in the class.

Stuck Pipe Prevention

Skill – 4 Days

This course provides an detailed overview of stuck pipe prevention - the causes of stick pipe and the techniques to avoid and recover from stick pipe events through an interactive classroom. Investigation techniques are discussed during the workshop sessions in order to cover the mechanisms, freeing procedures and prevention of stuck-pipe.

COURSE CONTENT
- Introduction

Stuck Pipe Prevention

Skill – 4 Days

This course provides an detailed overview of stuck pipe prevention - the causes of stick pipe and the techniques to avoid and recover from stick pipe events through an interactive classroom. Investigation techniques are discussed during the workshop sessions in order to cover the mechanisms, freeing procedures and prevention of stuck-pipe.

COURSE CONTENT
- Introduction
Managing Drilling Operations (with Drilling Simulator)

Skill – 5 Days

This 5-day course will use a computer-based drilling operations management simulator to drill a well in a virtual environment. Participants will role play key rig-site jobs to construct a well following a drilling program. The simulator will provide virtual on-the-job-training by recreating the rig site setup of the driller’s station, a drilling supervisor’s station, and mud engineer’s station. A graphical interface will provide a window into rig floor operations for the entire class. The instructor will act as a mentor, offering group skills training across a wide spectrum of drilling activities within the simulated operational scenario.

COURSE CONTENT

- Simulator overview and familiarization
- Simulation 1: spudding the well and surface hole interval
- Simulation 2: intermediate hole
- Simulation 3: intermediate hole continued
- Simulation 4: production hole

AUDIENCE

Trainee wellsite supervisors, drilling supervisors, drilling engineers, directional drillers, and mud engineers

PREREQUISITE

Knowledge of drilling, drilling engineering, cementing operations, BHA design fundamentals, cementing program designs, rig awareness, and drilling operations

Practical Cementing

Skill – 3 Days

This 3-day course is designed to provide participants with an understanding of cementing technology used in both primary and remedial cementing operations. Slurry design concepts, additives used, and their purposes will be covered so that participants can evaluate proposed designs and understand the purpose and importance of additives. The importance of mud removal and methods, which may be chosen to accomplish effective mud removal, will be explored. The course will cover job execution and procedure to enable participants to outline cement jobs to be performed on oil and gas wells. Bulk blending and handling equipment will be discussed to ensure familiarity with basic cementing equipment. New technologies and uses of cement in oil and gas wells will be covered to show how these new technologies can be used to combat gas migration, lost circulation, and cement quality. Cement job evaluation will be covered, with specific training on cement evaluation logs and interpretation. Hands-on workshops and case studies will be used to explain a number of different cementing topics. Cement performance related to industry standards and their applications on land and in deep water will also be discussed.

COURSE CONTENT

- Cement technology
- Cementing goals
- Understanding cementing design software
- Lab tests
- Cement lab tour and lab demonstrations
- Equipment and Job Performance
- Cementing equipment overview
- Gel strength and gas migration
- Cement placement calculations
- Plug cementing
- Squeeze cementing theory
- Lost circulation

AUDIENCE

Individuals with a need to broaden their understanding of well cementing and build on their working knowledge of cement technology and job execution

PREREQUISITE

Technical background with a basic understanding of well operations, involving casing installation and cement job design and execution

Mud Logging—Surface Gas Measurement and Fluid Characterization

Skill – 5 Days

This course consists of theoretical classroom sessions led by an experienced professional providing in-depth explanation of gas analysis at the surface. The theoretical classroom sessions will be complemented with practical exercises covering the types of gas encountered during drilling, degassing apparatus, gas analysis technology, and real-time gas interpretation exercises. The course will provide a clear understanding on how gases are generated during drilling, how they are carried to surface, the technology to extract the gas from the drilling fluids, the technology used for gas analysis, and best practices for the interpretation of gas data to better reflect what is occurring downhole.

COURSE CONTENT

- Origins of gas in mud
- Degassing process
- Different degassing techniques
- Gas analysis technology
- Gas interpretation generalities
- New technologies
- Gas corrections
- Interpretation methodologies
- Degassing case studies

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Practical Cementing Operations

Foundation – 5 Days

This foundational 5-day course covers aspects of primary, squeeze, and plug cementing, as well as primary cementing calculations. Cement chemistry will be introduced to give participants an understanding of the processes involved in achieving a satisfactory cement job. Additives used to affect various properties of the slurry and set cement will be addressed. Rheological models used during cement job design and requirements for effective mud removal will be covered. Participants will also learn about cementing aids and job quality evaluation methods, as well as laboratory tools, methods, and demonstrations, which will be used to illustrate the quality aspects of cementing. Classroom exercises, hands-on workshops, and case studies will be used to explain a number of different cementing topics. Cementing design and evaluation software will be demonstrated to illustrate the importance of a properly engineered cement design and procedure.

COURSE CONTENT

- Cement Technology
- Cementing goals
- Understanding cementing design software
- Lab tests
- Cement lab tour and lab demonstrations
- Equipment and job execution
- Cementing equipment overview
- Gel strength and gas migration
- Cement placement calculations
- Remedial cementing
- Plug cementing
- Squeeze cementing theory
- Lost circulation
- Cement job evaluation
- Cement bond logs
- Cement evaluation log interpretation
- Cement bond log workshop
- Remedial job performance and computer applications
- Plug and squeeze cementing calculations
- New technologies in cementing (demonstrations)
- Cementing software
- Roundtable

AUDIENCE

Drilling professionals with a basic understanding of the drilling process and designer and operation personnel

PREREQUISITE

Basic knowledge of the oil and gas industry and some understanding of well construction and cement use is strongly recommended. Participants will need to bring a hand calculator to perform exercises in class.

Drilling Optimization

Skill – 5 Days

Structured to guide the attendees through the workflow to achieve optimal outcomes, or no-surprises drilling, for each phase of drilling a single well or a drilling program, this course covers specification, design, drilling, and completion. Increase your understanding of the identification, application, and implementation of drilling optimization techniques that highlight the data, calculations, and processes necessary to validate drilling successes, both qualitatively and quantitatively. The course draws upon aspects of risk management and statistical analysis as a framework for measurement and mitigation.

COURSE CONTENT

- Variable versus fixed risks and controllable versus uncontrollable constraints in design and implementation
- Mitigation strategies for risks and constraints, including mechanical configuration, logistics, surface and subsurface environments, and trajectory; regulatory policies
- Statistical analyses related to well construction, including probability, mean distribution, and standard deviation
- Key performance indicators (KPIs) as a means to report project progress and results
- Ensure data collection, management, and quality via data KPIs
- Single well drilling and program benchmarking
- Mechanical earth model (MEM) for planning and operations
- Optimal drilling plan designs that optimize KPIs for each drilling phase
- Real-time management of well construction performance

AUDIENCE

Drilling engineers.

PREREQUISITE

Minimum of 2 to 4 years of drilling engineering; experience in risk management or project management suggested.

Well Architecture and Drilling in Shale Plays

Skill – 5 Days

This 5-day course is designed to increase understanding of the essential aspects of well architecture and drilling in unconventional resource plays to enable asset team members to make better field development decisions. The course covers some high-angle lateral well issues and ties drilling mechanics to the geoscience covered in previous weeks. It also covers the necessary fundamentals of well architecture and drilling in shale plays. The class includes: best practices in survey and anti-collision; well design and pad drilling; overview of motors and rotary steerable systems; geosteering, MWD systems, and key LWD tools for unconventional lateral wells; BHA design and components, bit selection and optimization and drilling fluids; and hydraulics, hole cleaning, wellbore integrity, torque and drag. Throughout the course, field examples and practical aspects will be used to reinforce the learning experience.

COURSE CONTENT

- Surveys: concept of spatial relationship through accelerometers, magnetometers, and gyros; environmental issues caused by magnetic field variations, metals, etc.; capturing and validating static surveys; understanding EOU and traveling cylinder plots, and anticollisions practices
- Well design and pad drilling: considerations in well design, from lease line constraints to fracture wing length to dogleg capabilities of tools; and pad drilling
Deepwater Drilling Design and Operations

Skill – 5 Days

This course is designed to help drilling engineering professionals understand the technologies, terminology, concepts, processes, and equipment used to drill deepwater oil and gas wells. The course follows a typical deepwater drilling program and drilling process from geology to rig selection and station keeping to conductor driving and surface casing setting followed by wellhead systems, BOP and marine riser systems to typical deepwater rig equipment. Once the drilling process and equipment is reviewed, we then look at some of the other aspects that are different for deepwater drilling technology such as well control, shallow hazards and then we move to some of the new emerging technologies such as dual gradient and managed pressure drilling. Finally we discuss some of the typical operational aspects and workover issues associated with deepwater wells.

COURSE CONTENT

• Drilling units
• Drilling equipment specific to deepwater drilling
• Pore pressure and fracture pressure window
• Well control
• Riser selection
• Hydrates
• Drilling fluids
• Dual gradient and managed pressure drilling
• Completions

AUDIENCE

Drilling professionals with well design and operations experience desiring an understanding of the challenges faced in the deepwater drilling environment.

PREREQUISITE

Understand basic geomechanics, drilling operations, well placement, well planning, and drilling fluids basics.

Advanced Remedial Cementing (Russian)

Skill – 3 Days

This 3-day course (available in Russian only) presents the techniques for diagnosing the sources of unwanted water and covers the remedial cementing techniques available to eliminate those undesirable sources of water.

COURSE CONTENT

• Integrated approach to water-cut problems in mature and new fields
• Key problems related to water cut
• Water-cut problem classification and selection of optimal remediation plan
• Logging diagnostics

Deepwater Well Project and Risk Management

Skill – 5 Days

The main goal of the course is to highlight the critical project and risk management issues required to run deepwater well projects efficiently, safely, environmentally friendly and cost-effectively. By the end of the course, attendees will understand the key issues and principles of deepwater project management. The attendees will be able to apply the principles in practice and integrate them in the asset or project team to optimize management of the well project and manage the identified risks to maximize value. Following the deepwater well project management process from prospect evaluation through operations, attendees will develop important skills needed to drill wells in a deepwater environment. The attendees will understand the complexities of a deepwater drilling operation and will gain an understanding of issues that must be addressed when drilling deepwater wells.

COURSE CONTENT

• Introduction to project management
• Project setup
• Team responsibilities and decisions
• What is risk?
• Risk management
• Project plan
• Tracking progress
• Risk management in action
• Applying risk management tools
• Human factors in deepwater well projects

AUDIENCE

Drilling managers, operations superintendents, senior well engineers, well engineers, and wellsite leaders/supervisors involved in deepwater well projects.

PREREQUISITE

Foundation Drilling Engineering and Offshore Drilling Operations courses, and basic experience in well projects.
Well Integrity: Life of the Well

Skill – 5 Days

This 5-day course is designed to prepare participants to manage well design, construction, surveillance, and documentation of well integrity for a life-of-well philosophy. Emphasis is on industry standards and guidelines as they relate to barrier construction, monitoring, and management to give participants the tools to safely and reliably construct and verify the integrity of the well.

COURSE CONTENT

- Well barriers
- Course overview
- Well integrity elements and issues
- Well barrier issues
- Well Barrier Verification
- Well barrier elements: subsea wellheads
- Well barrier element selection and issues in intervention and abandonment
- Annular pressure buildup
- Abandonment/suspension
- Well integrity management systems (WIMS) and safety and environmental management Systems (SEMS)

AUDIENCE

Managers, engineers, specialists, and operations supervisors responsible for ensuring the integrity of the organization’s well assets

PREREQUISITE

- Individuals with a need to understand how wells are constructed, and their purpose
- Understanding of well design concepts, general quality assurance methods, verification and risk management fundamentals
- Understanding of industry standards and guidelines and the role they play in the overall philosophy of well construction

Stuck Pipe and Fishing Operations

Skill – 5 Days

Attendees will learn the causes of stuck pipe and twist-offs and the techniques employed to avoid such problems. The attendees will also learn the investigation techniques, operations, selection of fishing tools, and decision-making methods. Discussions include techniques to prevent problems leading to fishing operations and operational techniques to recover the fish or to sidetrack the well.

COURSE CONTENT

- Wellbore designs, types, and loading of submerged tubulars
- Steel mechanics and drillstring design, including API RP 7G
- Understanding and preventing drillstring failures
- Stuck pipe mechanisms and consequences
- Predicting and preventing stuck pipe and lost circulation
- Fishing operations: Causes, prevention, tools, and operations
- Directional drilling and sidetracking in cased and open holes

AUDIENCE

Engineering, operations, and managerial team members interested in the practical aspects of drillstring recovery and the business implications of fishing operations.

PREREQUISITE

Basic understanding of drilling operations and basic math skills.

Drilling Project and Risk Management

Skill – 5 Days

Increase your understanding of the project management principles that apply to drilling operations, with a focus on the roles and responsibilities involved, including operations, personnel, administration, finance, and legal functions. Attendees will examine the critical project and risk management concerns of running drilling projects in an efficient, safe, environmentally friendly, and cost-effective manner. The attendees will apply principles of project management in practice and integrate those principles into a drilling project’s assets or project team to optimize value and reduce identified risks.

COURSE CONTENT

- Overview of drilling project management
- Contract models, project planning, planning software, and design
- Drilling programming
- Project finance and administration
- Supply chain management
- Reporting systems
- Project closeout

Stuck Pipe and Hole Cleaning

Skill – 5 Days

In this course on the mechanisms and causes of stuck pipe, special attention is given to understanding the impact of hole cleaning. Attendees will also learn how factors such as casing seat selection, drillstring design, drilling fluids selection, and well design can affect the likelihood of stuck pipe.

COURSE CONTENT

- Causes of stuck pipe; mechanisms and consequences
- Casing setting depth
- Forces acting on submerged objects
- Drillstring design
- Wellbore stability and causes of instability
- Lost circulation and its causes
- Economics of hole recovery efforts
- Drilling fluid types, selection, and fluids management
COURSE OFFERINGS

- Rheology of drilling fluids
- Mechanical techniques for hole cleaning
- Hole cleaning monitoring and management techniques

AUDIENCE
Field supervisors and engineers involved in drilling operations.

PREREQUISITE
Basic understanding of drilling operations.

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Practical Real Time Operations for Well Construction with InterACT and Petrel

Skill – 4 Days

This course focuses on enabling successful delivery and utilization of real time data from drilling operations. Starting with the fundamentals of connectivity and bandwidth requirements for different data sources it will then move on to cover the most widely used data formats. Focusing on WITS* and WITSML** data, hands on exercises will show the advantages and limitations of these common data formats. The course will also detail the recent developments and technical advantages of adopting the WITSML standard. Attendees will learn how to optimize display of real time data via a browser based system using “InterACT” and then learn, using “Petrel”, the concept and advantages of delivering real time data to desktop application using the WITSML API.

COURSE CONTENT
- Module 1: Telecommunications
- Satellite Connectivity
- Terrestrial Connectivity
- Bandwidth Requirements / Network Management
- Module 2: Real time Data Sources
- Surface data
- Downhole data
- Data delivery formats and methods
- Module 3: Data Delivery
- Dealing with WITS (Wellsite Information Standard) Data
- The WITSML Standard, development and utilization.
- Other Standards / Data Types
- Data Gathering and Delivery
- Visualizing and Sharing Real Time Data
- Module 4: Application of Real time Data
- Web / Browser based delivery
- Real Time Data in Desktop Applications (WITSML Enabled)
- Real Time data for Geologist, Engineers and the asset team.
- Enabling “Integrated Operations”
- Drilling Optimization and Operations Support Centers (OSC)
- Module 5: Drilling Optimization and Operations Support Centers (OSC)
- Real Time for Drilling Optimization
- Remote collaboration
- Risk & Event data

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Directional Drilling and Surveying

Foundation – 5 Days

Attendees will learn the fundamentals, design considerations, and operational aspects of directional and horizontal drilling. This course will increase your understanding of the operations carried out by directional drillers and how directional and horizontal wells are designed and drilled.

COURSE CONTENT
- Directional drilling fundamentals, applications, and limitations
- Terminology, well objectives, and target
- Well path planning: Calculations and data acquisition
- Measurement while drilling
- Downhole equipment: Drilling tools, motors, bits, and bottomhole assemblies
- Wellsite operations
- Reservoir concerns for directional well design
- Drilling and surface considerations
- Torque and drag modeling
- Horizontal wells: Types and planning
- Logging, coring, and completion techniques
- Wellbore-stability issues and hole cleaning

AUDIENCE
Wellsite and Operations Geologists and Drilling Engineers, Drilling and Sub Surface asset team members and Technical and Support staff actively or planning to make efficient use of real time data from drilling operations.

PREREQUISITE
Familiarity with use and / or management of wellsite real time data.

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Fundamentals of Petroleum Geomechanics

Foundation – 5 days

Attendees will learn the fundamentals of rock mechanics, the origin of stresses in the subsurface, and how in situ stresses can be understood from wellbore data. This course, using classroom instruction, exercises, and workshops, teaches attendees how to apply in situ stress data to critical problems in exploration and development.

COURSE CONTENT
- Impact of geomechanics on oilfield development: Drilling, completions, and field production life
- Principal stresses, pore pressure, effective stresses, stress and strain, elasticity, yield, and failure envelopes
- Laboratory testing: Procedures, limitations, unconfined compression, triaxial compression, thick-walled-cylinder tests
- State of stress in the Earth, pore pressure, and fracture gradient

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COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Wellbore instability
- Mechanical earth model construction, operational aspects of wellbore stability control
- Sand production and prediction
- Reservoir geomechanics

AUDIENCE
Technical professionals or managers concerned with wellbore stability, fracture stimulation, reservoir drainage patterns, naturally fractured reservoirs, overpressures, and fault seal analysis.

PREREQUISITE
None

Drill Bits and Hydraulics

Foundation – 2 Days

This course will give the attendee in-depth knowledge of the International Association of Drilling Contractors (IADC) Drillbit Classification system, nomenclature, and dull grade reporting procedures. Attendees will learn about the two major classes of drill bits commonly used in oilfield drilling and review drillbit design, drillbit cutting structures, and perform drillbit application exercises. The importance of drillbit hydraulics in the drilling process will be reviewed and the use of hydraulic calculation software/applications highlighted.

COURSE CONTENT
- Drillbit types and classes
- Rock-bit technology
- IADC classification and nomenclature
- Minimizing risk
- Drillbit hydraulics
- Fixed-cutter technology
- IADC drillbit dull grade reporting

AUDIENCE
Junior drilling engineers, junior well and operations engineers, as well as other personnel involved in well planning and drilling.

PREREQUISITE
General understanding of drilling operations, oilfield mathematics, and geology.

Fundamentals of Cementing Operations

Foundation – 5 Days

This 5-day course is designed to increase the participants’ knowledge of well cementing services and help them understand specific technical design and operational considerations to better understand, use, or supervise cementing operations. Participants will be encouraged to discuss their cementing local best practices, case studies, and lessons learned whenever applicable during classroom group discussions.

The course is primarily theory driven but will include a practical demonstration on rig site cementing equipment (mixers and pumps). There will also be several class-based exercises to enhance the overall learning experience. Additionally, demonstration kits will be used to emphasize subject items whenever applicable. It will begin with an HSE orientation.

COURSE CONTENT
- Introduction to cementing operations
- API cement classification
- Basic cement chemistry and manufacturing
- Primary cementing
- Cement slurries design
- Cement slurry selection
- Mud removal
- Gas migration
- Cement equipment, plug placement, and software
- Cementing equipment
- Remedial cementing
- Software demonstration
- Cement evaluation and cement job practical
- Cement job design and execution
- Rig site cement job practical
- Specialized and new technology cement systems
- Software demonstration
- Roundtable and course close

AUDIENCE
Engineers or field supervisors with limited or no experience in cementing

- Control of shallow gas kicks
- Blowout preventer and diverter equipment installation, operation, maintenance, and testing
- Well-control equipment limits, auxiliary units, and closing units
- Subsea equipment overview

AUDIENCE
Persons who design, plan, and manage well drilling operations, including wellsite supervisors, drilling engineers, and drilling superintendents.

PREREQUISITE
Minimum of 1 year drilling-related experience and basic math and science skills; participants are required to bring a hand-held calculator for in-class exercises.

Well Control

Foundation – 5 Days

This course teaches the physical principles and concepts related to maintaining and regaining control of formation pressures while drilling a well.

COURSE CONTENT
- Formation pressures and their causes
- Fracture pressure fundamentals
- Kick tolerance, causes, and warnings
- Shut-in procedures
- Industry standards and recommended practices
- Kill sheet basics and usage
- Wait-and-weight method and other well control methods
operations; experienced professionals who seek to consolidate the basic concepts, enhance design, and evaluation skills of cementing operations, and noncementing technical personnel with a need to increase their knowledge of well cementing.

**PREREQUISITE**

None

### Well Placement Fundamentals

**Foundation – 5 Days**

This course introduces the concept of geological well placement (geosteering) and provides knowledge of the processes and techniques that can be used to successfully place high-angle and horizontal wells using geological and petrophysical data in real-time during drilling. The main purpose of high-angle and horizontal wells is to maximize reservoir contact and enhance well productivity. To plan and construct such wells requires real-time collaboration between geologists, who need quality formation evaluation data; drillers, who require considerable input from the geologists; and petrophysicists, who interpret the formation evaluation data during the drilling process to optimize well placement. This process is generally facilitated by the well placement coordinator. Various technologies involved in directional drilling, measurement, and formation evaluation while drilling are reviewed. The three different methods used to geologically place horizontal wells are introduced and the applications are discussed.

**COURSE CONTENT**

- Introduction to geological well placement
- Review of reservoir geology
- Directional drilling
- MWD
- Formation evaluation and LWD
- Applications of LWD measurements in well placement
- Applying well placement methods
- Case studies illustrating the use of the three well placement methods

**AUDIENCE**

Multidisciplinary asset teams of operating companies comprised mainly of drilling engineers, reservoir engineers, and geoscientists who need to make decisions regarding the applicability and benefits of implementing a geological well placement process for drilling horizontal and high-angle wells.

**PREREQUISITE**

Geoscience or engineering degree.

### Basic Cementing (Russian)

**Foundation – 5 Days**

This 5-day course (available in Russian only) covers the basic concepts of primary cementing and illustrates the adverse effects of a poor quality cement job on well performance. Remediation using squeeze cementing techniques is covered. The physical and chemical properties of cement slurries and cement evaluation techniques are reviewed. Participants will design a cement job and perform a cement evaluation as a class project.

**COURSE CONTENT**

- Welcome and introduction
- Primary cementing overview: objectives, basics, and problems of zonal isolation
- Cement chemistry
- Cementing materials and additives
- Implications of well integrity on well performance
- Implications of cement quality on well performance
- Sources of water influx
- Solutions and technologies
- Squeeze Cementing
- Squeeze cementing overview: SqueezeCRETE* remedial cementing solution, methodology, equipment, and tools
- Performance characteristics of cement slurries
- New cementing technologies: AccuSET* broad temperature range, engineered cement; FUTUR* self-healing cement system; GASBLOK* gas migration control cement system, FlexSTONE* advanced flexible cement technology, and CemCRETE* concrete-based oilwell cementing technology
- Introduction to cement evaluation: CBL, VDL, and USIT
- Plug cementing
- Discussion and question-and-answer session
- Group projects: cementing design and evaluation exercises
- Group Discussion
- Examination
- End of course recap and participant feedback

**Basic understanding of drilling and completions**

### Introduction to Deepwater Rig Operations

**Foundation – 5 days**

This course will describe the different types of deepwater drilling units, including the specific equipment requirements and techniques to spud a well. The goal of this course is to expose the attendees to brief but precise information on floating drilling rigs (semisubmersible [SS] and dynamically positioned drillship [DPDS]) and their specific equipment for drilling wells in deepwater zones. Techniques and methods employed extending from the arrival of floating drilling units on a location until the cementing of the casing will be presented. Major issues and solutions faced in deepwater drilling operations is also included as well as the environmental forces and their impacts on deepwater operations. Key learning objectives of this course include what is an SS and a DPDS with their advantages and disadvantages; description and functioning of all specific equipment deployed in deepwater operations, either on the floating rig or subsea (riser, blowout preventer [BOP], wellheads, tensioners, etc.); the different station keeping methods for maintaining a floating drilling vessel on location (mooring, dynamic positioning); and the environmental forces and their impact.

**COURSE CONTENT:**

- Floating drilling units
- Vessel stability
- Mooring systems
- Dynamic positioning operations
- Riser systems
- Subsea wellheads and casing operations

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Geomechanics for Drilling Engineers

Foundation – 5 Days

This 5-day course is designed to introduce drilling department personnel to the fundamentals of geomechanics and its role in well programming and operations. The course will cover the stress tensor, experimental rock mechanics, as well as principal earth stresses and the origins of pore pressure (including methods for measurement of pore pressure). Course content will include details about the concept and construction of mechanical earth models (MEMs), wellbore geomechanics, modes of rock deformation, and wellbore deformation. Lecture topics include how to plan for wellbore stability, implementation of geomechanics while drilling, wellbore strengthening, and drillbit mechanics. Participants will build a MEM and apply it to a proposed high-angle production well from a field development plan.

COURSE CONTENT
- Introduction
- Fundamentals of rock mechanics
- How geomechanics used to design wells and support drilling
- The stress tensor
- Experimental rock mechanics
- Principal earth stresses
- Origins of pore pressure
- Methods for measurement of pore pressure
- Concept and construction of a MEM
- Wellbore geomechanics
- Modes of rock deformation in the wellbore
- Wellbore deformation in fractured rock masses
- Planning for wellbore stability
- Implementation of geomechanics while drilling
- Wellbore strengthening
- Drillbit mechanics
- Working in teams to build an actual MEM that will be used to design a wellbore stability plan for a proposed high-angle well for the field development plan.

AUDIENCE
All drilling personnel (e.g. drilling engineers and operations/planning engineers) involved in planning well operations.

PREREQUISITE
Basic knowledge of drilling and awareness of well planning and programming.

Drilling Fluids

Foundation – 5 Days

This course provides attendees with a comprehensive understanding of drilling fluids and instruction on the engineering of a mud system, including both water- and oil-based mud systems.

COURSE CONTENT
- Introduction to drilling fluids: Properties, purpose, and problems
- Regulatory compliance and environmental considerations
- Formation damage
- Inhibition
- Lubricity
- Economic restrictions
- Fluid density
- Rheological properties
- Solids control
- Waste management
- Loss control measure and troubleshooting

AUDIENCE
Drilling engineers wanting a better understanding of drilling fluids and their use.

PREREQUISITE
Working knowledge of drilling practices and concepts.

Petrophysics for Drilling Engineers

Foundation – 5 Days

This 5-day course covers the following major fields: (1) Basics of well logging, reservoir rock basics in the logging life of a well, tool conveyance, mud log, wellbore stability and filtrate diameter of invasion depth control log quality control, gamma ray, and spontaneous potential, including tool physics and applications to estimate clay volume, clay type, and formation water salinities. (2) Porosity and lithology using density and neutron tools; physics and applications. (3) Acoustic tool physics and applications for rock mechanics, wellbore stability, and secondary porosity In addition to the applications of acoustic tools for predicting high-pressure zones. (4) Resistivity tool measurements, including tool physics of shallow Rxo, laterolog, and induction and advanced technology resistivity tools. (5) Wireline formation testing tool physics and the theory and applications of these tools to determine mobilities, reservoir pressure and fluid contacts in the reservoir. (6) MWD and LWD data acquisition data acquisition of porosity, lithology, pulsed neutron sigma, and resistivities. (7) Formation pressure geosteering basics and seismic and LWD data acquisition data acquisition of porosity, lithology, pulsed neutron and laterolog, and induction and advanced technology resistivity tools. (8) Wireline formation testing tool physics and the theory and applications of these tools to determine mobilities, reservoir pressure and fluid contacts in the reservoir. (9) MWD and LWD data acquisition data acquisition of porosity, lithology, pulsed neutron sigma, and resistivities. (10) Formation pressure geosteering basics and seismic interpretation covering the evaluation of clay volume (Vsh, Vcl) evaluation, estimating the m and n parameters in the Archie Equation, quicklook techniques to estimate the oil/water, gas/water, and oil/gas contacts, salinity estimations of formation water and filtrate water, and unmoved hydrocarbon zones plus estimation of porosity, lithology, and water saturations in clean and in shaly sands.

COURSE CONTENT
- Reservoir rock and life of a well
- The mud log and its applications
- Basics of well logging
- Log quality control
- Resistivity measurements and the spontaneous potential applications to estimate water salinity and volume of shale

PREREQUISITE
Basic knowledge of drilling practices and concepts.
COURSE OFFERINGS

- Acoustic Log: Secondary porosity, rock mechanical properties and wellbore stability
- The Neutron Log, neutron spectroscopy and sigma neutron capture cross-section
- Basics of resistivity and the Archie Equation
- Wireline formation testing
- MWD and LWD
- Estimating the “m” and “n” parameters in the Archie equation
- Quicklook techniques

AUDIENCE
Drilling engineers, directional drillers, and other geoscientists associated with drilling.

PREREQUISITE
None

Mud Logging Operations
Foundation – 5 days

This 5-day course consists of practical and theoretical sessions in the classroom, mud logging unit, and workshop. Experienced professionals provide in-depth details on mud logging services, coupled with hands-on practical learning centered on a state-of-the-art training environment at the Schlumberger ELC located in Melun, France. The practical sessions use the mud logging unit, acquisition sensors and sample analysis equipment, geological laboratory, and rig-based training. The course will provide a clear understanding of the primary objective of mud Logging services, which is surface measurement of drilling parameters, gas data, and geological information.

The 5-day course focuses on understanding drilling operations monitored through a mud logging system, helping to understand the principle of gas measurements, and to comprehend how geological descriptions are performed together with the process of building a lithostratigraphic column. By the conclusion of the course, participants will have an improved understanding of the added value of mud logging data, be familiar with all elements related to data quality control, and have the skills needed to challenge the data quality. This course is only available at ELC Melun, Paris.

COURSE CONTENT
- Drilling monitoring
- Type of gas
- Degassing process and analysis
- Geological sample preparation and description

AUDIENCE
Geoscientists and engineers wishing to have hands on training in mud logging.

PREREQUISITE
None

Drilling Engineering
Foundation – 5 Days

In this course, attendees will be introduced to the terminology, concepts, processes, and equipment used to drill oil and gas wells. Attendees will learn rig component identification, simple rig-sizing calculations, drilling fluid properties, drill bit selection concepts, directional drilling plan definition, and drilling technologies in addition to covering the planning process followed by drilling engineers, including initiating a well plan and designing a well. The attendees will also learn the basics of cost estimation processes, fundamentals of well control, drilling tool selection, and the important standards used in the drilling industry.

COURSE CONTENT
- Well construction: Exploration, appraisal, and development drilling
- Drilling rig components and crew roles and responsibilities
- Business of drilling, including well costing and authority for expenditure
- Operational procedures
- Risk management, hazards, and loss-prevention methods
- Drilling fundamentals
- Well design considerations, leasing, contracts, and site preparation to data requirements
- Characteristics of quality well design
- Programming and drilling operations
- Troubleshooting and prevention of common problems
- Well completion options, equipment, perforations, and data-collection tools used for well evaluation
- Well suspension and abandonment procedures

AUDIENCE
Any E&P professional wanting to better understand the principles of drilling.

PREREQUISITE
Engineering degree or equivalent work experience in drilling design or operations.

Rig Awareness and Familiarization
Awareness – 5 Days

This unique course gives attendees an in-depth exposure to drilling rig equipment and its use with classroom instructions on drilling, cementing, and directional drilling concepts and technology. Learning is reinforced by daily trips to an actual drilling rig where attendees see firsthand the rig and drilling equipment used in well construction. Hands-on and classroom lessons are supported by interactive video training that explains the installation and use of downhole equipment and assemblies.

COURSE CONTENT
- Petroleum reservoirs
- Life cycle of petroleum reservoir and reservoir development phases
- Drilling operations, including drilling rig types and their uses, and drilling equipment used on the rig floor and downhole
- Drilling deviated, horizontal, and multilateral wells
- Hands-on visit to a rig to inspect drilling equipment with participation in some rig operations
- Hands-on visit to a cementing and pumping unit to discuss completion, cementing, acidizing, and stimulation topics
- Well life cycle with focus on openhole and cased hole well data
- Hands-on visit to a logging center for an overview of data acquisition for evaluation of well performance

AUDIENCE
Entry-level professionals of all disciplines and nontechnical support staff.

PREREQUISITE
None
Introduction to Drilling

**Awareness – 5 Days**

If you work closely with drilling engineering, operations, or management, this course increases the attendees understanding of the concepts, terminology, and processes used in drilling a well. The course provides a complete overview of the workflow involved in the drilling of oil and gas wells, from office to wellsite. Attendees will also learn the roles and responsibilities involved in a drilling operation.

**COURSE CONTENT**

- Well construction and the role of drilling in the E&P life cycle
- Well design, including planning and engineering, and the data and analysis techniques needed to design a quality well
- Terminology and concepts used in the business of drilling, such as well timing, costs, risks, and authorization for expenditure (AFE) generation
- Drilling equipment explanation: Drilling rigs, bits, casing, and rig floor equipment
- Directional drilling and deviation control equipment and its operation, including unique characteristics of directional drilling
- Wellsite operations: Drilling, logging, casing, cementing, and completions
- Drilling kicks and well control, including well control equipment
- Real-time data collection, monitoring, and interpretation techniques used during drilling operations

**AUDIENCE**

Entry-level professionals of all disciplines and nontechnical support staff.

**PREREQUISITE**

None

Drillbench Blowout Control

**Awareness – 5 Days**

This 3 day course introduces the principles and concepts related to blowout control operations and the use of the Drillbench Blowout software. This course provides an overview of so called tertiary well control options and the engineering calculations required to ensure that a well kill can be achieved. This course also deals with the basics of relief well planning and it deals with dynamic well kill operations for blowout wells.

**COURSE CONTENT**

- History of wild well control
- Blowout Types
- Current Blowout Control Methods
- Fluid Mechanics Of A Blowout
- Relief well planning
- Shallow Gas
- Building the Model and Using The Software
- Blowout paths
- Reservoir flow
- Capping and Capping stacks
- Bullheading
- Momentum Kill
- Relief well Planning
- Intersect
- Relief well kill operations
- Pump and kill schedules

**AUDIENCE**

This course is suitable for drilling engineers, wellsite supervisors and service providers who design, plan and manage drilling operations.

**PREREQUISITE**

The skill level for this course requires a good understanding of the conventional drilling and well construction process. Participants should have a minimum of 5 year drilling related experience and must have an understanding of conventional well control and fluid hydraulics principles.

Petrel Well Design

**Advanced – 1 Day**

The purpose of this course is to introduce the well design module and the drilling functionalities in the Petrel platform. The attendees are guided through the preparation stage for data used in offset well analysis, which includes loading of drilling events, drilling logs, and using end of well reports to filter the knowledge database by, for example, data type, category, or event severity. Attendees will become familiar with the available well design approaches, including an enhanced method also used by drilling engineers. How to import trajectory and targets from third-party applications such as the Landmark EDM will also be introduced. After the planning phase, attendees will learn how real-time data acquisitions are handled in the Petrel platform.

**COURSE CONTENT**

- Drilling event classification and visualization
- Webmap services
- Well design
- Well path design
- Real-time data acquisition

**AUDIENCE**

Drilling engineers, geologists, and petrotechnical personnel with fundamental knowledge in Petrel platform software and who need to understand well path design and optimization within the Petrel platform.

**PREREQUISITE**

Petrel Fundamentals course.

Techlog for Drilling Performance Analysis

**Advanced – 3 Days**

This 3-day course covers the basic theory governing the activity detection and interpretation of the drilling performance analysis and mechanical specific energy (MSE) computations. Backed up with practical examples on actual datasets, attendees will learn the fundamentals of the Techlog platform: project structure and interface, family management, displaying data in both single and multwell applications and a look at the real-time functionality. Then they will learn about the theory and usage behind the Drilling Performance Analysis workflow, including the activity detection and breakdown, as well as interpretation techniques. Finally, there will be an introduction and training on the MSE calculation and interpretation.

**COURSE CONTENT**

- Introduction: project structure and managing data
- Displaying data
### Petrel Reservoir Geomechanics Introduction

**Skill – 2 Days**

This 2-day course introduces reservoir engineers and consultants to some basic concepts in geomechanics and the Petrel Reservoir Geomechanics software product to illustrate how to incorporate data about geomechanical effects into reservoir models of well production behavior. This course also covers the types of data used for geomechanical modelling in the petroleum industry, along with some of the geomechanical effects observed in oil and gas reservoirs and the subsurface during hydrocarbon production. The course discusses how to create reservoir models that show geomechanical effects such as pressure, stress, and strain, as well as data on reservoir flow, how to illustrate the effects over time, and how to build reservoir geomechanical models using Petrel platform.

**AUDIENCE**

Individuals with a need to understand the Techlog interface and data structure

**PREREQUISITE**

Perform data management and quality control

### Drillbench Dynamic Well Control Modeling Software

**Advanced – 2 Days**

This 2-day course teaches the fundamentals of using the Drillbench Presmod Kick software. The course shows the attendees how to enter the required well data and how to run the dynamic well control simulations using the software. The course contains a mix of Microsoft PowerPoint slides and individual hands-on exercises to teach the attendees how to use the software. At the end of the course, the attendees will be able to enter the required well data and run well control simulations using the software.

**COURSE CONTENT**

- Interaction tools
- Real-time functionalities
- Drilling performance analysis introduction
- Drilling performance analysis practicals
- Mechanical specific energy workflow and practicals

**AUDIENCE**

Individuals with a need to understand the Techlog interface and data structure

**PREREQUISITE**

Perform data management and quality control

### Drillbench Dynamic Hydraulics and Temperature Modeling Software

**Advanced – 2 Days**

This 2-day course teaches the fundamentals of using the Drillbench Presmod Hydraulics software. Attendees will learn how to enter the required well data and how to run the dynamic simulations with the software. The course is a mix of PowerPoint slides and individual hands-on exercises to familiarize the attendees in the use of the software. At the end of the course, the attendees will be able to enter the required well data and run simulations using the software.

**COURSE CONTENT**

- Introduction to petroleum geomechanics
- Fundamentals of reservoir geomechanics
- The full Petrel Geomechanics Workflow

**AUDIENCE**

Reservoir engineers and geotechnical consultants with good prior reservoir engineering and Petrel platform knowledge

**PREREQUISITE**

Petrel Reservoir Engineering and ECLIPSE

### Drillbench Dynamic Hydraulics and Temperature Modeling Software

**Advanced – 2 Days**

This 2-day course teaches the fundamentals of using the Drillbench Presmod Hydraulics software. Attendees will learn how to enter the required well data and how to run the dynamic simulations with the software. The course is a mix of PowerPoint slides and individual hands-on exercises to familiarize the attendees in the use of the software. At the end of the course, the attendees will be able to enter the required well data and run simulations using the software.

**COURSE CONTENT**

- Hydraulics and temperature modeling introduction
- Data entry into the software
- Advanced features of the software: Hole cleaning, managed pressure drilling, and dual-gradient drilling operations

**AUDIENCE**

Drilling and fluid (mud) engineers dealing with drilling hydraulics calculations, drilling managers, and drilling supervisors requiring a better understanding of drilling fluid hydraulics.

**PREREQUISITE**

Comprehensive understanding of well design and hydraulics in addition to an understanding of the basics of drilling fluids rheology.

### WELLFLO Underbalanced Hydraulics Modeling

**Advanced – 2 Days**

This 2-day course teaches the fundamentals of using the Neotec WELLFLO® software. Attendees will learn how to enter the required well data and how to run underbalanced and Managed Pressure Drilling simulations with the WELLFLO software. The course is a mix of PowerPoint slides and individual hands-on
exercises to teach the attendees how to use the software. At the end of the course, the attendees will be able to enter the required well data and run simulations using the software.

**COURSE CONTENT**

- Introduction to air-foam and underbalanced hydraulics and multiphase flow modeling
- Advanced features of the software

**AUDIENCE**
Drilling and fluid (mud) engineers planning underbalanced, or air or foam drilling operations.

**PREREQUISITE**
Comprehensive understanding of well design and hydraulics is required in addition to having an understanding of the basics of underbalanced drilling or air and foam drilling.

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**Stuck Pipe and Hole Cleaning - Virtual Seminar**

**Skill – 12 Hours**

This Virtual Instructor Led Training will cover a practical overview of the stuck pipe mechanics, wellbore instability and detail emphasis in hole cleaning conditions, practices, procedures and monitoring. The virtual seminar will include operational practices recommendations to enhance stuck pipe prevention.

Participants rich his practical knowledge through virtual group discussions, revision of real case histories and practical exercises.

**COURSE CONTENT**

- Introduction to highlight some of the most common conditions that might cause a stuck pipe, ended with a practical approach for its management at rig site.
- Revision of solid pack off mechanic, including conditions, warning signs and preventive actions.
- Differential Pressure conditions, warning signs and preventive actions.
- Wellbore Geometry, conditions, warning signs and preventive actions, at the end of the session participants will perform a stuck pipe mechanics exercise.
- Revision of common scenarios in Wellbore Stability, importance of the well planning to reduce Wellbore stability impact
- Hole cleaning conditions, flow regimes and hole cleaning factors
- Hole Cleaning Vertical Holes and Exercise
- Hole Cleaning high angle wells and general practices
- Hole conditions monitoring; surface drilling parameters, Torque and Drag, Annular Pressure While Drilling and integration of measurements
- Recommended Practices for Stuck Pipe Prevention, case history
- Finalizing with detail revision of backreaming practices; pros and cons.

**AUDIENCE**
Drilling Supervisors, Drilling Engineers, Directional Drillers, Petroleum Engineers, Completion Engineers, Real time monitoring Engineers

**PREREQUISITE**
Basic understanding of drilling operations.

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**Deepwater Design and Operations Familiarisation**

**Foundation – 3 Days**

This short course provides an overview of Deepwater Design & Operations. It is intended to provide a general insight into deepwater wells to people who are familiar with conventional offshore wells. Topics are reviewed at an overall level, to ensure that a complete picture is provided, however it is not intended that any topic is explored in depth. New technology applications are mentioned to provide awareness.

**COURSE CONTENT**

- Introduction to Deepwater Drilling
- Deep Water History
- Deepwater Locations and Geology
- Overburden and Compaction, Pore and Fracture pressures
- Metocean & Currents
- Station keeping
- Rig Selection
- Open water Operations (ROV’s)
- Conductors
- Subsea Wellheads and Casings
- Cementing
- BOP Systems
- Drilling Riser Systems
- Drilling Equipment For Deepwater
- Deepwater Well Control
- Drilling Challenges
- Shallow Hazards / Hydrates
- Fluids
- Subsalt
- New Technology; Dual Gradient Drilling, MPD
- Completions & Interventions
- Operations Management

**AUDIENCE**
Internal course for Deepwater business.

**PREREQUISITE**
Basic knowledge of the Oil Industry
## Production Engineering

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with there are some courses that use simulators and are highlighted with.

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<td>Acid Stimulation Techniques</td>
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<td>Hydraulic Fracture Treatment Design and Quality Control</td>
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<td>Fishing, Perforating and other Slickline Applications</td>
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<td>Advanced Nodal Analysis for Production Engineers</td>
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<td>Subsurface Surface Production Optimization</td>
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<td>Practical Well Completions: Downhole Tools and Basic Systems</td>
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<td>Completions and Stimulation Aspects of Shale Plays</td>
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<td>Field Trip and Completions Engineering</td>
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<td>Production Technology - Heriot-Watt University Program</td>
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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Production Engineering

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked 😋 while technical courses that use software have been marked 🟠 and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 🔹. There are some courses that use simulators and are highlighted with 🌟.

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<td>OLGA</td>
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<td>OLGA Advanced Flow Assurance</td>
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<td>OLGA Fluid Handling</td>
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<td>OLGA Well Dynamics</td>
<td>PIPESIM Artificial Lift Design and Optimization</td>
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<td>PIPESIM Gas Field Production Operation</td>
<td>Avocet Administration</td>
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<td>OLGA Flow Assurance (3 days)</td>
<td>PIPESIM Fundamentals</td>
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<td>OLGA Flow Assurance (5 days)</td>
<td>PIPESIM Surface Facility</td>
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<td>OFM Fundamentals Using Canada Data Sources</td>
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Production Engineering

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<td>Well Performance &amp; Completions</td>
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<td>Integrated Production Optimization (virtual course)</td>
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### Electric Submersible Pumps - Advanced

**Advanced – 5 Days**

In-depth instruction focuses on the benefits and limitations of ESPs in challenging production environments. Attendees will learn design of ESP systems for special applications, including production of viscous oil, production of oil with high gas content or solids, and production from dual completions. Hands-on exercises include generation of pump curves (head versus flow rate) for several pump speeds.

**COURSE CONTENT**
- Study of reservoir performance
- Generation of centrifugal pump curves
- Standard and nonstandard applications
- Affinity laws and nodal analysis
- ESP design for highly deviated wells and wells with high-gas content
- Review of viscous fluids and emulsion applications
- ESP troubleshooting
- Techniques for production through annular space and fluids recirculation

**AUDIENCE**
Production professionals involved in production optimization with ESP technology.

**PREREQUISITE**
ESP Applications Engineering course or field ESP experience.

### Fracturing Shales

**Advanced – 5 Days**

The course revisits the concepts of fracturing in sandstones (models, fluids and proppants), introduces the concepts related to fracturing shale formations - geomechanics of shales, models for hydraulic fractures in shales, complexity of hydraulic fractures - and discusses the main concerns related to the completion of horizontal wells. After the course, participants will be able to contribute to the development of shale well completions, participating in multi-disciplinary groups dedicated to the design hydraulic fracturing in these formations.

**AUDIENCE**
- Introduction to the course
- 1st Day Quiz
- History of Fracturing
- Introduction to Fracturing
- Fracturing Methodology
- Hydraulic Fracturing Modelling
- Frac Fluids
- Frac Fluids Additives
- Proppants
- Shale Fluids and Proppants
- Shale Geomechanics
- Brittleness
- In-Situ Stress Testing
- Perforating Horizontal Wells
- Fracture Complexity
- Wiremesh and Unconventional Fracture Models
- Horizontal Justification
- Vertical Wells and Lateral Landing Points
- Horizontal Well Cementing
- Last Day Quiz
- Round Table

### Advanced Well Testing Operations - ELC

**Advanced – 5 Days**

The 5-day course will be held at Schlumberger’s European Learning Center (ELC) training facility in Melun, France. This course is built on the previous practical knowledge assimilated during the Fundamentals of Well Testing Operations class. In each element constituting a well testing operation, the focus is on the aspects of job planning, job design, and safe execution of each component of the operation. This class is mostly classroom based but will include some sessions in the training center pads and workshops. Some software will be used and practiced during this course.

Throughout this course, safety will be a primary focus and participants will be shown HSE best practices that should be implemented during each phase of well testing operations.

**COURSE CONTENT**
- ELC induction and HSE briefing
- Introduction to complex job design (deepwater and HPHT safety considerations)
- Brief introduction to complexities of designing deepwater and HPHT operations
- Well test interpretation advanced
- Introduction to inflow/outflow relationship and nodal analysis
- Basic fluid properties (density, specific gravity, viscosity)
- Hydrocarbon compositions
- Phase envelope and phase behavior
- Pressure versus fluid properties (formation volume factor, gas/oil ratio, density)
- Reservoir fluid classification
- Reservoir sampling and analysis advanced - lab and onsite fluid analysis
- Fluid analysis labs, type of analysis and services they perform
- Special PVT analysis in the lab
- Flow Assurance studies
- Onsite PVT analysis (PVT Xpress, ONYX): principle of operations, benefits, and applications
- Introduction to sampling service delivery procedures and sampling quality assurance (seal selection, high H2S, coated tools, power fluid calculation)
- TCP advanced
- TCP service delivery procedure introduction
- TCP correlation and spaceout

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
IMMERSIVE LEARNING PROGRAMS

## COMPETENCY MANAGEMENT

- TCP SPAN introduction (Schlumberger perforating analysis software)
- DST Advanced
- DST service delivery procedure introduction
- DST job design and DST calculation
- Subsea advanced
- Subsea service delivery procedure introduction
- Offshore subsea equipment preparation and job planning
- Surface well test advanced
- Surface testing service delivery procedure introduction
- Surface well test safety aspects and considerations
- Surface well test advanced
- Job design and preparation
- Creation and edition of piping and instrumentation diagrams
- Architect introduction (well test design and simulation software)
- Surface well test advanced
- Well testing consideration and responsibility
- HAZOP
- Testing data acquisition (TDA) and Vx* multiphase flowmeter advanced
- Data acquisition reporting and transmission (DART) introduction plus real-time connectivity, collaboration, and information service InterACT* service
- Gauges job design
- Vx advisor introduction - multiphase flowmeter validation software
- Q & A session
- Evaluation
- Round table and wrap up

### AUDIENCE
Reservoir engineers, production engineers, petroleum engineers, production supervisors and others with a need for advanced understanding of well testing job planning, job design, and safe job execution

### PREREQUISITE
Fundamentals of Well Testing Operations course or a thorough understanding of the practical aspect of well testing operations.

### Production Data Analysis: Shale Gas, Tight Gas, and Coal-Bed Methane

#### Advanced – 3 Days

This course is designed to implement a comprehensive learning module of production data interpretation and analysis, including the principles of production fundamentals, technologies, and workflows with applications and field examples for unconventional recourses. Production analysis requires handling and conditioning large volumes of multiple source, multiple frequency data, identifying and synchronizing events, and assigning the appropriate production rate to each event. These critical steps enable production engineers to make efficient interpretation and analysis of the data and to optimize well productivity using advanced methodologies.

### COURSE CONTENT
- Science: Foundational understanding of principles and governing factors of production
- Technologies: Exposure to sensor technologies and tools necessary for data conditioning
- Workflows: Skills to apply methodologies and workflows to enable data interpretation and analysis

### AUDIENCE
Practicing reservoir, production, and facilities engineers and engineering and asset managers.

### PREREQUISITE
4-year geoscience/engineering degree.

### Assuring Flow from Pore to Process

#### Advanced – 3 Days

From this course on flow assurance, attendees will gain an advanced understanding of fluid flow through a series of interconnected systems from the reservoir to surface facilities, and the prevention and mitigation of common flow impediments. The attendees will learn best practices from worldwide field examples, as well as how to design fit-for-purpose flow assurance solutions.

### COURSE CONTENT
- Key flow assurance issues
- Technologies for capture and characterization of fluid samples
- Methodologies for measurement, modeling, and management of inorganic and organic solids
- Fluid flow and heat-transfer characteristics and their importance in design of subsea architecture, model selection, and liquids management
- Processes of fluid flow integration, heat transfer, and solids

### AUDIENCE
Engineers and technical staff responsible for well surveillance, production optimization, or completion design.

### PREREQUISITE
Working knowledge of well production behaviors, basic reservoir engineering principles, and surface facilities; exposure to well completion design, nodal analysis, and stimulation processes.

### Full Life Cycle Fluid Evaluation: Downhole to Laboratory

#### Advanced – 5 Days

Advanced-level instruction focuses on technologies for characterization of reservoir fluids in situ and methods for capture of a representative sample. Attendees will learn the importance of proper sample handling and the procedures that define fluid properties (vapor-liquid equilibrium phase envelopes, gravimetric fluid properties, and hydrocarbon solids) and rheological transport characteristics. Hands-on demonstrations include developing mathematical models using EOS for fluid PVT analysis, and hydrocarbon solids phase boundaries for applications in reservoir simulations, production modeling, and surface processing.

### COURSE CONTENT
- Physics of reservoir fluids, including origin of fluid gradients, and reservoir compartmentalization
- Downhole fluid-analysis technology: Monitoring mud-filter contamination, live fluid analysis, component analysis, and in situ analysis
- Sample quality control and reservoir characterization workflow examples
- New developments in EOS for fluid PVT analysis
- Methods for determining reservoir connectivity
- Openhole sampling technologies, including MDT tester
- Visit to a technology or operations center for physical demonstration of downhole sampling and analysis tools (location dependent)
• Cased hole sampling during well or production testing and laboratory fluid characterization technologies
• Workflows to develop thermodynamic and transport characteristic models
• Fundamentals of lab characterization of hydrocarbon solids (asphaltnene, wax, hydrate)
• Visit to fluids and flow assurance analysis center for physical demonstration of equipment and measurement methods (location dependent)

AUDIENCE
Members of multidisciplinary teams, including petrophysicists and engineers, who need an advanced understanding of fluid properties from sample acquisition to modeling.

PREREQUISITE
Strong understanding of fluid property principles and modeling.

Advanced Production Data Analysis and Nodal Analysis

Advanced – 5 Days

In this course, attendees will learn how to predict theoretical well production rates using well measurements and how to identify constraints that impact performance in the reservoir, completion, and wellbore system. The attendees will also learn how to analyze production data to find permeability, skin factor, and drainage area and to forecast future performance based on historical production trends and known reservoir properties.

COURSE CONTENT
• Inflow performance in oil wells
• Transient inflow performance relationship curves
• Pressure drop across the completion
• Systems analysis graph
• Production data analysis
• Transient flow
• Material balance for various reservoirs
• Transient versus steady-state flow
• Estimates of skin factor and permeability from transient flow
• Estimates of drainage area from pseudosteady-state flow

AUDIENCE
Reservoir and production engineers involved in improving field performance through identification and remediation of underperforming wells.

PREREQUISITE
Solid understanding of steady-state and pseudosteady-state forms of Darcy’s law; basic understanding of well test analysis, including ability to identify the early and middle time regions on a log-log plot; Horner graph analysis (for permeability and skin factor).

Advanced Gas Lift Design & Troubleshooting

Skill – 5 Days

This course will help the attendees learn the best method for selecting the proper type of artificial lift. The course will provide the attendees with details on gas lift systems and different design methods, in addition designing the valve spacings and basis for selecting different valves. The course will also introduce the optimum unloading procedures for gas lift wells to minimize risk and save operation time and how to optimize the gas lift well production and combine continuous and intermittent gas lift systems. Troubleshooting new and old gas lift wells will be covered in the course through the use of case examples.

COURSE CONTENT
• System nodal analysis
• Multiwell systems
• Artificial lift methods, advantages, and limitations
• Gas lift technology and process
• Types of gas lift systems
• Gas lift equipment
• Fundamentals of gas lift design
• Troubleshooting gas lift wells
• Production optimization

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
AUDIENCE
Production engineers, managers, and production technicians (office and fields) who have experience with artificial lift and gas lift systems.

PREREQUISITE
None

Workovers and Completions
Skill – 5 Days

Learn the role of engineers and field operators in planning and executing workover operations. This course provides in-depth information on the impact of workovers and completion design in maximizing field production and increasing recoverable reserves. The course also emphasizes the importance of a team concept as a determining factor in operations success. Attendees will gain a greater understanding of how to apply advanced technologies to designing and executing workover jobs, and how to select the best operations method to perform the task in the safest, most efficient manner.

COURSE CONTENT
• Workover and completion methodology: Risk management, well problems, and well control
• Completion considerations: Cement bond logs, perforations, and fracture gradient
• Sand control management, cement squeeze jobs, and acid treatments
• Rigless workovers, coiled tubing operations, and fishing
• Completion management, operations in open and cased holes, and artificial lift systems

AUDIENCE
Engineers, operations personnel, and managers working with or directing multidisciplinary teams responsible for well workovers or interventions.

PREREQUISITE
Minimum of 5 years of experience in oil and gas engineering or operations in the upstream industry.

High Gas/Oil Ratio Well Liquid Unloading
Skill – 5 Days

The course provides attendees with a basic understanding of gas well liquid unloading, including the use of standard artificial lift technology to assist in unloading and in alternative foaming agent methods. The attendees will use practical examples to enhance your understanding of the gas well liquid unloading processes.

COURSE CONTENT
• Hydrocarbon physical properties: Two-phase flow basics
• Well inflow performance
• Nodal analysis
• Artificial lift selection
• Sucker rod pumps
• Progressive cavity pumps
• Electric submersible pumps
• Gas lift
• Gas well liquid unloading applications: Intermittent gas lift, plunger lift, velocity strings, and injection of surfactants (foaming agents)

AUDIENCE
Anyone involved in gas production treatment, handling, or marketing who wants to understand high gas/oil ratio wells.

PREREQUISITE
Basic understanding of well completions and operations.

Acid Stimulation Techniques
Skill – 5 Days

This course covers the cause and identification of formation damage during drilling, cementing, perforating, producing, and workover operations. Attendees will learn about the impact of formation damage on well performance and how to gauge the effectiveness of acid stimulation treatments, technically and economically.

COURSE CONTENT
• Formation damage mechanisms and their identification
• Skin
• Acids and additives used in matrix stimulation
• Acid reactions in carbonates and sandstones
• Acid treatment design
• Acid displacement
• Laboratory tests
• Acidizing gravel packs
• Acid fracturing design
• Quality assurance

AUDIENCE
Technical staff responsible for assessing underperforming wells or designing acid treatments.

PREREQUISITE
Basic understanding of petroleum engineering.

Hydraulic Fracture Treatment Design and Quality Control
Skill – 5 Days

This course presents the basic principles of hydraulic fracture treatment design and optimization, including application of fracture models. Focus is on the use of a pseudo-3D fracture simulator to design the optimal treatment pumping schedule for both low- and high-permeability wells. Attendees will learn how to select the appropriate fluid and proppant for specific reservoir conditions and field operations, and how to establish quality control for treatment operations.

COURSE CONTENT
• Critical parameters in hydraulic fracture treatment design
• Fracture modeling
• Fracture optimization
• Fracture fluids and proppants
• Minifrac analysis
• Fracture treatment execution
• Fracture treatment evaluation
• Supervision of fracturing operations

AUDIENCE
Engineers and field personnel responsible for the design and execution of hydraulic fracture treatments.
### PREREQUISITE
Basic understanding of production, intervention operations, and reservoir engineering.

### Introduction to High-Temperature ESP Applications
**Skill – 2 Days**

This course is designed to provide an introduction to the ESP and its applications in high-temperature environments. The specific functions of the ESP components are covered in this course in addition to basic application engineering principles, operating practices, and troubleshooting. The ESP is considered to be an effective and economical means of lifting large fluid volumes from significant depths under a variety of well conditions. Experience gained over many years of ESP operation and the continuous evolution of technology has expanded the operational capabilities of ESPs. In particular, ESPs are widely used for the production of fluids from steam-assisted gravity drainage (SAGD) well pairs and other applications that require a reliable pumping system in high-temperature wellbores. Knowledge gained in the classroom is reinforced with practical demonstrations of the technology and components in the workshop by observing actual equipment being assembled and tested.

**COURSE CONTENT**
- ESP overview
- Component review
- Pumps
- Intakes and gas separators
- Motor, protector, and power cables
- Electrical surface equipment
- High-temperature technology
- Application Engineering and ESP design
- Operation and troubleshooting
- Dismantle inspection failure analysis

**AUDIENCE**
Engineers, field supervisors, operators, and electricians involved in the application and operation of ESPs.

**PREREQUISITE**
Basic knowledge of production engineering, operator experience, and/or field electrical experience.

### Fishing, Perforating and other Slickline Applications
**Skill – 5 Days**

This course takes a practical approach to special slickline applications and detailed descriptions of downhole tools. Included in the course are procedures and tools for fishing and perforating, types of landing nipples, shifting tools, plugs, circulating devices, procedures, and kickover tools for installing/retrieving GLM valves, and subsurface safety valves.

**COURSE CONTENT**
- Review of basic slickline tools and operations
- Shifting tools
- Circulation devices
- Gas lift tools and valves
- Subsurface safety valves
- Slickline hardware review
- Running plugs and safety valves

**AUDIENCE**
Slickline operators and supervisors, as well as other personnel involved in slickline operations.

**PREREQUISITE**
Familiar with well interventions and rigless interventions in general and in particular, with slickline operations.

### Fundamentals of Well Testing Operations - ELC
**Skill – 5 Days**

The 5-day course will be held at Schlumberger’s European Learning Center (ELC) training facility in Melun, France. It will consist of theoretical classroom sessions with presentations of well testing equipment, procedures, and operations. The participants will have practical exposure sessions using the well testing flow loop and hands-on sessions with various well testing tools in the training center. It is anticipated that the course will be 50% classroom and 50% practical on the various training pads and workshops at ELC.

The course includes an introduction to well testing equipment and the instrumentation required to control, monitor, measure, and sample reservoir fluids produced during a typical well test. Participants will gain an understanding of the primary objective of surface and downhole well testing, and a major focus will be to develop a thorough understanding of safe handling practices of the produced effluents (solids, liquids and gases) at high pressures and temperatures. Safety is a primary focus, and participants will be shown HSE best practices that should be implemented during each phase of well testing operations.

**COURSE CONTENT**
- ELC induction and HSE briefing
- Introduction to testing services
- Overview of the complete testing cycle
- Well testing objectives
- Well test interpretation
- Permeability
- Description of fluid flow in porous media (pressure diffusion)
- Pressure versus flow rate relationship (Darcy equation/linear-radial)
- Skin
- Pressure versus flow rate relationship (diffusivity equation)
- Example: pressure/flow rate versus time data and flow periods
- Log-log graph (early-middle-late time)
- Boundary types and derivative behavior
- Data matching for determining reservoir and boundary properties
- Introduction to TCP
- Perforating principle
- Gun system description and selection
- Firing heads and accessories
- TCP workshop
- Introduction to DST
- DST workshop
- Introduction to subsea operations
• Explanation of subsea operations
• Subsea tools overview
• Reservoir fluid sampling and analysis
• Downhole sampling operations: cased hole and open hole
• Onsite fluid analysis with wellsite chemistry: methods, major equipment, and applications
• Surface fluid sampling: separator and wellhead sampling, phase sampler
• Reservoir fluid sampling and analysis workshop visit
• Demonstration of downhole sampling equipment in the ELC workshop and principle of operations
• Demonstration of wellsite chemistry equipment
• Demonstration of Separator Sampling points and principle of operations
• Introduction to surface testing and well test parameters
• Equipment introduction: selection and testing procedures/standards introduction
• Basic well test operations and processes
• Surface well test
• Well test practical introduction
• Practical simulation of a well test
• Testing data acquisition (TDA) and multiphase flowmeter (Vx) theory
• Introduction to TDA
• Introduction to Vx
• TDA and Vx practical
• Q & A Session
• Evaluation
• Class evaluation
• Round table and wrapup

AUDIENCE
Reservoir engineers, production engineers, petroleum engineers, production supervisors and others with a need for practical understanding of well testing operations

PREREQUISITE
Prior knowledge of basic well testing operations and well testing interpretation

Electric Submersible Pumps: Application Engineering
Skill – 5 Days

Designed for technical staffs who want both theoretical and practical knowledge about the advantages and limitations of ESPs, this course includes design, optimization, and diagnosis of wells producing with ESPs. Attendees gain a solid understanding of ESP technology and its applications, as well as of the pump components and their functions. Specific instruction is given on the affinity laws for centrifugal pumps, downhole gas separators, and gas handlers. Reviews include both standard and nonstandard applications of ESP technology.

COURSE CONTENT
• Review of artificial lift systems
• Standard and nonstandard ESP applications
• Reservoir dynamics: Inflow performance relationship and total dynamic head
• Description of downhole equipment
• Pump selection and dimensioning

• Physical limits
• Nodal analysis
• Surface equipment
• Alternatives to standard means of deployment

AUDIENCE
Technical staff involved in production optimization using ESP technology.

PREREQUISITE
Basic understanding of production engineering, production field experience, or experience with ESPs.

Formation Damage and Mitigation
Skill – 5 Days

This course covers formation damage mechanisms and the methods used for mitigation. Also included are the topics of matrix treatments and hydraulic fracturing. The damage mitigation in carbonates is also presented with an overview of acidizing.

COURSE CONTENT
• Introduction
• Problem diagnosis and well intervention
• Acidizing candidate selection
• Fracturing high-permeability formations
• Acidizing carbonates

AUDIENCE
Production, drilling, reservoir engineers, and other field personnel who require an introduction to wellbore damage mechanisms and mitigation methods.

PREREQUISITE
Bachelor degree in a technical discipline. Oilfield operations experience is not essential but would be beneficial.

Advanced Nodal Analysis for Production Engineers
Skill – 5 Days

Based on data from a material balance or the actual well production, this course helps attendees learn how it is possible to predict the future production behavior of a well as a function of time. The course will also help the attendees in the proper selection of design variables such as tubing sizes, or in making the decision to install or not any particular artificial lift system. Unlike conventional nodal analysis, all decisions from a sensitivity analysis are carried out and planned in the future in consideration of the reservoir pressure changes that occur with time.

COURSE CONTENT
• Diffusivity equation
• Diffusivity equation solutions
• Production system analysis
• Well performance equations for oil and gas wells
• Well completion effects
• Multiphase flow analysis
• Sensitivity analysis using conventional nodal technique
• Forecast well production performance
• Decline curve analysis types
• Suitable production system design
**Advanced Slickline Operations**

**Skill – 5 Days**

The course consists of theoretical sessions in the classroom delivered by experienced professionals who will present slickline tool principles and operations. The attendees will also have various practical exposure sessions using the slickline well/pad and having hands on sessions using the slickline tools in the workshop. This course consists of 50% classroom and 50% practical in the workshop and wellsite pad, including access to an actual well.

**COURSE CONTENT**

- Pressure control equipment
- Gas lift equipment
- Fishing and other slickline applications

**AUDIENCE**

Technicians, supervisors, or engineers with previous slickline experience.

**PREREQUISITE**

Familiarity with slickline applications, equipment, and operations. Attendees must have worked with Slickline Operations, either as equipment operators or as operations supervisors.

**Subsurface-Surface Production Optimization**

**Skill – 5 Days**

From this overview of the production system from reservoir to separator, attendees learn to optimize the process using an integrated approach, including nodal analysis and identification of major pressure losses. In hands-on in-class exercises, the attendees will use specialized software to identify constraints and propose recommendations for production optimization.

**COURSE CONTENT**

- Overview of production system from reservoir to surface: Production system and process, well completions, lift methods, gathering systems, and separation systems
- Nodal analysis: Main pressure-drop components, inflow performance relationship, completion, tubing system graph, and gas well production behavior
- Subsurface-surface production operation: Integrated vision, procedures, best practices, identification of restrictions and corrective actions, production optimization using automation technology, and performance management
- Integrated production systems, software and tools focusing on performance modeling, technology trends, and integrated information management for control, monitoring, and automation

**AUDIENCE**

Engineers responsible for production optimization and tasked with evaluating a subsurface network and surface system as one integrated system.

**PREREQUISITE**

Knowledge of the production system from subsurface to surface.

**Sucker Rod Pumps—Application Engineering**

**Skill – 5 Days**

This course will allow the attendants to acquire a solid knowledge of sucker rod pumps (SRP), their applications, and a detailed description and function of each SRP component. The basics of reservoir inflow performance, artificial lift systems, standard and special applications, system components, design, diagnosis, troubleshooting, and optimization are also presented. A set of practical examples and problems are solved in class. The SRP is considered to be the most popular artificial lift method worldwide. Its applications include low-downhole pressure wells, slim holes, multiple completions, high-temperature, and viscous oil. The SRP companies have improved the operation of the entire system, including pumpoff controllers, improved gas separation, gas and solids handling pumps, and optimization using surface and bottomhole cards. Because of its wide operation range and adaptability to other wells with minimum cost make the SRP become an economically attractive solution for oilfield development.

**COURSE CONTENT**

- Oil production introduction, basic definitions, concepts, and role of artificial lift systems
- Artificial lift systems overview
- Well inflow performance
- Advantages and limitations of the SRP method
- Descriptions and functions of surface equipment
- Descriptions and functions of subsurface equipment
- Calculation and sizing using recommended practices API RP 11L method.
- Description and analysis of the rod string behavior
- Comprehensive design and selection of subsurface and surface components
- Comprehensive discussion and analysis of dynamometer cards
AUDIENCE
Production engineers, technologists, and others involved in production optimization; specifically, individuals who want to gain more SRP knowledge.

PREREQUISITE
None

**Sand Control**
Skill – 5 Days

To increase your understanding of sand control, this course encompasses sand control concepts and design as well as methodologies for selection of optimal techniques. Attendees will learn best practices for sand control in horizontal drainholes and water injectors, sand management, quality control procedures for job execution, and postjob evaluation.

COURSE CONTENT
- Basic rock mechanics
- Sand prediction
- Methods for sand control
- Sand management
- Gravel-pack design
- Screenless methods
- High-rate water pack
- Frac pack
- Sand control job execution and evaluation

AUDIENCE
Engineers responsible for sand control design and execution.

PREREQUISITE
Engineering degree or equivalent experience with sand control operations.

**Electric Submersible Pumps - Application Engineering - Practical Training**
Skill – 9 Days

The class will be welcomed to the training course. This will include a brief outline of the history of the course and the main areas that will be reviewed. An overview of the training will be discussed with participants to determine if the agenda meets the needs of those attending the training. The goals and objectives of each client will be recorded to ensure the training meets expectations. If there are some requests not covered in the agenda, where possible, the agenda will be adjusted to accommodate additional requests.

COURSE CONTENT
- Introduction / orientation / Welcome
- HSE
- Artificial Lift Review
- ESP Equipment
- Tour of Plant
- Quality Labs
- Foundry & Finishing
- Equipment Assembly; Pump, Intake, Protector and Motor
- Testing Area

**Acidizing Sandstones and Carbonates**
Skill – 5 Days

- Welcome and Introduction
- Candidate selection for matrix treatments
- Damage mechanisms
- Skin effect
- Comparison of objectives of matrix treatments in carbonates and sandstones
- Chemistry of carbonate acidizing
- Fluid selection for carbonate acidizing
- Chemistry of sandstone acidizing
- Fluids selection for sandstone acidizing
- Additives used in acidizing and their functions
- Placement techniques
- Laboratory testing
- Job design
- Open discussion
- Problem solving

AUDIENCE
Engineers, geoscientists and other field personnel responsible for the design, execution or supervision of matrix treatments

PREREQUISITE
Engineering, technology or other science related degree

**Perforating**
Skill – 5 Days

This 5-day course is a comprehensive overview of perforating technologies and applications related to different types of formations and well completions. The course selection of charges, deployment of guns, and techniques to perforate, decrease damage, and optimize production.

COURSE CONTENT
- Introduction
- First- day quiz
- Introduction to perforations
- Explosives history and shaped-charge technology
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Shaped-charge design
- Hardware
- Tubing-conveyed perforations (TCPs)
- Completions without killing
- CleanPerf
- Geomechanics for perforating
- API Standard RP19B (2nd Edition)
- Perforating carbonates
- Fracturing process and Perforating Methodology
- High-energy fracturing applications
- Perforating injectors
- Perforating weak sands (for sand control and sand prevention)
- Perforating for production optimization
- Propellants
- Last day quiz
- Round Table

AUDIENCE
Production, completion, and drilling engineers and other personnel involved in perforating and other completion technologies (fracturing and sand control)

PREREQUISITE
General knowledge of well completions and well interventions

Completions and Stimulation Aspects of Shale Plays

Skill – 5 Days

This course will introduce the audience to the engineering methodology of completing organic shale reservoirs. The fundamentals of hydraulic fracturing are reviewed. Designing and completing hydraulically fractured horizontal wells for optimum productivity is the focus of the course. Various measurement techniques to employ in the completion optimization exercise are reviewed. Classroom exercises to select lateral landing points, design perforation strategies, place perforations and design stimulation stages, determine fracturing fluid formulations are employed in order for the student to gain a personal understanding of the impacts of these parameters on stimulation effectiveness.

COURSE CONTENT
- Fundamentals of hydraulic fracturing
- Rock mechanics, fracturing fluids and additives, proppants
- Hydraulic fracture design for tight sands
- Stress profiles, impact of tectonics, pore pressure
- Modeling of fracture geometries
- Hydraulic fracture design for organic shales
- Complex fracture geometries, impact of anisotropy
- Horizontal wells
- Justification, design, construction, measurements
- Completion systems, cementing, perforating
- Fluids, additives and proppants for organic shales
- Horizontal well completion design
- Fracture staging, perforation placement
- Horizontal well hydraulic fracture design
- Impact of stress anisotropy and natural fractures
- Hydraulic fracture spacing, complexity prediction and modeling
- Evaluation of fracture stimulation treatments
- Microseismic monitoring, tracer technologies, flowback analysis

AUDIENCE
Engineers and Geoscientists selected by Saudi Aramco to participate in the Shale Plays training program

PREREQUISITE
None

Completion and Production Engineering

Skill – 5 Days

This course covers the role of the well, how its production performance can impact the larger integrated production system, and considerations for completion design. Attendees will learn the selection criteria for the main completion components, including the field operational and ongoing production management concerns. Hands-on exercises demonstrate the factors that affect well flow behavior and productivity.

COURSE CONTENT
- Integrated production systems: Completion methods, engineering, exploitation, and reservoir classification based on the fluid types
- Flow behavior: Flow in porous media, well deliverability, completion effects, flow in pipes, choke performance, and systems analysis
- Design considerations: Tubing, tubing loads and movement, tubular connections, and casing
- Equipment selection: Completion equipment, casing and casing suspension, wellheads, tubing and connections, packers, and wellsite operations
- Subsea completions: Current systems, applications, design requirements, controls, flowline connections, and remotely operated vehicles

AUDIENCE
Engineers and Geoscientists selected by Saudi Aramco to participate in the Shale Plays training program

PREREQUISITE
None

Matrix Stimulation Carbonates

Foundation – 5 Days

The 5-day workshop consist of lectures and work sessions directed at improved treatment success and well performance. Participants will be brought up to date on the latest chemical, mechanical and software technology. Each lecture will discuss state-of-the-art technology with emphasis on field applications and case histories followed by a work session to emphasize the ”every-day” practical application of the technology. During the workshop you will learn how to select good Matrix candidates, characterize the damage, optimize a treatment, evaluate treatment economics, provide QC, evaluate real-time skin evolution, and perform post-treatment evaluation.

COURSE CONTENT
- Welcome/Introduction
- Operator Presentations: Field Overview and Matrix Practices/Challenges
- Introduction to Matrix Stimulation Engineering: Keys to Success

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Matrix Additives: Types/Application/Selection
Carbonate Acidizing: Reaction Rate/Kinetics, Fluids Selection, Design & Software Modelling
Placement and Zone Coverage: Diversion
Matrix Treatment Design Methodology
Laboratory Workshop (1/2 Day)
Carbonate Design Workshop: Vertical Well
Vertical Well Workshop Presentation
Matrix Design/Evaluation Software
Horizontal Well Matrix Stimulation
Carbonate Design Workshop: Horizontal Well
Horizontal Well Workshop Presentation
Treatment Evaluation
Conclusions

**AUDIENCE**
Engineers, Managers, Researchers, Geologist, and Field Supervisors involved in design, execution, evaluation and/or approval of Matrix treatments.

**PREREQUISITE**
Basic concepts of oil and output and general knowledge of well intervention.

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**Production Technology: Heriot-Watt University Program**

**Skill – 5 Days**

In this course, attendees will gain an insight into the role of the production engineer, well productivity fundamentals, and basic operational issues. Course material introduces production technologies as an aid to the field development process and explains important concepts in reservoir and well productivity optimization.

**COURSE CONTENT**
- Introduction to production technology, reservoir production concepts, reservoir-drive mechanisms, and composite production systems
- Inflow performance relationship, tubing performance relationship, and flow through chokes
- Wellbore completion concepts, multiple-zone completions, and completion equipment
- Wireline services, perforation systems, and completion practices
- Well intervention, well problems, and well abandonment
- Advanced well systems

**AUDIENCE**
Technicians, supervisors, or engineers with little or no previous oilwell operations knowledge.

**PREREQUISITE**
None

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**Artificial Lift Technology**

**Foundation – 5 Days**

This introductory course will increase the attendee’s knowledge of artificial lift methods and the factors that affect optimal designs and operations, including fluid properties and multiphase flow regimes. An overview of lift techniques, technologies, and equipment also covers alternate deployment scenarios and multisensor applications for surveillance and optimization. Attendees will learn strategies and best practices for field production optimization and when and how nodal systems analysis can be applied to lift performance optimization.

**COURSE CONTENT**
- Fluid flow fundamentals
- Blackoil PVT
- Inflow performance
- Nodal analysis
- Comparison of artificial lift methods
- Progressive cavity pump systems
- Beam pump systems
- Electrical submersible pump systems
- Gas lift systems
- Artificial lift selection

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**Integrated Production and Well Operations Modeling Using a Physical Simulator**

**Foundation – 5 Days**

In this course, an oil well simulator is used to detail many of the operations that take place in a well. This course/workshop consists of theoretical (50%) and practical (50%) sessions with experienced professionals. The attendees will simulate the operation of different artificial lift systems used to produce oil (electric submersible pumps [ESP], gas lift, progressive cavity pumps) under several operating conditions and their effects on the production system. Water and air are used to simulate two-phase flow (oil and gas). The standard configuration of the oilwell simulator uses an ESP with a variable speed drive, allowing for variation of the pump speed. This feature is used to optimize production and well performance. A workover operation can be performed by changing the artificial lift system from ESP to gas lift. The configuration of the oilwell laboratory allows for visualization of the reservoir, wellbore, flow lines, choke performance, and most common artificial lift systems. Additionally, the effects of damage removal, pump speed, gas injection rates, and down hole pressure can be analyzed to generate optimization opportunities.

**COURSE CONTENT**
- Oilwell operations
- Inflow performance relationships
- Permeability
- Nodal analysis
- Well completions
- Choke
- Artificial and gas lift
- ESPs
- Hydraulic pumps
- Fluid flow
- Formation damage
- Fluid mechanics

**AUDIENCE**
Technicians, supervisors, or engineers with little or no previous oilwell operations knowledge.

**PREREQUISITE**
None
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

AUDIENCE
Anyone involved with well surveillance, maximizing recovery, or identifying production problems in artificially lifted wells.

PREREQUISITE
None

Fundamentals of Slickline Operations

Foundation – 5 Days

This 5-day course comprises theoretical sessions in the classroom with experienced professionals who deliver presentations on the tools and operations. Participants will also have various practical exposure sessions using the slickline well/pad and hands on sessions using slickline tools in the workshop. The class will be 50% in classroom and 50% practical in the workshop and wellsite pad, including access to an actual well.

The course will include a detailed introduction to slickline equipment and instrumentation used to control, condition, and monitor downhole operations. It will provide a clear understanding of the primary operations and need for slickline in the oil and gas industry. Topics covered include

- Slickline unit
- Pressure-control equipment
- Toolstring components
- Running and pulling tools
- Locks, standing valves and landing nipples
- Flow control equipment
- Running, setting, equalizing, and pulling process
- Shifting tools
- Service and remedial tools
- Changing gas lift mandrels (demonstration)
- Running in well

COURSE CONTENT

- History of slickline
- Well Completion theory
- Slickline units and powerpacks (zones) - theory
- Weight and depth indicators - theory
- Wire (type -tests - log books) - theory
- Pressure control equipment - Theory
- Basic toolstring components/upstroke jars - theory
- Basic service and remedial tools - theory
- Running and pulling tools - theory
- Locks, standing valves, and landing nipples - theory
- Baker/Otis/Camco/PCE flow control equipment - theory
- Running, setting, equalizing, and pulling process - theory
- Gas Lift theory
- SCSSV’s theory
- Wire testing practicals
- Pressure control equipment - practical
- Basic toolstring components/upstroke jars - theory Pulling tools - Practical
- Shifting tools - practical

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PREREQUISITE
Basic knowledge of oil and gas well drilling and operations

**Practical Perforating I: Shaped-Charges, Guns and Operations**

*Foundation – 1 Days*

This 1-day overview course introduces oilwell perforating concepts, operations, gun systems, and safety. It familiarizes attendees with tools, equipment, processes, and procedures, including the basics of shaped-charge design and manufacturing, qualification and quality-control tests, perforating laboratory research, and applications in various well completions and different types of formations. The agenda comprises lecture presentations, technical animations and videos, and facility site tours at a Houston-area research, technology integration, engineering, and manufacturing center to view equipment displays, models, manufacturing operations, quality-control tests, and demonstrations.

**COURSE CONTENT**
- Explosives, oilwell perforating, and conveyance methods
- Shaped-charge components, materials, and types
- Gun, or carrier, system classifications
- American Petroleum Institute (API) qualification tests
- Shaped-charge manufacturing
- Inspection testing for quality-assurance and quality-control
- Downhole pressures: underbalance, balanced, or overbalance
- Dynamic versus static underbalance
- Extreme overbalance and propellants
- Perforating research and laboratory testing
- Firing heads, detonators, and accessories
- Explosive cutters for pipe recovery
- Operational safety and examples of perforating applications

**AUDIENCE**
Production and completion engineers and other professionals with a need for practical knowledge of perforating technology

**PREREQUISITE**
Basic knowledge on oil and gas well completions and production.

**Introduction to Coiled Tubing Operations**

*Foundation – 5 Days*

The 5-day course provides overviews of coiled tubing (CT) equipment, manufacturing, and applications, including operations performed with nitrogen.

**COURSE CONTENT**
- CT equipment and well control
  - Introduction to CT services
  - Basic CT equipment
  - Well control equipment
  - CT pipe manufacturing
  - CT string and pipe management
  - Data acquisition
  - Visit to Schlumberger base
- Depth control
- Introduction to CT applications
- Matrix stimulation with CT
- Blaster system
- CT logging, fill cleanout and job design
- Introduction to CT logging
- Fill cleanout
- Introduction to job design
- Safety and operational standards
- Job design - risk analysis and modeling
- Tools
  - Introduction to downhole tools
  - New technology tools
  - Visit to tools workshop at Schlumberger base
- Nitrogen
  - Applications
  - Safety
  - Exercises
- End-of-course quiz
- Round table

**AUDIENCE**
Engineers and technicians with a need to learn the fundamentals of CT operations

**PREREQUISITE**
Basic knowledge of oil and gas well operations and well interventions

**Practical Hydraulic Fracturing**

*Foundation – 3 Days*

This practical 3-day course is designed to increase hydraulic fracturing knowledge. The training materials are covered through classroom presentations, supported by examples, case studies, lab demonstrations, and a visit to the stimulation pad. Soft copies of the training material are given to audience for future reference. The goal of the course is to increase the participant’s knowledge of stimulation services, to understand service-specific technical design, and operational considerations.

**COURSE CONTENT**
- Introduction to stimulation and formation damage
- Candidate selection
- Acidizing basics
- Fracturing fundamentals
- Fracturing fluids and proppants
- Fracturing equipment
- Multistage stimulation system
- Operations safety considerations
- Frac equipment tour - Practical Session
- Horizontal well optimized completions in unconventional reservoirs
- Channel fracturing technology
- Microseismic applications for fracturing evaluation
### Matrix Stimulation Engineering

**Foundation – 5 Days**

The 5-day workshop consists of lectures and work sessions designed to improve treatment success and well performance. The latest chemical, mechanical, and software technology will be covered. Each lecture includes a discussion on state-of-the-art technology with emphasis on field applications and case studies, followed by a work session to emphasize the every-day practical application of the technology. During the workshop, participants will learn how to select good matrix candidates, characterize the damage, optimize a treatment, evaluate treatment economics, provide QC, evaluate real-time skin evolution, and perform post-treatment evaluation. Attendees are encouraged to bring information on a well they are interested in evaluating.

#### COURSE CONTENT
- Welcome/introduction
- Operator presentations: field overview and matrix practices/challenges
- Introduction to matrix stimulation engineering: keys to success
- Matrix design/evaluation software
- Candidate selection process: production prediction/stimulation technique selection
- Formation damage characterization and removal
- Sandstone acidizing: fluids and design
- Matrix additives: types/applications
- Placement and zone coverage: diversion
- Matrix stimulation laboratory
- Design methodology/workshop
- Matrix software demonstration: design and economics
- Job preparation and quality assurance
- Treatment evaluation
- Carbonate acidizing
- Horizontal well matrix stimulation
- Design workshop
- Design workshop presentations
- Roundtable discussion
- Discussion on specific well problems

#### AUDIENCE
Engineers, managers, researchers, geologists, and field supervisors involved in design, execution, evaluation, and/or approval of matrix treatments.

#### PREREQUISITE
General knowledge of well intervention and basic concepts of well production and well productivity.

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### Hydraulic Fracturing

**Foundation – 5 Days**

Designed to increase your understanding of hydraulic fracturing, the course material covers factors that contribute to successful fracturing operations, including rock properties and treatment design and parameters. Attendees will learn how to plan and execute the job, and then evaluate the results.

#### COURSE CONTENT
- Candidate selection
- Principles of rock mechanics
- Fracture mapping, microfracturing testing, minifracturing testing
- Designing hydraulic fractures
- Fracturing fluids
- Proppant
- Fracturing high-permeability formations
- Planning and executing fracturing operations
- Evaluating hydraulic fracture treatments
- New developments in hydraulic fracturing

#### AUDIENCE
Engineers and field personnel responsible for the design and execution of hydraulic fracture treatments.

#### PREREQUISITE
Basic understanding of production, intervention operations, and reservoir engineering.

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### Introduction to Well Completions

**Foundation – 5 Days**

The course introduces basic concepts of Completion Engineering. It familiarizes the attendants with conventional completions and equipment. Intelligent completions (ICV and ICD) are also explained. At the end of the course, attendants will understand the criteria for completion selection, the functions of typical completion equipment and accessories.

#### COURSE CONTENT
- Introduction to the Course.
- Initial quiz.
- Revision of Reservoir concepts.
- Characterization of reservoir fluids.
- Well Completion methods.
- Flow in porous media.
- Well deliverability (exercises).
- Completion effects.
- Flow in pipes.
- Choke performance.
- System analysis.
- Wellheads.
- Casing suspension.
- Tubing selection.
- Tubing design.
**COURSE OFFERINGS**

**IMMERSIVE LEARNING PROGRAMS**

**COMPETENCY MANAGEMENT**

- Tubing connections.
- Upper completion accessories.
- Safety valves.
- Packers.
- Artificial Lift.
- Multilaterals.
- Sand Control.
- Fracturing.
- Intelligent completions.
- Use of slickline equipment during well completion.
- Perforations.
- Visit to Schlumberger base for visualization of completion equipment.
- Final quiz.

### Introduction to Cased-Hole Evaluations

**Foundation – 5 Days**

This is a detailed course on Cased Hole Evaluations specially formatted for well intervention supervisors; there is a practical approach. However, the same course can be delivered to engineers with a more academic approach. The first part of the course will focus on reviewing reservoir properties, well integrity - as related to well corrosion and perforations. A short presentation on tool conveyance and well completions will also be included. The main body of the course will concentrate on production logging and reservoir monitoring.

**COURSE CONTENT**

- Tool conveyance and depth control
- Well completions
- Reservoir Engineering
- Reservoir drive mechanism, skin effects, and inflow and outflow performance
- Reservoir fluids
- Nodal Analysis
- Well Integrity: Casing and Tubing Corrosion
- Corrosion Mechanisms
- Corrosion Monitoring: Multi-finger, ultrasonic, electromagnetic, electrical
- Interactive Corrosion Multi-media presentation
- Perforations
- Perforation types,
- Perforation conveyance: casing guns, through tubing, tubing conveyed perforations.
- Productivity Index- Perforation Efficiency
- Perforation Safety
- Production Logging
- Flow Regimes
- Basic Production Logging Tools: Temperature, Flow Spinner, Gradiomanometer, hold-up meter, densitometer, Quartz Pressure Gauges
- Additional New Sensors: Gas Holdup Optical Sensor Tool (GHOST), Electric Sensor (water holdup Logging- FloView), Cross-sectional Coverage of the production string (FloScan Imager).

### Introduction to Flow Assurance

**Foundation – 5 Days**

This course introduces attendees to the main types and causes of flow impediments along with the methods and technologies commonly applied for their prevention, control, and remediation. The course will increase your understanding of the main problems associated with flow assurance, including asphaltenes, paraffins, emulsion, scales, sand, slugging, corrosion, and hydrates. Learn which technologies and techniques to use for specific problem environments and the advantages and disadvantages of each. Attendees will identify the types and causes of flow impediment and the methods or technologies that should be applied for the prevention, control, and remediation of these flow impediments.

**COURSE CONTENT**

- Flow assurance principles and fundamentals
- Inorganic scale: Deposition principles, prediction, modeling, management program design, and scale prevention
- Hydrates: Deposition principle, impact, hydrate detection, control, and remediation
- Interpretation Parameters and Tool Calibrations
- Spinner calibrations, spinner reversal
- Turbulent and laminar flow
- Friction and viscosity effects
- Fluid holdups
- Slippage velocities for oil / gas / water
- Production Evaluation
- Flow Regimes
- Single-Double and three phase production evaluation
- Production Logging in Horizontal Wells
- Leak Detection
- Applications of various techniques to detect flow behind casing and inside casing
- Noise logging
- Geothermal temperature profiles and temperature data base
- Data Base applications and type-curves
- Water Flow Log
- Reservoir Monitoring
- Nuclear physics applications for behind-casing saturation monitoring
- Pulse Neutron Logging: Traditional techniques of computing Sw where the formation water salinity is reasonably high.
- Carbon Oxygen logging: Applications in fresh water environments
- Cased-Hole Formation Resistivity (CHFR): Measurements of formation resistivity behind the casing.
- Cased-Hole Dynamics Tester (CHDT): Testing and sampling fluids behind the casing.
- Basic Well Testing
- Basics of Well Testing

**AUDIENCE**

Specially designed for well intervention supervisors, the course can be delivered, without changing any subject but only the approach to engineers.

**PREREQUISITE**

A technical degree (secondary school) is required but preferentially an university degree on engineering or science is more adequate.

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**Software** • Technical courses that use software • Includes practical sessions • Field trips • Uses simulation

[177]
• Paraffins (wax): Deposition principle, properties, factors affecting deposition, operational problems, control, and remediation
• Asphaltenes: Deposition mechanism, modeling, effect of variables, operational problems, prevention, and remediation
• Emulsions: Crude oil natural surfactants, characteristics, and treatments
• Corrosion: Factors influencing oilfield corrosion and their control

**AUDIENCE**
Engineers responsible for assessing, diagnosing, or troubleshooting flow assurance problems in an operational or design capacity.

**PREREQUISITE**
General knowledge of production systems and surface operations.

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### Basic Production Logging

**Foundation – 5 Days**

Production logging tools have specific uses as well as limitations. Attendees will learn the various applications for these tools, the interpretation assumptions that are integral to their designs, and how log quality is affected by the acquisition process. Hands-on demonstrations teach the fundamentals of production log interpretation, and an in-class workshop focuses on the interpretation of single- and two-phase flow. Discussion includes use of these logs for measurement of three-phase flow.

**COURSE CONTENT**

- Inflow and outflow performance and productivity index for oil wells and gas wells
- Tool conveyance using tractors and coiled tubing
- Depth control in cased wells using gamma ray and casing collar locator data
- Completions for vertical, deviated, horizontal, and multilateral wells
- Pressure-control system for rigless operation
- Reservoir fluids properties, including gas/oil ratio, bubblepoint pressure, three-phase diagrams
- Reservoir drive mechanisms and associated production problems
- Justification of production log acquisition
- Standard production logging tools
- Techniques for measuring oil, water, and gas rates
- Interpretation of logs for single-, two-, and three-phase production

**AUDIENCE**
Geoscientists or engineers responsible for interpreting production logs.

**PREREQUISITE**
Engineering or geosciences degree recommended as this course deals with the production logging physics.

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### Introduction to Production Engineering

**Awareness – 5 Days**

This course focuses on the basics on production engineering that attendees need to improve their asset team interactions. The attendees will learn about the role of production engineering in building capacity and maximizing production performance using tools including well testing, nodal analysis, and artificial lift. This engineering overview covers the equipment and techniques that production engineers employ both downhole and on the surface.

**COURSE CONTENT**

- Overview of production engineering
- Reservoir fundamentals and nodal analysis

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### OFM Reservoir Optimization

**Advanced – 5 Days**

In this 5-day hands-on workshop, participants will apply engineering principles in a real-world scenario. The reservoir will be developed through multiple phases, including initial primary production, development through workover candidate and infill drilling, final primary production, and secondary recovery through waterflooding.

Participants will make reservoir engineering decisions involving field development. Then they will work over existing wells and drill new wells to improve field recovery with a limited budget to perform economic evaluations and prioritize future work programs. The goal of the workshop is to apply engineering processes and systems in a real-world environment. The result will be enhanced reservoir performance.

**COURSE CONTENT**

- Initial primary recovery I
  - Reservoir familiarization
  - Reservoir evaluation
  - Calculating volumetric OOIP
- Initial primary recovery II
  - Production phase familiarization
  - Workover candidate recognition
  - Evaluating reservoir performance
  - Advanced decline curve analysis
- Initial field development
  - Well volumetric drainage radius
  - Horizontal well analysis
  - Workover follow-up
- Mature primary recovery and initial secondary recovery
  - Additional workover candidate recognition
  - Waterflooding pilot analysis
  - Secondary recovery feasibility
- Mature secondary recovery
  - Waterflood evaluation
  - Surveillance

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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
- Techniques for water injection performance

**AUDIENCE**
Petroleum, reservoir, and production enhancement engineers, geologists, operations and business development managers, and anyone interested in analyzing oil and gas performance data

**PREREQUISITE**
OFM fundamentals course or at least 6 months of application usage with OFM 2012, as well as basic knowledge of oil and gas production, Microsoft Excel spreadsheets, and basic algebra.

**OLGA Advanced Flow Assurance**
**Advanced – 3 Days**

This course mixes lectures and hands-on exercises to help the attendees understand the software background and widen the scope of applications of transient multiphase simulations for flow assurance. The exercises are conducted within the frame of the OLGA simulator GUI. All major features of the GUI are covered, including model building, case runs, parametric studies, and postprocessing. PVTsim analysis is used to generate hydrate curves and wax tables.

**COURSE CONTENT**
- Fluids and compositional tracking with OLGA simulator GUI and PVTsim analysis
- Pipeline profile modeling
- Liquid surges and controller basics
- General guide to separator modeling and sizing
- Hydrates and MEG tracking
- Slug mitigation by control
- Gas lifting
- Well-flowline-riser shut-in and cool-down with hydrate inhibition
- Wax deposition, pigging, and dead-oil circulation
- Overpressure protection
- Water hammer

**AUDIENCE**
Experienced OLGA simulator users who are interested in learning about advanced applications of the OLGA simulator to flow assurance and modeling of more complex systems within the software.

**PREREQUISITE**
OLGA Flow Assurance course and preferably previous project experience with OLGA software.

**OFM Waterflood Monitoring and Surveillance**
**Advanced – 1 Days**

In this 1-day course, the OFM Streamline module will be used to automatically or graphically define waterflood patterns with production and reservoir data. By combining this information with pressure data and PVT algorithms, reservoir volumes and voidage can be determined. Attendees will also gain experience in setting up patterns and performing analyses on a waterflood project.

**COURSE CONTENT**
- Configuring static and dynamic patterns
- Using pressure and PVT data
- Loading reservoir property data
- Reviewing the performance of the waterflood as a whole
- Analyzing the waterflood by pattern
- Calculating voidage replacement ratios and comparing by pattern
- Creating grid maps by well and pattern
- Creating waterflood control diagnostic and Hall plots
- Using the OFM Sweep module to estimate pattern configurations and pattern outlines

**AUDIENCE**
Anyone with a need for to experience in setting up patterns and performing analyses on a waterflood project in OFM* well and reservoir analysis software

**PREREQUISITE**
OFM software proficiency or OFM Fundamentals course

**OLGA Fluid Handling**
**Advanced – 1 Days**

In this 1-day course combines lectures and hands-on examples to better understand the various options that are available in OLGA to simulate the fluid phase behavior and physical property predictions. The workshop shows how to use the various options, and, more importantly, when to use them and when not to use them.

**COURSE CONTENT**
- Use of PVT tables, including generation of tables using Multiflash
- Discussion of Compositional Tracking and example on its use
- Several examples showing problems where Compositional Tracking is essential to properly model the system
- Discussion of Black Oil Modeling and an example on its use
- Discussion of the uses and limitations of Black Oil Modeling
- Discussion of the Single Component Model
- Several exercises using the Single Component Model
- Discussion of the uses and limitations of the Single Component Model
- Discussion of Inhibitor Tracking in OLGA
- Discussion of the Complex Fluids module in OLGA and an exercise showing its use
- Use of the Fluid Definition Tool for drilling fluids
- Miscellaneous fluids topics in OLGA

**AUDIENCE**
Experienced OLGA users who are interested in learning more about the use of the various fluids handling models in OLGA.

**PREREQUISITE**
Ofm software proficiency or OFM Fundamentals course

**OFM Intermediate Using Oil and Waterflood Examples**
**Skill – 3 Days**

This course extends the materials covered in the OFM software fundamentals course and introduces two key areas of functionality: forecasting and mapping. The course introduces the attendees to a wide variety of map-based visualizations—bubble, grid, contour, scatter, and surface maps. In forecasting the OFM software offers a highly interactive module for the user to history match and subsequently forecast production. The widely used Arps technique is covered, and attendees create forecasts using a variety of assumptions. In addition to single-phase (oil, gas) forecasts, the course covers ratio forecasts. Additional techniques such as calculated forecasts, together with how to generate effective use of the results are explained. Although plots and reports are valid utilities for monitoring and surveillance, presenting data and calculation results in the form of a map is
infinitely more effective. Vast amounts of information can be absorbed very quickly. Waterflooding is a universally popular method of secondary recovery. For waterflood operations, all calculations need to be made on a reservoir volume basis. This course introduces PVT as a way of achieving this goal. Pattern creation and management techniques are now possible. A range of diagnostic techniques is introduced as a means of illustrating the underlying capabilities of the application.

**COURSE CONTENT**
- Introducing PVT by various methods
- Creating waterflood patterns
- Configuring OFM software for pattern-based calculations
- Pattern diagnostics
- Mapper applications
- Bubble, grid, and contour map
- Scatter and map XY plots
- Forecasting and forecast scenarios
- History-match techniques
- Ratio and calculated forecasts and reports

**AUDIENCE**
Development geoscientists, development reservoir engineers, and production engineers.

**PREREQUISITE**
OFM software knowledge or the OFM Fundamentals course.

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**OLGA Well Dynamics**

**Skill – 5 Days**

This 5-day course is intended to train the attendees who work with production and well performance to use the OLGA software to simulate the flow transients in the wells and production systems. This course is very suitable for engineers who would like to simulate the offshore well operation scenarios. The course has a good balance in content between the well flow dynamics and the hands-on OLGA simulator skill learning. This course also helps the OLGA simulator beginners to quickly grasp the "dynamic" concept, gain basic skills to use OLGA simulator software independently, and lay a solid foundation for building up advanced modeling capabilities.

**COURSE CONTENT**
- OLGA simulator well modeling capability
- OLGA simulator well modeling capability
- The OLGA simulator model and its execution
- Numerical solution scheme and sectioning principles
- PVT aspects in OLGA simulation and PVTsim OLGA interface
- Well model building in the OLGA simulator
- Artificial lift modeling with the OLGA simulator
- Mud and well engineering fluid modeling and applications
- Steady-state simulation and parametric study
- Shut-in and start-up
- Simple gas-lift modeling
- Electric submersible pump modeling
- Wellbore cleanup
- Blowout and well kill (optional)

**AUDIENCE**
Anyone involved in evaluating artificial lift options, optimize gas lift allocation, and perform ESP design using PIPESIM simulator software.

**PREREQUISITE**
PIPESIM Fundamentals course or a working knowledge of PIPESIM simulator software.

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**VISIT NExTTRAINING.COM/CLASSES FOR THE LATEST CALENDAR OR TO REGISTER FOR A COURSE**
Engineers who need to install, deploy and configure Avocet and it’s extensions

**PREREQUISITE**

Prior knowledge of Avocet would be useful, but is not required.

### Petrel Production Data Interpretation and Forecasting

**Skill – 3 Days**

This course is based on Petrel 2014.3, it provides a comprehensive overview of Petrel as a tool for production interpretation and forecasting. It encompasses workflow ranging from production diagnostics using specialized plots to Rate Transient Analysis (RTA) and production forecasting with analytical simulation. The RTA methods in Petrel places emphasis on fracture characterization. The workflow includes quick parameter estimation using "line-fits" as well as more advanced non-linear regression.

**COURSE CONTENT**

- Production forecasting with analytical simulation
- Rate Transient Analysis - RTA
- Production diagnostics with pressure transient plot and rate transient plot
- Field case studies and exercise

**AUDIENCE**

Reservoir engineer, production engineer, completions engineer and stimulation engineer with interested in learning well performance analysis and production optimization using Petrel.

**PREREQUISITE**

Petrel fundamentals course or similar Petrel experience, Basic knowledge in Microsoft Windows and practical computing skills, Basic knowledge in reservoir and production engineering fundamentals.

### Integrated Asset Modeler Fundamentals

**Skill – 5 Days**

This course demonstrates the primary functionalities of IAM for integrated asset modeling studies. It covers coupling model procedures for reservoir to network, network to surface and reservoir, network to economic model including the composition management between models. The course covers a brief introduction to IAM utilities like variable sensitivity, and optimizer.

**COURSE CONTENT**

- Couple reservoirs to networks
- Run time-based simulations
- Connect models
- Add a Microsoft Excel model to a flow diagram
- Transfer compositions
- Learn key reservoir network coupling fundamentals
- Create Asset Management Strategies
- Perform Optimization studies
- Evaluate economics with Merak Peep models

**AUDIENCE**

Anyone who wants to integrate reservoir with surface models using Integrated Asset Modeler technology.

**PREREQUISITE**

Anyone currently working in a production, reservoir, or process engineering position or in an asset business development environment with knowledge of either ECLIPSE, PIPESIM, or HYSYS software.

### OFM Intermediate Using Oil and Waterflood Examples

**Skill – 3 Days**

This course extends the materials covered in the OFM software fundamentals course and introduces two key areas of functionality: forecasting and mapping. The course introduces the attendees to a wide variety of map-based visualizations—bubble, grid, contour, scatter, and surface maps. In forecasting the OFM software offers a highly interactive module for the user to history match and subsequently forecast production. The widely used Arps technique is covered, and attendees create forecasts using a variety of assumptions. In addition to single-phase (oil, gas) forecasts, the course covers ratio forecasts. Additional techniques such as calculated forecasts, together with how to generate effective use of the results are explained. Although plots and reports are valid utilities for monitoring and surveillance, presenting data and calculation results in the form of a map is infinitely more effective. Vast amounts of information can be absorbed very quickly. Waterflooding is a universally popular method of secondary recovery. For waterflooding operations, all calculations need to be made on a reservoir volume basis. This course introduces PVT as a way of achieving this goal. Pattern creation and management techniques are now possible. A range of diagnostic techniques is introduced as a means of illustrating the underlying capabilities of the application.

**COURSE CONTENT**

- Introducing PVT by various methods
- Creating waterflood patterns
- Configuring OFM software for pattern-based calculations
- Pattern diagnostics
- Mapper applications
- Bubble, grid, and contour map
- Scatter and map XY plots
- Forecasting and forecast scenarios
- History-match techniques
- Ratio and calculated forecasts and reports

**AUDIENCE**

Development geoscientists, development reservoir engineers, and production engineers.

**PREREQUISITE**

OFM software knowledge or the OFM Fundamentals course.

### PIPESIM Gas Field Production Operations

**Skill – 2 Days**

This course covers the use of the PIPESIM steady-state multiphase simulator for designing and modeling gas production systems operations. Practical and comprehensive problems will be presented, discussed, and analyzed throughout the course.

**COURSE CONTENT**

- Navigate the PIPESIM simulator user interface
- Troubleshoot and debottleneck network models
- Model gas wells, including various completion models
- Match inflow performance to test data
- Model water separation, injection into a salt water disposal well, and wellhead or manifold production sources
- Construct a compositional fluid model
- Predict gas hydrate formation, erosion, corrosion, and liquid loading in gas wells
- Model centrifugal and reciprocating gas compressors
COURSE OFFERINGS

Avocet Software Development Kit (SDK)

Skill – 5 Days

In this course, you will explore the functionalities of the Avocet Software Development Kit. Also, you will learn how to extend and enhance the capabilities of Avocet using the Avocet Software Development Kit (SDK), such as: adding calculation routines, accessing data and creation of customized user screens for specific workflows.

COURSE CONTENT

- Introduction to Avocet – the user interface, the architecture and the "services" provided by Avocet.
- Understanding the extensibility offered through the platform
- Examining the primary configuration files used by the system
- The anatomy of an extension and layering
- Adding to / customizing the data model
- Navigators
- Creating XML-based screens
- Creating a development project and running a hello world process
- Using avocet’s services programmatically (data access, units, localization, type system)
- Using the item performance cache
- Using the SDK wizards
- Creating coded screens
- Communicating between the client tier and server tier
- Using the configuration files to point to external data sources
- Shared calculations
- A full WPF screen
- Item link chains
- Deploying an extension
- Developer best practices

AUDIENCE

Software developers who require practical training in how to customize Avocet to extend its capabilities

PREREQUISITE

Attendees should have medium to strong C# development experience. Attendees will work in Visual Studio 2013. Prior knowledge of Avocet would be useful, but is not required.

Petrel Well Deliverability

Skill – 1 Day

This course builds on the Petrel platform reservoir engineering course and is an extension of the well modeling environment within the Petrel platform software suite. The course provides support for existing reservoir engineering workflows such as development strategy and field management. Two main production workflows are discussed in the course: performance table collection and nodal analysis simulation. Attendees will learn how to use reservoir simulated variables as input data for creating performance tables and running a nodal analysis case. The integration of production simulated variables to support reservoir engineering workflows will be demonstrated by creating performance (VFP) tables within the Petrel suite and associating the results with the development strategy project. In this way, an integrated reservoir-production engineering cycle is completed without leaving the Petrel platform environment. The attendees will also learn how to use nodal analysis simulation to introduce several inflow performance relationship models for pressure and temperature traverse. When running the nodal analysis case, attendees will learn how to create profile plots, such as liquid holdup, erosional velocity ratio, fluid mean velocity, and so forth.

COURSE CONTENT

- Well deliverability module
- IPR model manager and supported flow correlations.
- Petrel platform well model optimization by creating a single-flow path model
- IPR model manager
- Fluid properties for better understanding of input data
- Hydraulic (VFP) tables
- VFP tables association with a development strategy
- Nodal analysis case and display nodal charts
- Profile spreadsheets and derived logs generated from nodal analysis through Petrel platform software
- Well models importing from PIP

AUDIENCE

Development and exploration geologists, geophysicists, geochemists, petroleum engineers, managers, reservoir engineers, and other technical staff.

PREREQUISITE

Petrel Fundamentals course in addition to Petrel Reservoir Engineering course or equivalent experience.

OFM Application Programming Interface (API)

Creating a Calculated Field

Foundation – 1 Hour

In this webinar, you will learn how to extend the features of OFM by using the Application Programing Interface (API). Through a live demonstration, you learn to create an OFM plug-in for an engineering function that mimics a calculated field in MY OFM workspace without disturbing the data sources or the Shared OFM workspace. OFM API is a gateway to extend OFM capabilities. It is the most efficient way to create OFM plug-ins for new system functions or analysis tools.

COURSE CONTENT

- OFM calculated field
- General description of an OFM plug-in
- Walkthrough of building a calculated field using C#
- Live demo

AUDIENCE

Anyone interested in adding their own knowledge or science to OFM with basic programming skills

PREREQUISITE

Attendees should be familiar and comfortable with Windows environment and some knowledge of C#
OLGA Flow Assurance

**Foundation – 3 Days**

This 3-day course is intended to turn a beginner into an OLGA simulator software user, capable of running realistic flow assurance tasks. A mixture of lectures and hands-on exercises helps attendees understand flow assurance challenges, the fundamentals of multiphase pipeline thermo-hydraulics, and how to apply the OLGA simulator to realistic flow assurance issues. The exercises are conducted using the OLGA simulator graphical user interface (GUI). All major features of the GUI are covered, including model building, case runs, parametric studies, and effective post-processing. Fluid property tables for the OLGA simulator software are generated with the PVTsim third-party compositional PVT analysis and characterization software. Our experienced instructors focus on teaching the attendees how to turn data into an acceptable and effective OLGA simulation.

**COURSE CONTENT**

- Basic multiphase production hydraulics and thermal issues
- Introduction to OLGA simulator topology and basic assumptions
- Introduction to PVTsim analysis
- Flow assurance issues for oil and gas-condensate production
- Terrain slugging mitigation, hydrodynamic slugging, and OLGA simulator slug tracking
- Shut-in, cool-down, start-up and depressurization of a well-flowline-riser configuration
- Building a simulation model with minimum information
- Gas condensate pipeline-modeling: Characteristic steady-state behavior, pigging, turndown, ramp-up, three-phase flow, separator with level control

**AUDIENCE**

Beginner to intermediate OLGA simulator user, prospective OLGA simulator licensee, and the design or operations professional interested in exploring the uses and capabilities of multiphase transient simulations.

**PREREQUISITE**

No previous experience with the OLGA simulator is necessary, but a general knowledge of pipe flow and thermodynamics would be advantageous.

OLGA Flow Assurance

**Foundation – 5 Days**

This 5-day course, you will learn how OLGA dynamic multiphase flow simulator is used to understand and solve typical flow assurance challenges. This interactive software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

**COURSE CONTENT**

- Analyze well performance
- Design of models for pipeline and process facilities
- Perform nodal analysis
- Develop black oil and compositional fluid models
- Select multiphase flow correlations
- Surface network models

**AUDIENCE**

Anyone wanting to learn steady-state, multiphase flow simulation for oil and gas production systems to analyze well performance, model pipelines and facilities, and perform nodal analysis using PIPESIM simulator software.

**PREREQUISITE**

None

Avocet Fundamentals

**Foundation – 2 Days**

In this course, you will discover Avocet 2014.1 as Production Operations Software Platform. We will take you through a pre-prepared configuration of a production operations environment to show the benefits of Avocet in a variety of production scenarios. The idea is to use the Avocet system to boost productivity and efficiency of the production operation process. During the course you will explore Avocet for: Production Network Management, Field Data Capture, Production Allocation, Shortfall Analysis, Field Surveillance, Approval and Reporting.

**COURSE CONTENT**

- Introduction to the Avocet user interface and its main components
- Creation of the subsurface network and wellbore schematic
- Creation of the network surface network and network diagram
- Set-up of operator routes and stops
- Operator data collection via both manual entry automated data loading
- Integration of data from real-time sensors
- Display of production information on a surveillance dashboard
- Production back-allocation processing
- Shortfalls and downtime analysis
- Data approval and reporting

**AUDIENCE**

Anyone interested in gaining a general understanding of Avocet as Production Operations Software Platform.

**PREREQUISITE**

Attendees should be familiar and comfortable with Windows environment and Microsoft Office.

OFM Application Programming Interface (API) Fundamentals

**Foundation – 1 Hour**

In this webinar, you will learn how OFM Application Programming Interface (API) is a gateway to extend OFM capabilities. It is the most efficient way to create OFM plug-ins for new system functions or analysis tools. The session is designed to give practical examples where anyone with basic programming skills can add their own knowledge to an OFM project, increasing their day-to-day efficiency.

**COURSE CONTENT**

- Introduction to OFM Application Interface (API)
- Application of plug-in functions in OFM analysis
- Live demo of three engineering functions as OFM plug-ins: Calculated Field
  - Running maximum
  - Fitting a power trend to data

OLGA Flow Assurance

**Foundation – 5 Days**

This 5 days course, you will learn how OLGA dynamic multiphase flow simulator is used to understand and solve typical flow assurance challenges. This interactive software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

**COURSE CONTENT**

- Basic multiphase production hydraulics and thermal issues
- Introduction to OLGA simulator topology and basic assumptions
- Introduction to PVTsim analysis
- Flow assurance issues for oil and gas-condensate production
- Terrain slugging mitigation, hydrodynamic slugging, and OLGA simulator slug tracking
- Shut-in, cool-down, start-up and depressurization of a well-flowline-riser configuration
- Building a simulation model with minimum information
- Gas condensate pipeline-modeling: Characteristic steady-state behavior, pigging, turndown, ramp-up, three-phase flow, separator with level control

**AUDIENCE**

Beginner to intermediate OLGA simulator user, prospective OLGA simulator licensee, and the design or operations professional interested in exploring the uses and capabilities of multiphase transient simulations.

**PREREQUISITE**

No previous experience with the OLGA simulator is necessary, but a general knowledge of pipe flow and thermodynamics would be advantageous.

**PIPESIM Fundamentals**

**Foundation – 2 Days**

In this course, attendees explore the PIPESIM simulator, which provides steady-state, multiphase flow simulation for oil and gas production systems. Individual PIPESIM modules are used for a wide range of analyses, including well modeling, nodal analysis, field planning, artificial lift optimization, and pipeline and process facilities modeling. A major feature of the PIPESIM simulator is the system integration and openness that allows users to develop a Total Production System Model. The attendees will gain a general understanding of how PIPESIM simulator software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

**COURSE CONTENT**

- Analyze well performance
- Design of models for pipeline and process facilities
- Perform nodal analysis
- Develop black oil and compositional fluid models
- Select multiphase flow correlations
- Surface network models

**AUDIENCE**

Anyone wanting to learn steady-state, multiphase flow simulation for oil and gas production systems to analyze well performance, model pipelines and facilities, and perform nodal analysis using PIPESIM simulator software.

**PREREQUISITE**

None

**Avocet Fundamentals**

**Foundation – 2 Days**

In this course, you will discover Avocet 2014.1 as Production Operations Software Platform. We will take you through a pre-prepared configuration of a production operations environment to show the benefits of Avocet in a variety of production scenarios. The idea is to use the Avocet system to boost productivity and efficiency of the production operation process. During the course you will explore Avocet for: Production Network Management, Field Data Capture, Production Allocation, Shortfall Analysis, Field Surveillance, Approval and Reporting.

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- Set-up of operator routes and stops
- Operator data collection via both manual entry automated data loading
- Integration of data from real-time sensors
- Display of production information on a surveillance dashboard
- Production back-allocation processing
- Shortfalls and downtime analysis
- Data approval and reporting

**AUDIENCE**

Anyone interested in gaining a general understanding of Avocet as Production Operations Software Platform.

**PREREQUISITE**

Attendees should be familiar and comfortable with Windows environment and Microsoft Office.

**OFM Application Programming Interface (API) Fundamentals**

**Foundation – 1 Hour**

In this webinar, you will learn how OFM Application Programming Interface (API) is a gateway to extend OFM capabilities. It is the most efficient way to create OFM plug-ins for new system functions or analysis tools. The session is designed to give practical examples where anyone with basic programming skills can add their own knowledge to an OFM project, increasing their day-to-day efficiency.

**COURSE CONTENT**

- Introduction to OFM Application Interface (API)
- Application of plug-in functions in OFM analysis
- Live demo of three engineering functions as OFM plug-ins: Calculated Field
  - Running maximum
  - Fitting a power trend to data
and practical course includes step-by-step instructions to build and run simple transient simulation models. Key operational procedures are covered, like shutdown, start-up and pigging. Best practices and workflows are also presented for liquid and hydrate management, slugging recognition and mitigation, and fluid handling in OLGA.

The last two days are focused on advanced OLGA workflows to model separators, controllers, and how to model thermal interactions between pipes and surroundings.

**COURSE CONTENT**

- Introduction to multiphase production hydraulics and thermal issues
- Introduction to OLGA GUI
- Fluid handling in OLGA
- Introduction to the Flow Assurance concept
- Simulation of terrain slugging mitigation, hydrodynamic slugging and usage of OLGA Slug tracking
- Construction of a well-pipeline-riser oil system to simulate typical operational scenarios like shut-in, cool down, start-up and depressurization
- Simulation of liquid accumulation and pigging in gas condensate pipeline
- Evaluation of hydrate formation risk and inhibition
- Modeling separators and controllers in OLGA
- Modeling a pipeline using the Pipeline editor
- Introduction to advanced thermal modeling options

**AUDIENCE**

Anyone interested in gaining a general understanding of OLGA dynamic multiphase flow simulation to address flow assurance challenges, or beginner to intermediate OLGA users who want to explore OLGA advanced workflows and tools.

**PREREQUISITE**

None

**PIPESIM Surface Facility**

**Foundation – 2 Days**

This course teaches the usage of the PIPESIM 2015 steady-state multiphase simulator for designing and modeling the operations of surface production systems. Practical and comprehensive problems will be discussed and analyzed throughout the course. Specific topics that will be covered during this course will include multiphase pressure drop concepts, phase behavior and hydrocarbon fluid modeling, gathering network overview and production diagnostics, surface equipment sizing, and handling single component production system.

**COURSE CONTENT**

- PIPESIM Overview
- Simple Pipeline Tutorials
- Network Model Building Using GIS Shape file
- Gathering System Design and Analysis Workflows
- Hydrate Screening and Mitigation Strategies
- Production Optimization Using Compressors
- Pipeline Booster Location and Preliminary Sizing
- Single Component Systems Modeling
- Demo – Integration of Steady State and Transient Multiphase Flow Solutions

**AUDIENCE**

Anyone who needs to learn steady-state, multiphase flow simulation for oil and gas production systems to model pipelines and facilities using PIPESIM software.

**PREREQUISITE**

An interest in using PIPESIM software to analyze the performance pipelines, and facilities.

**OFM Fundamentals Using Canada Data Sources**

**Foundation – 2 Days**

This course is specifically designed for OFM Canadian audience. You are introduced to the primary functionalities of OFM by interacting with an OFM project created using Canada public data sources exported from the IHS database using AccuMap or GeoScout. The exercises are designed for you to apply OFM workflows in production monitoring and surveillance tasks. You will use standard templates and calculated variables that are used by most of the Oil & Gas companies in Canada. This course strives to immediately apply OFM concepts learned in the classroom into daily work activities.

**COURSE CONTENT**

- Navigate an OFM project
- Create a new OFM project using Canada public data exported from AccuMap or GeoScout
- Customize OFM workspace
- Explore OFM project database structure
- Add new data tables and calculated variables
- Discover OFM filter techniques to select data
- Create plots and graphs to display data
- Introduce data normalization OFM feature
- Create and customize reports
- Apply OFM decline curve analysis module to assess well reserves
- Explore mapping techniques in OFM including Bubble Maps, Grid Maps and Scatter Plots

**AUDIENCE**

Anyone interested in gaining a general understanding of OFM

**PREREQUISITE**

Attendees should be familiar and comfortable with Windows environment and Microsoft Office. Knowledge of oil and gas production operation is useful but not required.

**OFM Administration**

**Foundation – 3 Days**

This course will take the attendees through a series of hands-on exercises spanning project creation, project configuration, and workspace customization. This course is designed for technical support personnel rather than end users, and is therefore focused on the OFM software underlying structure rather than its analytical functionalities.

The OFM software provides a cost-effective and integrated environment in which to accomplish complex workflows, in addition to forecasting analysis and visualization of reservoir and production data. OFM software enables early detection of production problems and their possible causes, allowing engineers to manage a larger number of wells in less time and unlocking the asset to produce at full potential.

**COURSE CONTENT**

- Project creation
- Project filters
- Project configuration: OFM workspace customization
- Base map customization

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Shared workspaces
• OFM tools and settings
• GIS maps

AUDIENCE
Anyone who needs to configure or support OFM software for end users.

PREREQUISITE
None

OFM Fundamentals Using Gas Operations Examples

Foundation – 2 Days

This course introduces attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared gas well operations project. The flow of the course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks using the OFM software suite. The course covers each of the required tasks. In accomplishing the tasks, the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters. The course also covers graphical display features, ranging from tabular plots through line graphs to GIS map-based representations.

COURSE CONTENT
• Brief walkthrough of a fully functioning project to provide quick set of reference points
• Review project data and check for missing values
• Use filters to screen out unwanted entities for analysis
• Group project data at multiple levels
• Create calculated fields and calculated variables
• Create single- and multiple-well plots
• Create and format well and field summary reports
• Export reports and table data to other applications

AUDIENCE
Anyone responsible for setting up and maintaining a project using OFM software.

PREREQUISITE
None

OFM Fundamentals Using Oil and Waterflood Production Examples

Foundation – 2 Days

This course introduces the attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared oil and waterflood production project. The course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in the OFM software suite. The course covers each of the required tasks. In accomplishing the tasks, the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters. The course also covers graphical display features ranging from tabular plots through line graphs to GIS map-based representations.

COURSE CONTENT
• A brief walkthrough of a fully functioning project
• Review project data and check for missing values

• Use filters to screen out unwanted entities for analysis
• Group project data at multiple levels
• Create calculated fields and calculated variables
• Create single- and multiple-well plots
• Create and format well and field summary reports
• Export reports and table data to other applications

AUDIENCE
Anyone responsible for setting up and maintaining a project using OFM software.

PREREQUISITE
None

Integrated Production Optimization (virtual course)

Foundation – 3 Days

This course provides Production Optimization from Reservoir to Surface Facilities. It is delivered in 3 virtual sessions of 4 hours each. The first session is a revision of fundamental concepts of Reservoir Enhancement (EOR and Water Flooding); the second session is a discussion of Production Optimization Techniques at wellbore (sandface completions and hydraulic fracturing); and the third session covers the integration of subsurface with surface production facilities (identification of restrictions, modeling and trends in the industry for smart wells and fields).

COURSE CONTENT
• Introduction to the course
• Reservoir Enhancement (EOR, Water Flooding)
• Primary and secondary recovery mechanisms
• Standard definitions, types, and methods of calculation of reserves
• Life under primary recovery phase: Recovery targets and ways to improve
• Secondary recovery phases: Immiscible gas injection and water flooding
• Enhanced Oil Recovery – EOR
• Definition and classification of enhanced oil recovery (EOR) methods
• Improved and Enhanced Oil Recovery (IOR & EOR) definitions.
• Limitations of different EOR methods and their environmental impacts?
• Water Flooding
• Water flooding aspects: screening, flood pattern, displacement theory, limitations
• Application of fractional flow theory for oil recovery
• Calculation example about water flood
• Required surface facilities and water flood plant
• Problems and limitations of water flooding
• Production Optimisation technologies at wellbore (sand face completions
• Hydraulic fracturing and sand exclusion)
• Introduction to Production Optimization at Wellbore?
• Formation Damage and Productivity (45 min)
• Formation Damage Mechanisms
• Pseudo-Damage
• Skin, Influence of Skin in Productivity
• Sandface Completions
• Open Hole Completions
Cased Hole Completions and Perforations
- Sand Exclusion Methods
- Gravel Pack, Natural Sand Pack
- Applications and Limitations
- Hydraulic Fracturing
- Purpose of Hydraulic Fracturing
- Hydraulic Fracturing Models
- Step-Rate Test and Minifrac o FracPack
- Fracturing Fluids and Proppants
- Production Prediction
- Subsurface Surface Production optimization
- Revision of Integrated Production System
- Subsurface Surface Production Management
- Identification of restrictions and correctives actions
- Performance Management
- Integrated subsurface surface automation concept
- Integrated Application System and Production System Modeling
- Production system modeling
- Examples using PIPESIM
- Technological Trends and Integrated Information Systems
- Oil and gas production applications o Smart wells and fields

**AUDIENCE**
Drilling, Production, Completion, Reservoir Engineers, Petrophysicists and other personnel in need of a global vision of production impeachments and mitigation and production optimization.

**PREREQUISITE**
BSc in an Engineering or Science and minimum 3 years exposure to Surface or Subsurface well activities.
Surface Facilities Design and Engineering

NEET’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked with a field trips icon, technical courses that use software have been marked with a software icon, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with a practical sessions icon. There are some courses that use simulators and are highlighted with a simulators icon.

<table>
<thead>
<tr>
<th>DOMAIN</th>
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<th>VIRTUAL CLASSROOM</th>
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<tbody>
<tr>
<td>Maintenance and Reliability</td>
<td>Surface Facilities Engineer</td>
<td>COMPETENCY LEVEL</td>
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<tr>
<td></td>
<td>Assuring Flow from Pore to Process</td>
<td>ADVANCED</td>
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<tr>
<td>Plant Turnaround Management (Programmed Plant Shutdown)</td>
<td>The Pipeline Transportation of Produced Hydrocarbons</td>
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<tr>
<td>Condition-Based Maintenance For Static and Rotating Equipments</td>
<td>Multiphase Pumping</td>
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<tr>
<td>Maintenance Management and Control Indicators</td>
<td>Subsea Production Systems (SPS) and Technologies</td>
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<td>Subsurface Surface Production Optimization</td>
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<td>HAZOP</td>
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<td>Practical Flow Assurance Using Transient OLGA Simulation</td>
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<td>HAZOP/HAZID and SIL</td>
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<td>Failure Mode Effect Analysis (FMEA) Applied to Production Operations</td>
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<td>Automation, Instrumentation, Measurements, and Process Control</td>
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<td>Maintenance Cost Control</td>
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<td>Reliability Methodologies Applied to Maintenance</td>
<td>Gas Conditioning and Handling</td>
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<td>Risk and Reliability Engineering</td>
<td>Utilities: Design and Operations</td>
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<td>Maintenance Integrated Planning</td>
<td>Instrumentation and Control Basics</td>
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<td>Maintenance and Reliability</td>
<td>Introduction to HYSYS in Oil and Gas Processing</td>
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<td>Gas Processing and Conditioning</td>
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<td>Crude Oil and Water Treatment</td>
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<td>Introduction to Flow Assurance</td>
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<td>Gathering System and Network</td>
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<td>Surface Facility Production Operations</td>
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Gas and oil pipeline operations

Introduction to HAZOP and Process Hazard Analysis (PHA)

Piping and Pipeline Design, Maintenance, and Operation

| Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation | NEET | 187 |
Surface Facilities Design and Engineering

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections; please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked 📤 while technical courses that use software have been marked 🛠️, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 🟢. There are some courses that use simulators and are highlighted with 🚀.

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<td>OLGA</td>
<td>PIPESIM</td>
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<tr>
<td>Avocet Administration</td>
<td>OLGA Advanced Flow Assurance</td>
<td>OLGA Fluid Handling</td>
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<td>Avocet Software Development Kit (SDK)</td>
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<td>Avocet Fundamentals</td>
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<tr>
<td>Avocet Fundamentals</td>
<td>OLGA Flow Assurance (3 days)</td>
<td>PIPESIM Surface Facility</td>
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### Surface Facilities Design and Engineering

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<td><strong>FOUNDATION</strong></td>
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<td>Production Chemistry (virtual course)</td>
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Assuring Flow from Pore to Process

Advanced – 3 Days

From this course on flow assurance, attendees gain an advanced understanding of fluid flow through a series of interconnected systems from the reservoir to surface facilities, and the prevention and mitigation of common flow impediments. The attendees will learn best practices from worldwide field examples, as well as how to design fit-for-purpose flow assurance solutions.

COURSE CONTENT

• Definition and identification methodologies of key flow impediments
• Fluid samples
• Current measurement methodologies
• Potential production impediments
• Fluid flow and heat transfer concepts
• Value integrated program
• Case studies

AUDIENCE

Engineers and technical staff responsible for well surveillance, production optimization, or completion design.

PREREQUISITE

Working knowledge of well production behaviors, basic reservoir engineering principles, and surface facilities; exposure to well completion design, nodal analysis, and stimulation processes.

The Pipeline Transportation of Produced Hydrocarbons

Skill – 5 Days

This intermediate level course concerns the pipeline transportation of hydrocarbons and is intended to provide knowledge to the participants on a number of topics that concern flow assurance and cost reduction. The course provides a high level overview of many interrelated topics at a practical level. These include

COURSE CONTENT

• Fundamentals
• Oil Field Processes and Requirements
• Temperature and Pressure Effects on Oil Viscosities
• Software demonstration
• Fluid Mechanical Considerations
• Fluid Mechanical Methods for Predicting Pressure Losses and Energy Requirements (pseudo single phase flow in pipelines)
• Isothermal Flow in Pipelines
• Chemical and Thermal Considerations
• Properties of Compressible gases
• Diluents and Diluted Crude Oils
• Transportation Using Heat
• Scaling
• Multiphase Systems
• Surfactant Based Systems
• Sand in Oil
• Multiphase Flow (Part I)
• Multiphase Systems and Client Problems
• Multiphase Flow (Part II)
• Client Problem Session
• Course Review

AUDIENCE

Surface facilities production engineer, surface facilities design engineer, Operation engineer

PREREQUISITE

Basic knowledge of production surface facilities

Plant Turnaround Management (Programmed Plant Shutdown)

Skill – 5 Days

Course material is designed to give attendees the tools and knowledge required to optimize programmed plant shutdowns or turnarounds. The attendees will learn to apply principles and methods based on effective, efficient, and safe shutdown of actual plants. Instruction focuses on planning, programming, maintenance activities, and controls to obtain the lowest cost while meeting or exceeding quality and safety standards.

COURSE CONTENT

• Programmed plant shutdown management (maintenance turnaround management)
• Types of plant shutdowns
• Top-down review of the macrofunctions in plant shutdown planning
• Barriers to and key factors for the success of a plant shutdown
• Methods to manage a programmed plant shutdown
• First stage: Integrated strategy (actual cases)
• Second stage: Development of scope of work (actual cases)
• Third stage: Execution of plant shutdown (actual cases)
• Fourth stage: Plant shutdown closeout (actual cases)

AUDIENCE

Engineers, planners, supervisors, and managers responsible for plant turnaround planning or implementation who need a systematic methodology for plant turnaround management.

PREREQUISITE

Strong knowledge of maintenance and reliability engineering.

Condition-Based Maintenance for Static and Rotating Equipments

Skill – 5 Days

The course provides attendees with a methodology to establish, revise, and optimize the systems controlling static and rotating equipment using condition-based maintenance (predictive maintenance), algorithms, and processes. Course emphasis is on the use of proactive monitoring combined with technical and financial constraints to ensure the operational reliability required by the production system. Through exercises derived from real-world projects, attendees will practice these techniques.

COURSE CONTENT

• Maintenance practices, paradigms, value chain, and expenses
• Benefits of condition-based maintenance
• Handling information to modify maintenance plan and improve decisions
• Techniques for condition-monitoring maintenance in rotation equipment
• Monitoring techniques
• Dynamic monitoring on rotating equipment
• Integrating inspection techniques
• Condition monitoring in static equipment
• Cost-risk-benefit procedure for condition-based maintenance plan
• Economic justification of condition-based maintenance plan

**AUDIENCE**
Maintenance and reliability engineers, and surface production engineers responsible for maintaining rotating or static equipment.

**PREREQUISITE**
Basic knowledge of maintenance and reliability engineering.

### Multiphase Pumping

**Skill – 5 Days**

This 5-day course reviews the basic concepts of flow in pipes and its interaction with multiphase pumps. Also, the operating principles of different multiphase pumps and state-of-the-art technology are described. Finally, the criteria for selection and design of a multiphase pumping system will be discussed.

**COURSE CONTENT**

- Fundamentals of single-phase pumps
- Centrifugal pumps
- Positive displacements pumps
- Pump system design
- Fundamentals of multiphase flow
- Introduction to two-phase flow modeling
- Introduction to multiphase networks
- Introduction to multiphase pumps
- Utilization of multiphase pumps
- Multiphase pumps: thermodynamic considerations
- Multiphase pumps: design and selection
- Multiphase pumps: performance analysis
- Mechanical sealing technology
- Subsea applications
- Selected cases presented by Boreman pump

**AUDIENCE**
Production engineers, technologists, and people involved in production optimization who want to gain more knowledge about multiphase pumping and pipe flow characterization

**PREREQUISITE**
None

### Subsea Production Systems (SPS) and Subsea Technologies

**Skill – 5 Days**

An introduction to subsea production system facilities, this course takes the attendee from conceptual design to operation. The attendees will learn about the latest facility designs and implementations, their advantages and disadvantages, and the rapidly changing trends of future technologies.

**COURSE CONTENT**

- SPS concepts, definitions, and commonly used architectures
- General design requirements and drivers
- SPS equipment, selection, and operation
- Flow lines
- Flow assurance
- Maintenance and repair
- Subsea well intervention
- Digital oil field
- Production monitoring, control, and optimization technology
- Data acquisition and data management
- Discussion of integrated systems and examples

**AUDIENCE**
Engineers involved with subsea facilities design or operations who want to learn about evolving subsea facility technologies.

**PREREQUISITE**
General knowledge of oil and gas production systems and offshore production systems.

### Subsurface-Surface Production Optimization

**Skill – 5 Days**

From this overview of the production system from reservoir to separator, attendees learn to identify, select, and apply maintenance indicator, or KPIs, which ensure effective maintenance management, maximize equipment performance, and clearly communicate the current status to all decision makers. Attendees will learn to understand the common indicators, what they can tell the user, and the value they bring. Discussion includes the importance of composite KPIs and how to select the right mix of indicators.

**COURSE CONTENT**

- Maintenance: Definition, evolution, and classification of standardized indicators (types and application)
- Data selection and analysis for KPIs
- Efficiency indicators: Mean time between failure, mean time to repair, availability, and reliability
- Performance indicators: Absenteeism, overtime, contracted manpower, training, and training plan
- Costs and safety indicators
- Economic indicators: NPV and return on investment (ROI)
- Maintenance indicators: How to make it run
- Analysis of actual cases
- Deviation analysis

**AUDIENCE**
Engineers, managers, or planners responsible for maintenance or production processes.

**PREREQUISITE**
Knowledge of maintenance and reliability engineering.
learn to optimize the process using an integrated approach, including nodal analysis and identification of major pressure losses. In hands-on in-class exercises, the attendees will use specialized software to identify constraints and propose recommendations for production optimization.

**COURSE CONTENT**

- Production system overview from reservoir to surface: Production system and process, well completions, lift methods, gathering systems, and separation systems
- Nodal analysis: Main pressure-drop components, inflow performance relationship, completion, tubing system graph, and gas well production behavior
- Subsurface-surface production operation: Integrated vision, procedures, best practices, identification of restrictions and corrective actions, production optimization using automation technology, and performance management
- Integrated production systems: Software and tools for performance modeling, technology trends, and integrated information management for control, monitoring, and automation

**AUDIENCE**

Engineers responsible for production optimization and tasked with evaluating a subsurface network and surface system as one integrated system.

**PREREQUISITE**

Knowledge of the production system from subsurface to surface.

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**HAZOP**

**Skill – 3 Days**

This course provides the participants significant aspects and considerations to conduct an efficient HAZOP. At the completion of the course participants will have a good understanding of the HAZOP risk assessment technique and will be able to apply it.

**COURSE CONTENT**

- What is A HAZOP?
- The need for HAZOP
- Scope
- Limitations
- Information required
- HAZOP Method Breaking a process down into defined sections
- HAZOP study Assumptions
- HAZOP Review Applications
- Ideal HAZOP Review Reference Data
- HAZOP Method Credible Scenarios or Causes
- Non-Credible Scenarios or Causes
- HAZOP Technical Suggestions
- HAZOP Review Suggestions
- HAZOP Recommendations and reporting
- Risk Assessment measurement
- HAZOP study cases

**AUDIENCE**

Engineers and chemists in the upstream and downstream segments of the petroleum industry; department, asset, and technology managers.

**PREREQUISITE**

None

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**Practical Flow Assurance Using Transient OLGA Simulation**

**Skill – 5 Days**

This course covers key impediments to flow, including slugging and precipitation of organic and inorganic solids, with examples from various challenging environments. Technologies for capturing fluid samples and characterizing their PVT properties will be reviewed. Participants will be introduced to a leading fluid-modeling software. The course will demonstrate building a simulation model with minimum information.

**COURSE CONTENT**

- Introduction and PVT characterization
- Definition of key flow impediments
- Technologies for capturing fluid samples
- Laboratory solids characterization
- Asphaltenes, paraffin waxes, hydrates, and inorganic scales
- Integration concepts and field example of management approaches
- Fluid flow and heat transfer concepts
- Multiphase flow modeling
- OLGA topology and basic assumptions
- Leading fluid modeling software
- Transient simulation and field examples
- Building a simulation model with minimum information
- Gas condensate pipeline modeling

**AUDIENCE**

Engineers and chemists in the upstream and downstream segments of the petroleum industry; department, asset, and technology managers

**PREREQUISITE**

None

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**Oilfield Corrosion Management**

**Skill – 5 Days**

In this course, attendees receive an introduction to the mechanisms and causes of corrosion in oil and gas production systems and the appropriate methods for monitoring and control. The attendees will learn to identify the corrosion mechanism and estimate and predict the corrosion rates in addition to understanding how to select materials based on the corrosion environment, evaluate and select corrosion inhibitors, and elaborate on a corrosion management plan for pipelines.

**COURSE CONTENT**

- Impact of corrosion in production systems
- Corrosion principles and classification
- CO2 and H2S corrosion
- Corrosion inhibitor mechanisms, guidelines, and selection
- Corrosion prediction: Application to actual cases
- Corrosion monitoring
- Guidelines for material selection
- Pipeline external corrosion: External protection and National Association of Corrosion Engineers recommended practices
- Risk-based inspections
- Actual study cases

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**Surface facilities production operators and technicians, production supervisors, electrical, mechanical and instrumentation and control technicians.**

**PREREQUISITE**

Basic knowledge of the surface facility production system
HAZOP/HAZID and SIL

Skill – 5 Days

This course provides attendees with a working approach to Hazard Operability (HAZOP) practices and procedures. In this course, attendees will learn how to apply the techniques of HAZOP analysis, including the tips, tricks, and secrets analysts use to implement and maintain efficient operation procedures. The course material also covers the tools needed for hazard identification, including root cause identification and the application of redundant system layers for protection, prevention, and mitigation. The attendees will learn how conduct hazard analysis to qualify and quantify risk and the probability of associated failures.

COURSE CONTENT

- HAZOP methods and applications
- Hazard Identification (HAZID) and mitigation strategies
- Hazard analysis and probability determination
- Risk analysis and failure considerations
- Safety integrity level assessment

AUDIENCE

Engineers, safety and environmental personnel, plant operators, area managers, and maintenance personnel.

PREREQUISITE

Basic knowledge of corrosion and production systems.

Multiphase Flow

Skill – 5 Days

In this course, the attendees will learn the theory of multiphase flow and how to calculate the pressure drops in single-phase, dual-phase (gas and liquid), and multiphase flow systems. Attendees will also learn how to conduct flow pattern predictions, evaluate the effects of slugging and transient flow, and gain exposure to fluid flow modeling software.

COURSE CONTENT

- Single-phase fluid
- Pressure drop equations and correlations for single phase flow
- Multiphase flow
- Fluid flow modeling software
- Multiphase flow operational considerations
- Multiphase flow metering

AUDIENCE

Production engineers and facilities engineers.

PREREQUISITE

A basic understanding of surface facilities production systems and fluid hydrodynamics.

Automation, Instrumentation, Measurements, and Process Control

Skill – 5 Days

Attendees will gain theoretical and practical knowledge on how to use automation, instrumentation, control, and metering technologies to increase efficiency and safety of operations and productivity of the production process.

COURSE CONTENT

- Subsurface-surface automation concept
- Automation Pyramid
- Process control: Centralized control, optimization, integration
- Telecommunication
- Value creation quantification
- Inline production optimization
- Automated well tests
- Bottomhole sensors and intelligent wells
- Improvement on Differed production
- Production optimization in line
- Inline optimizers
- Diagnosis and optimization of integrated system
- Technological solutions and automation platforms
- Standards and recommended practices

AUDIENCE

Production engineers, facilities engineers, or operations engineers looking for practical exposure to automation and control concepts and techniques.

PREREQUISITE

Basic knowledge of the production system, process instrumentation, and control metering principles.
Maintenance Cost Control

Foundation – 5 Days

In this course, attendees learn to establish strategic plans for maintenance cost control and create cost classification structures based on their asset or company strategy. The attendees will learn how to identify cost-control weak spots in an asset or operation and generate the information required to support cost-based decisions.

COURSE CONTENT
- Maintenance cost causes
- Maintenance cost classification
- Reliability tools for maintenance cost control
- Maintenance value chain
- Maintenance cost control: Budget and estimations
- Feasibility studies
- Planning tasks and their costs
- Activity-based costs
- Real-world case studies

AUDIENCE
Maintenance personnel responsible for cost-control procedures, monitoring, or decisions.

PREREQUISITE
Basic knowledge of maintenance and reliability engineering.

Vx Multiphase Meter Operations

Foundation – 3 Days

This 3-day course aims at providing sound fundamentals for both operators and data users to be able to operate a Vx meter, understand the process required to properly set it up, and validate and troubleshoot data. After an initial introduction to the fundamental principles of the meter, the course will be mostly applied, based on practical operations on the meter and its associated software as well as hands-on tutorials. This course will give participants a sound understanding of the steps required to operate and set-up a Vx meter, as well as an understanding of measurement sensitivity and the various associated troubleshooting steps to verify data and identify maintenance requirements. In addition to the data acquisition, interpretation, and validation process, this training will also provide an overview of the precautions required when operating the meter to avoid damage to the meter and, importantly, to minimize HSE risks. The course will be held at Schlumberger’s European Learning Center (ELC) training facility in Melun, France.

COURSE CONTENT
- ELC induction and HSE briefing
- Multiphase metering principles and hardware introduction
- Basic components, certifications, radiation awareness
- Meter connectivity methods
- Technology fundamentals and principles
- Vx meter setup and configuration
- Service Manager software introduction and overview
- Understanding sensitivities and key parameters
- Review of calculation inputs and their role
- Understanding meter sensitivity on inputs, hands-on and tutorials
- Applied sensitivity analysis
- Data verification and meter troubleshooting

Reliability Methodologies Applied to Maintenance

Foundation – 5 Days

This 5-day course provides the knowledge and reliability techniques and methodologies to improve the reliability of production operations by analyzing the inherent principles, concepts, and methodologies of operational reliability and best practices.

COURSE CONTENT
- Reliability methodologies
- Criticality analysis
- Failure mode effect analysis
- Exercises
- Risk-based inspection
- Reliability-centered maintenance
- Exercises
- Root cause analysis
- Risk-cost-benefit analysis
- Risk analysis: from deterministic to probabilistic
- Risk matrices
- Exercises
- Reliability integral system
- Reliability based on conditions
- Risk propagation
- Exercises
- Strategy for a reliability integral system
- Real case exercises

AUDIENCE
Maintenance and reliability engineers, maintenance planners, surface facility operation engineers, production engineers

PREREQUISITE
None
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

Gas Conditioning and Handling

Foundation – 18 Days

The goal of this course is to provide attendees with the necessary knowledge and tools for production fluid separation and equipment design. Participants will also gain an understanding of the best conditions for an efficient operation of gas sweetening, dehydration, compression, and transportation. This course will allow the attendees to participate in the diagnostic and identification of key variables for an optimum operation. All this will result in an increase in the effectiveness of the personnel, reduction of operational costs, and optimization of the performance of gas conditioning and handling.

COURSE CONTENT

• Overview of gas properties
• Gas separation
• Design and operation of the separation system
• Gas-sweetening process classification
• Selection criteria for sweetening processes
• Design and operation of sweetening processes
• Typical operating problems and troubleshooting for amine process
• Hydrate
• Gas dehydration processes
• Design and operation of gas dehydration processes
• Typical operating problems and troubleshooting for triethylene glycol (TEG) unit
• Liquid removal
• Gas transportation
• Compressors
• Pumps
• Heat exchangers

AUDIENCE
Surface facility design engineers, surface facility operations engineers, gas processing engineers, and field production operations engineers

PREREQUISITE
Awareness of natural gas properties

Utilities: Design and Operations

Foundation – 10 Days

This comprehensive course encompasses a large number of different types of utility systems: water, steam, air, nitrogen, fuel, electric power, flare and vent, drain, water treatment, storage, and loading. For each type of utility, the attendees will learn about the relevant support systems, layout, design, reliability, key specifications, and applications.

COURSE CONTENT

• Service, cooling, fresh, potable, and demineralized water
• Air systems and nitrogen systems
• Design drawings: Sample process and instrumentation, utility flow, and process layout
• Specifications: Mechanical drawings and datasheets
• Fuel, electric power, and emergency power systems
• Flare and vent systems
• Drain systems
• Water treatment systems
• Support systems and components
• Designs, equipment, and technologies
• Operation, maintenance, and safety

AUDIENCE
Process engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, and surface facilities project engineers.

PREREQUISITE
Basic understanding of production facilities and operations.

Risk and Reliability Engineering

Foundation – 5 Days

Reliability and risk analyses can be applied to surface facilities production systems to qualify and quantify risks at all levels: one piece of equipment, one process, or a complete system. Attendees will learn to apply these analyses to forecast failures and calculate the associated economic impact. This course focuses on practical application of theoretical techniques through real-world in-class exercises.

COURSE CONTENT

• Risk analysis and reliability engineering
• Uncertainty determination and management and deterministic and probabilistic models
• Integrated reliability analysis
• Statistics for risk and reliability analysis
• Use of tools (RARE™ and Crystal Ball™) for goodness-of-fit tests and Monte Carlo simulation
• Reliability, availability, and maintainability analysis for repairable equipment
• Methods for availability and calculation of expected number of failure events for repairable equipment
• Forecasting failures and availability of an ESP installation
• Principles of economic analysis: Projected cash flow, discount rate, net present value (deterministic model and probabilistic model)
• Risk analysis: Dimensioning risk for undesirable events, qualitative and semi-quantitative methods for risk analysis, quantitative risk analysis and ESP installation example
• Determining risk mitigation actions
• Risk and profitability matrix

AUDIENCE
Engineers responsible for assessing, quantifying, or predicting failures in production operations equipment or facilities.

PREREQUISITE
General knowledge of maintenance and reliability concepts.

Maintenance Integrated Planning

Foundation – 5 Days

This course teaches an integrated approach to the maintenance planning process. Attendees learn how to apply techniques and tools to develop a strategy for maintenance organization and use cost-risk-benefit analyses to maximize value creation and quantify uncertainty.

COURSE CONTENT

• World-class maintenance
• Maintenance value chain and responsibilities
• Maintenance engineering

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Maintenance planning and programming execution
• Risk in maintenance planning
• Maintenance control planning
• Strategic direction of maintenance tasks
• Risk definition
• Uncertainty quantification and propagation
• Generic strategy
• Maintenance planning (portfolio matrices) definition

**AUDIENCE**
Engineers, planners, and managers responsible for maintenance program planning or implementation.

**PREREQUISITE**
Introduction to Maintenance and Reliability course or equivalent experience.

### Instrumentation and Control Basics

**Foundation – 5 Days**

This 5-day course covers areas pertaining to the instrumentation, basic control system, and components (sensors, input/output elements, controllers, final control elements) of surface facilities. Specific instrumentation and controls for pressure, temperature, flow, level, density, control valve, and field data acquisition systems will be covered. This course will go on to explain the basic working principles, measuring devices, operations, and specifications of surface facilities.

**COURSE CONTENT**
• Standard instrument symbols and abbreviations
• Process control basics
• Measurements of process variables
• Pressure control devices
• Sensors and transmitters
• Controllers and control valves
• Measurement instruments
• Classifications
• Range of operations
• Liquid flow rate metering and control system
• Gas flow rate metering and control system
• Local control systems
• Distributed control system (DCS)
• SCADA

**AUDIENCE**
Process engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, and surface facilities project engineers

**PREREQUISITE**
Basic knowledge of production surface facilities.

### Introduction to HYSYS Software in Oil and Gas Processing

**Foundation – 5 Days**

In this course you will learn how to use HYSYS® Aspen Technology software to model different oil and gas processes for the design analysis and to evaluate the performance of existing oil and gas facilities, process equipment and plants. Attendees will complete the preliminary process flow diagrams, mass and energy balance, and equipment sizing based on HYSYS operations, and extension objects that allow custom unit operations, kinetic reactions, and property packages to be incorporated into HYSYS Simulation. The attendees will also learn how to build, navigate and optimize process simulations using HYSYS software.

**COURSE CONTENT**
• HYSYS overview and applications
• Fluid and transport properties
• Oil and gas property simulation using HYSYS
• Thermodynamic selection
• Process flow diagrams
• Material and energy balances
• Customized reports and applications
• Oil, gas, and water separators
• Pump and compressors
• Valves, fittings, and pipelines
• Oil pumping and transportation
• Gas compression plant
• Oil stabilization plant
• NGL extraction by mechanical refrigeration

learn how to apply maintenance and reliability concepts to generate a well-planned predictive maintenance program in addition to increasing their knowledge of information and reliability methods that can be used to create a prognosis of equipment components, equipment, plants, and assets for any subsurface-surface production system or subsystem.

**COURSE CONTENT**
• Maintenance: Philosophy and types
• Preventive maintenance plan
• Work request, work order, maintenance forms, and reports
• Maintenance system design
• Reliability: Engineering, availability, durability, and maintainability
• Types of failure
• Reliability: Block analysis; series, parallel, and combination systems
• Principles of failure mode and effects analysis
• Risk-based inspection principles
• Reliability-centered maintenance principles
• Risk-cost benefit model definitions
• Reliability strategy and methodology selection

**AUDIENCE**
Maintenance managers, operations personnel, and engineers interested in assessing maintenance reliability or establishing procedures for reliability assurance.

**PREREQUISITE**
Basic knowledge of production surface facilities.
**Crude Oil and Water Treatment**

*Foundation – 5 Days*

This course covers oil and water-treating equipment, design, and operations encompassing the theories, technologies, and examples. Attendees will learn the primary challenges faced in crude oil handling, including emulsion formation (both theoretical and actual examples), stabilization, and the mechanism and technology used to destabilize and separate water from oil in addition to the use of desalting technologies and processes to bring produced fluids to required oil specifications. The attendees will learn about the technologies, processes, and operational conditions employed to treat produced water to required specifications.

**COURSE CONTENT**
- Oil treatment fundamentals
- Emulsion theory
- Crude oil dehydration equipment
- Crude oil desalting

**AUDIENCE**
Process engineers, mechanical engineers, instrumentation and control engineers, surface facilities, project engineers (Special instructions: Company represented by the attendees must have HYSYS software licenses).

**PREREQUISITE**
None

**Introduction to Flow Assurance**

*Foundation – 5 Days*

This course introduces attendees to the main types and causes of flow impediments along with the methods and technologies commonly applied for their prevention, control, and remediation. Increase your understanding of the main problems associated with flow assurance, including asphaltenes, paraffins, emulsion, scales, sand, slugging, corrosion, and hydrates. The attendees will learn which technologies and techniques to use for specific problem environments and the advantages and disadvantages of each in addition to learning how to identify the types and causes of flow impediment and the methods or technologies that should be applied for the prevention, control, and remediation of these flow impediments.

**COURSE CONTENT**
- Flow assurance principles and fundamentals
- Inorganic scale: Deposition principles, prediction, modeling, management program design, and scale prevention
- Hydrates: Deposition principle, impact, hydrate detection, control, and remediation
- Paraffins (wax): Deposition principle, properties, factors affecting deposition, operational problems, control, and remediation
- Asphaltenes: Key properties, deposition mechanism, modeling, effect of variables, operational problems, prevention, and remediation
- Emulsions: Crude oil natural surfactants, characteristics, and treatments
- Corrosion: Factors influencing oilfield corrosion and their control

**AUDIENCE**
Engineers responsible for assessing, diagnosing, or troubleshooting flow assurance problems in an operational or design capacity.

**PREREQUISITE**
General knowledge of oil and gas production systems and crude oil properties.

**Gathering System and Network**

*Foundation – 5 Days*

The goal of this course is to provide participants with an integrated vision of the oil and gas production during the life cycle of the asset. With this vision, along with knowledge of the properties and flow of fluids provided, participants will be able to understand the behavior of fluids in the gathering system during its life cycle. This 5-day course strongly emphasizes the calculation of fluid properties and phase behavior from the reservoir to the gathering network. This knowledge will be necessary for surface facility engineers designing and operating the equipment and facilities. Specific topics that will be covered during this course include integrated production systems, hydrocarbon properties, flow of fluid basic concepts, pressure drop for gas or liquid, and flow pattern correlations for horizontal pipes.

**COURSE CONTENT**
- Production systems overview
- Basic concepts of fluid flow
- Single and multiphase flow
- Gathering systems
- Pipeline fundamentals
• Onshore, offshore, and subsea manifolds
• Water injection systems
• Gathering and distribution systems design criteria
• Backpressure, pressure drop, and erosion velocities criteria
• Erosion velocities calculations
• Network simulation
• Using PIPESIM to build network models
• Pipeline and gathering workshop simulation
• Using PIPESIM to simulate gathering network
• Company cases

AUDIENCE
Surface facility design engineers, surface facility operations engineers, production managers, and field production operations managers

PREREQUISITE
Awareness of surface facilities production system

Surface Facility Production Operations

Foundation – 5 Days

Field development processes are closely associated with surface facilities engineering processes, gathering systems, and fluid treatment, transportation, measurement, and storage. This course focuses on the physical characteristics of natural gas and oil and their effects on separation, treatment, and measurement. Exercises include the design and operation of surface production equipment and processes.

COURSE CONTENT
• Asset development and life cycle
• Properties of production fluids
• Production system analysis
• Oilfield fluids
• Effects of fluid properties on production system
• Principles of operation
• Manifold and gathering systems and flowlines
• Fluid flow: Single phase and multiphase (correlations, flow pattern, and pressure drops)
• Piping: Design, operations, and purposes
• Separators: Two and three phases, horizontal or vertical, and separation stages
• Gas conditioning: Dehydration and sweetening
• Oil treatment: Fundamentals, dehydration, desalting, emulsion, equipment, and operations
• Water treatment: Properties of produced water, equipment, technologies, treatment processes and chemicals
• Corrosion considerations: Internal (CO2, H2S, oxygen, material selection, mitigation) and external (material selection and mitigation)

AUDIENCE
Engineers and managers wanting to understand production operations facilities from an engineering perspective.

PREREQUISITE
Basic knowledge of production systems and hydrocarbon properties.

Health, Safety, and Environment in Exploration and Production

Foundation – 3 Days

This course presents comprehensive HSE methods and tools used for development of risk management processes. Attendees will learn how to improve the safety of operating conditions at production facilities, minimize the risk in emergency situations, and establish proactive mitigation strategies.

COURSE CONTENT
• Risk management: Basic definitions, occupational health plan, risk recognition, unsafe act, and risk-generating source
• Risk evaluation objectives
• Risk magnitude determination
• Exposure results with clinical investigation relation
• Risk-control methods and their effectiveness
• Sampling strategy, plan, and methods
• Sample analysis: Direct-measurement tools and continuous sample analysis
• Risk control
• Risks at work administration
• Accidents: Causes, results, and occupational and disease management
• HAZID: HAZOP analysis, qualitative methods for risk analysis, human error analysis, accident scenarios, natural threats, and preparation for emergencies
• Case identification and evaluation and emergency control

AUDIENCE
Engineers and HSE specialists interested in establishing systematic HSE procedures.

PREREQUISITE
Basic knowledge of exploration, development, and production operations.

Oil Processing and Conditioning

Foundation – 10 Days

This 10-day course covers the oil processing and conditioning of a surface facilities system. Participants will learn about the system all the way from the wellhead to the delivery of a specific oil product. They will learn how to select and evaluate processes and equipment used to meet fluid specifications and how to apply physical and thermodynamic property correlations. They will also learn about the principles of the design and evaluation of oil production and processing facilities, how to perform equipment-sizing calculations for major production facility equipment, and how to evaluate processing configurations for different applications.

COURSE CONTENT
• Oil production and processing overview
• Wellhead and equipment
• Gathering systems and separation stations
• Phases of separation
• Scrubbers and separators
• Dehydration and desalting
• Emulsion theory
• Gravity separation and viscosity
• Dehydration equipment
• Design and sizing calculations
• Oil heaters
• Oil desalting principles
• Equipment and technology
• Operation and design considerations
• Crude oil stabilization and sweetening
• Vapor pressure fundamentals
• Sour and sweet oil concepts
• Crude oil storage and vapor recovery units
• Types of storage tanks
• Processing configurations and infrastructure impact
• Field trip
• Final evaluation

AUDIENCE
Process engineers, mechanical engineers, instrumentation and control engineers, and surface facilities project engineers

PREREQUISITE
An awareness of the surface facilities production system

Gas and Oil Pipeline Operations

Foundation – 5 Days

In this 5-day course, participants will gain the necessary knowledge to demonstrate the principles of pipeline operation and maintenance in a mechanical and technological environment. The course is designed to provide participants with a basic understanding of maintenance procedures, as well as the related operations of pipelines and their associated equipment.

COURSE CONTENT
• The need for pipelines
• Pipeline terminology
• Pipeline project life cycle and planning
• Review of pipeline systems
• Pipeline codes, standards, and national regulations
• Pipeline engineering
• Pipeline design
• Pipeline construction
• General material requirements
• Hydrotesting
• Pipeline repairs
• Pipeline pigging system: pigs, services, components
• Type of pigs: use and operation
• Block valves
• Routine operational/maintenance activities
• Fundamentals of corrosion
• Factors influencing oilfield corrosion
• Operation, inspection, and maintenance
• Pipeline integrity management
• Fitness for service assessment

AUDIENCE
Process and production staff, engineering staff, managerial staff, maintenance engineers, and project/construction engineers

PREREQUISITE
Surface facilities production operations

Piping and Pipeline Design, Maintenance, and Operation

Foundation – 5 Days

The objective of this course is to help participants gain a comprehensive knowledge of elements that are essential to the design, operation, and maintenance of pipelines. The design of the gathering network, pressure drops, fluid pattern, and network arrangement will be discussed in detail. A gathering network simulator (Pipesim or equivalent) will be used to obtain the best operating and design conditions for the system. The course will also provide a practical way to learn about the elements considered in the design, code, legislation, material selection, corrosion (internal and external) considerations, and management. Hydrotesting, pigging, pipeline integrity analysis using inspection survey, monitoring data, fitness for purpose, risk analysis, and predictive and preventive maintenance will also be covered.

COURSE CONTENT
• Pipeline preparation
• Pipeline code and standards
• Preliminary survey
• Flow of fluid in pipelines
• Multiphase flow
• Two phase
• Flow pattern maps
• Flow system
• Troubleshooting
• Gathering system
• Pipeline configuration

Not available
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

• Pipeline design
• Location classification
• Pipeline construction
• Hydrostatic test
• Corrosion considerations
• Pipeline operation
• Coating monitoring and inspection
• Pigging
• Integrity management

AUDIENCE
Pipeline engineers, operations and maintenance staff, surface facility design and operation engineers, production managers, and maintenance managers

PREREQUISITE
Awareness of oil and gas production system, flow of fluids, API 5L standard, ASME 31.3, 31.4, and 31.8 standards

OLGA Advanced Flow Assurance

Advanced – 3 Days

his course mixes lectures and hands-on exercises to help attendees understand the OLGA software background and widen the scope of applications of transient multiphase simulations for flow assurance. The exercises are conducted within the frame of the OLGA GUI. All major features of the GUI are covered, including model building, case runs, parametric studies, and postprocessing. The PVTsim software is used to generate hydrate curves and wax tables.

COURSE CONTENT
• Fluids and compositional tracking with OLGA simulator and PVTsim software
• Pipeline profile modeling
• Liquid surges and controller basics
• General guide to separator modeling and sizing
• Hydrates and MEG tracking
• Slug mitigation by control
• Gas lifting
• Well-flowline-riser shut-in and cool-down with hydrate inhibition
• Wax deposition, pigging, and dead-oil circulation
• Overpressure protection
• Water hammer

AUDIENCE
Experienced OLGA simulator users who are interested in learning about advanced applications for flow assurance and modeling of more complex systems within the software.

PREREQUISITE
OLGA Flow Assurance course and preferably previous project experience with OLGA software.

OLGA Fluid Handling

Advanced – 1 Days

This one day workshop combines lectures and hands-on examples to better understand the various options that are available in OLGA to simulate the fluid phase behavior and physical property predictions. The workshop shows how to use the various options, and, more importantly, when to use them and when not to use them.

COURSE CONTENT
• Use of PVT tables, including generation of tables using Multiflash
• Discussion of Compositional Tracking and example on its use
• Several examples showing problems where Compositional Tracking is essential to properly model the system
• Discussion of Black Oil Modeling and an example on its use
• Discussion of the uses and limitations of Black Oil Modeling
• Discussion of the Single Component Model
• Several exercises using the Single Component Model
• Discussion of the uses and limitations of the Single Component Model
• Discussion of Inhibitor Tracking in OLGA
• Discussion of the Complex Fluids module in OLGA and an exercise showing its use
• Use of the Fluid Definition Tool for drilling fluids
• Miscellaneous fluids topics in OLGA

AUDIENCE
Experienced OLGA users who are interested in learning more about the use of the various fluids handling models in OLGA.

PREREQUISITE
Workshop attendees need a working knowledge of the basic OLGA. One year or more experience with the program preferred.

Avocet for Administrators

Foundation – 3 Days

Attendees will learn how to use the flexibility of the Avocet software platform Volumes Manager module to build custom solutions for managing production information. The attendees will understand how to deploy and configure the software for all types of operational settings: conventional land, offshore; deep offshore, floating production, storage, and offloading vessels, coalbed methane, SAGD, and heavy oil. This course will increase your understanding of features for data entry, visualization and computation of production, allocation of fluids, and operational and regulatory reporting.

COURSE CONTENT
• Facility setup, completions, wells, equipment, and other processes
• Organizational and other hierarchies using links
• Allocation networks
• Data loaders
• Calculations and allocation processes
• Disconnected data collection setup
• Security definition
• Reports through Microsoft SQL Server reporting services

Note: This course can be customized to include training on the Avocet Volumes Manager System Development Kit, which covers advanced implementation and configuration topics, such as modifying the transaction system, adding new screens, setting up unit conversions, localizing the software, and setting up reporting views.

AUDIENCE
Anyone wanting to configure or administer an Avocet Volumes Manager system for end users.

PREREQUISITE
Avocet Volumes Manager for End Users course or equivalent.
OLGA Well Dynamics
Foundation – 5 Days

This 5-day course is intended to train the attendees who work with production and well performance to use the OLGA simulator to simulate the flow transients in the wells and production systems. This course is very suitable for engineers who would like to simulate the offshore well operation scenarios. The course has a good balance in content between the well flow dynamics and the hands-on OLGA simulator skill learning. This course also helps the new OLGA beginners to quickly grasp the “dynamic” concept, gain basic skills to use OLGA simulator independently, and lay a solid foundation for building up advanced modeling capabilities.

COURSE CONTENT
- OLGA simulator well modeling capability
- The OLGA simulator model and its execution
- Numerical solution scheme and sectioning principles
- PVT aspects in OLGA simulation and PVtsim OLGA interface
- Well model building in the OLGA simulator
- Artificial lift modeling with OLGA simulator software
- Mud and well engineering fluid modeling and applications
- Steady-state simulation and parametric study
- Shut-in and startup
- Simple gas-lift modeling
- Electric submersible pump modeling
- Wellbore cleanup
- Blowout and well kill (optional)

AUDIENCE
Production and well performance engineers, especially suitable for offshore well operation scenarios.

PREREQUISITE
No previous OLGA simulator experience is necessary, but knowledge of well performance and multiphase flow modeling advantageous.

Pipesim Gas Field Production Operations
Foundation – 2 Days

This course covers the use of the Pipesim production system analysis software steady-state multiphase simulator for designing and modeling gas production systems operations. Practical and comprehensive problems will be presented, discussed, and analyzed throughout the course.

COURSE CONTENT
- Navigate the Pipesim simulator user interface
- Troubleshoot and debottleneck network models
- Model gas wells, including various completion models
- Match inflow performance to test data
- Model water separation, injection into a salt water disposal well, and wellhead or manifold production sources
- Construct a compositional fluid model
- Predict gas hydrate formation, erosion, corrosion, and liquid loading in gas wells
- Model centrifugal and reciprocating gas compressors
- Compare the relative benefits of push vs. pull compression
- Estimate the required slug catcher size
- Model a transmission network

AUDIENCE
Software developers who require practical training in how to customize Avocet to extend its capabilities

PREREQUISITE
Attendees should have medium to strong C# development experience. Attendees will work in Visual Studio 2013. Prior knowledge of Avocet would be useful, but is not required.
Includes practical sessions
Uses simulation

**Immersive Learning Programs**

**COURSE OFFERINGS**

**OLGA Flow Assurance**

**Foundation – 3 Days**

This 3-day course is intended to turn a beginner into an OLGA simulator user, capable of running realistic flow assurance tasks. A mixture of lectures and hands-on exercises helps attendees understand flow assurance challenges, the fundamentals of multiphase pipeline thermo-hydraulics, and how to apply the OLGA simulator in realistic flow assurance issues. The exercises are conducted using the OLGA GUI. All major features of the GUI are covered, including model building, case runs, parametric studies, and effective post-processing. Fluid property tables for the OLGA simulator are generated with the PVTsim third-party compositional PVT analysis and characterization software. Our experienced instructors focus on teaching the attendees how to turn data into an acceptable and effective OLGA model and how to perform simulations.

**COURSE CONTENT**

- Basic multiphase production hydraulics and thermal issues
- Introduction to OLGA simulator topology and basic assumptions
- Introduction to PVTsim software
- Flow assurance issues for oil and gas-condensate production
- Terrain slugging mitigation, hydrodynamic slugging and OLGA slug tracking
- Shut-in, cool-down, startup, and depressurization of a well-flowline-riser configuration
- Building a simulation model with minimum information
- Gas condensate pipeline-modeling characteristic steady-state behavior, pigging, turnaround, ramp up, three-phase flow, separator with level control

**AUDIENCE**

Beginner to intermediate OLGA simulator user, prospective OLGA simulator licensee, and the design or operations professional interested in exploring the uses and capabilities of multiphase transient simulations.

**PREREQUISITE**

No previous experience with OLGA software is necessary, but a general knowledge of pipe flow and thermodynamics is an advantage.

**OLGA Flow Assurance**

**Foundation – 5 Days**

During this five-day course, you will learn how OLGA dynamic multiphase flow simulator is used to understand and solve typical flow assurance challenges. This interactive and practical course includes step-by-step instructions to build and run simple transient simulation models. Key operational procedures are covered, like shutdown, start-up and pigging. Best practices and workflows are also presented for liquid and hydrate management, slugging recognition and mitigation, and fluid handling in OLGA.

**COURSE CONTENT**

- Introduction to multiphase production hydraulics and thermal issues
- Introduction to OLGA GUI
- Fluid handling in OLGA
- Introduction to the Flow Assurance concept
- Simulation of terrain slugging mitigation, hydrodynamic slugging and usage of OLGA Slug tracking
- Construction of a well-pipeline-riser oil system to simulate typical operational scenarios like shut-in, cool down, start-up and depressurization
- Simulation of liquid accumulation and pigging in gas condensate pipeline
- Evaluation of hydrate formation risk and inhibition
- Modeling separators and controllers in OLGA
- Modeling a pipeline using the Pipeline editor
- Introduction to advanced thermal modeling options

**AUDIENCE**

Anyone interested in gaining a general understanding of OLGA dynamic multiphase flow simulation to address flow assurance challenges, or beginner to intermediate OLGA users who want to explore OLGA advanced workflows and tools.

**PREREQUISITE**

No previous experience with OLGA is necessary, but a general knowledge of pipe flow and thermodynamics is an advantage.
PIPESIM Fundamentals

Foundation – 2 Days

In this course, attendees explore the PIPESIM production system analysis simulator software which provides steady-state, multiphase flow simulation for oil and gas production systems. Individual PIPESIM modules are used for a wide range of analyses, including well modeling, nodal analysis, field planning, artificial lift optimization, and pipeline and process facilities modeling. A major feature of PIPESIM software is the system integration and openness that allows users to develop a Total Production System Model. The attendees will gain a general understanding of how PIPESIM software is used to design and optimize total production systems from the reservoir to the final processing delivery point.

COURSE CONTENT

- Analyze well performance
- Design of models for pipeline and process facilities
- Perform nodal analysis
- Develop blackoil and compositional fluid models
- Select multiphase flow correlations
- Surface network model

AUDIENCE

Anyone who needs to learn steady-state, multiphase flow simulation for oil and gas production systems to analyze well performance, model pipelines and facilities, and perform nodal analysis using PIPESIM software.

PREREQUISITE

None

Production Chemistry (virtual course)

Foundation – 3 Days

This course is delivered in 4 hours period over three days, it is delivered by virtual means. The goal of this course is to allow the participants to be familiarized with the chemical used in the upstream oil and gas production system. Chemical has been used in Oil and gas industry to assure the flow in the production system which requires several chemicals to maintain production. The course includes the methods of selection of chemical for corrosion, emulsion, foam, inorganic scale, wax, asphaltenes and hydrates.

COURSE CONTENT

- Corrosion
  - Classification
  - Corrosion mechanism
  - Determination of the corrosion rate
  - Corrosion prediction
  - Corrosion Inhibitors
  - Corrosion monitoring techniques
  - Emulsion and foam
  - Crude oil natural surfactants
  - Crude oil Natural Surfactants Composition and Structure
  - Emulsion
- Foam Formation
- Scale
  - Oilfield scale
  - Type of scale
  - Principles and fundamentals:
  - Scale deposition mechanism
  - Control and remediation
  - Scale inhibitor selection
  - The design of field scale management program
  - Case Study
- Hydrates
  - The problem
  - Deposition site
  - Control and remediation
  - Gas hydrates definition
  - Hydrates mechanisms
  - Hydrates detection
  - Hydrates control and remediation
  - Inhibitor selection
- Paraffins
  - Characteristics: Composition, structure and properties
  - Mechanisms
  - Tests
  - operational problems
  - Control and remediation and Monitoring
  - Chemical evaluation and selection
- Asphaltenes
  - Key properties
  - Deposition mechanism/model
  - Effect of variable on deposition
  - Deposition causes
  - Operational problems
  - Prevention and remediation
- Chemical in water treatment
  - Polyelectrolyte
  - Coagulant/Clarifier
  - Antifoam
  - Oxygen scavenger
  - Biocide
- Recent development of environmental friendly chemicals
# Information Management

NEXiT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted. There are some courses that use simulators and are highlighted with.

## SOFTWARE

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**Foundations**: Studio for Petrel Users

**Awareness**: Studio for Petrel Users

**Skill**: Studio Manager - Petrel

**Advanced**: Studio Manager: SQL Server Environment

**Simulators**: Uses simulation

**Includes practical sessions**: Includes practical sessions

**Field trips**: Field trips
**ProSource Front Office Administration**

**Advanced – 3 Days**

This course provides attendees with details and an understanding of the tasks required to administer and configure the ProSource Front Office data management and delivery system. The course covers details of the procedures needed to administer user accounts, projects, maps, modules (wells, logs, and seismic), and reports.

**COURSE CONTENT**

- Outline ProSource Front Office architecture and application interface to access data
- Create and configure user and project
- Configure map
- Summarize the concept and configure the data scope restriction
- Create and configure report
- Create and configure a new form/window

**AUDIENCE**

Petrotechnical data administrators, data loaders, data managers, and technical IT personnel with Data Management delivery responsibilities.

**PREREQUISITE**

ProSource Front Office Fundamentals course or working experience with ProSource Front Office software.

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**eSearch Administration**

**Advanced – 2 Days**

In this course, attendees will learn how to administer and manage the eSearch application server and data model. They will explore how to perform advanced administration workflows and system configurations including data modeling, reference lists creation, attachment storage manipulation, users and security profile creation and management. How to achieve external search configuration, produce system reports, perform language customization, use the administration toolkit, configure and manage retention (disposal) policies will be reviewed.

**COURSE CONTENT**

- Organizational structure and the data model creation process
- Configuration settings for a new customer, including customer branding, reference lists, preferences and other miscellaneous parameters
- Security model requirements and functional components, including users, security profiles, LDAP, Active Directory integration and row level security
- Web administration functionalities including attachment storage and external search (launch web in context) configurations
- Built-in system reports and the Administration toolkit utility to monitor and administer the system
- Retention policies and events management

**AUDIENCE**

Petrotechnical data administrators, data loaders, data managers, and technical IT personnel with Data Management delivery responsibilities.

**PREREQUISITE**

ProSource Framework Fundamentals course or working experience with ProSource Framework environment.

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**ProSource Logs Advanced**

**Advanced – 3 Days**

This course provides attendees with details and an understanding of the tasks required to generally configure and administer the ProSource application environment such as start-up processing, user management and roles, and security. It also guides attendees through the steps to personalize the ProSource environment - such as customizing data sources, data views and data queries, enabling virtual shapes, or launching external applications in context and bring focused efficiencies and usability to the community of ProSource system users.

**COURSE CONTENT**

- Prepare and validate the ProSource system run-time environment
- Use the IM Administration Console
- Create and manage user accounts
- Create and assign user roles
- Establish security and test policies
- Tailor the ProSource Tree – modify, create or remove topics, views, queries
- Define custom data sources and capabilities and learn the Viewloader
- Set up related data and pick lists (drop lists)
- Establish access to geographic coordinate data and virtual shapes
- Configure and launch external applications in context

**AUDIENCE**

Petrotechnical data administrators, data loaders, data managers and any other data management professional who will be responsible for configuring, personalizing and administering ProSource Framework environment.

**PREREQUISITE**

ProSource Framework Fundamentals course or working knowledge of ProSource system software, and an understanding of UNIX systems administration, Apache, Tomcat, and SQL applications.

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**ProSource Front Office Administration**

**Advanced – 3 Days**

This course expands on the ProSource Framework Fundamentals course. As a common application framework solution for data management, the ProSource system is highly configurable to meet business and workflow needs. This course provides an understanding of the tasks required to generally configure and administer the ProSource application environment such as start-up processing, user management and roles, and security. It also guides attendees through the steps to personalize the ProSource environment - such as customizing data sources, data views and data queries, enabling virtual shapes, or launching external applications in context and bring focused efficiencies and usability to the community of ProSource system users.

**COURSE CONTENT**

- Prepare and validate the ProSource system run-time environment
- Use the IM Administration Console
- Create and manage user accounts
- Create and assign user roles
- Establish security and test policies
- Tailor the ProSource Tree – modify, create or remove topics, views, queries
- Define custom data sources and capabilities and learn the Viewloader
- Set up related data and pick lists (drop lists)
- Establish access to geographic coordinate data and virtual shapes
- Configure and launch external applications in context

**AUDIENCE**

Petrotechnical data administrators, data loaders, data managers and any other data management professional who will be responsible for configuring, personalizing and administering ProSource Framework environment.

**PREREQUISITE**

ProSource Framework Fundamentals course or working experience with ProSource Front Office software.
PREREQUISITE
ProSource Logs Fundamentals course or working experience with ProSource Logs System.

ProSource Enterprise Advanced
Advanced – 3 Days

This course provides attendees with an overview and understanding of the tasks required to administer and configure the ProSource E&P data management system and the Seabed E&P open data and delivery model and database. The course details the procedures needed to administer and create various Seabed accounts, manage advanced data loading scenarios, create custom coordinate systems, synchronize existing projects, extend the Seabed data model, and configure miscellaneous parameters like reports, job scheduler, etc. This course will help the attendees design advanced data loading and validation workflows for any custom E&P data needs.

COURSE CONTENT

• Outline ProSource Enterprise architecture and application interface to access data
• Describe various roles that control data access and validation
• Summarize Seabed database administration, including procedures to extend the Seabed data model
• Create projects, dictionaries, interfaces, and staging areas (temporary areas used during data loading)
• Create control files to support customized data loading scenarios
• Coordinate system considerations during data loading
• Summarize utilities and configurations to synchronize projects (data copy/update)
• Creation of customized Excel reports
• Manage temporary files created during loading/exporting and their cleanup
• Configure job scheduler, e-mail notifications (used during loading/exporting) and license parameters

AUDIENCE
This course is intended for petro-technical data administrators, data loaders, data managers, and any other data management professionals involved with corporate data management who need a deeper understanding of the ProSource Enterprise configuration, administration, and advanced workflows.

PREREQUISITE
ProSource Enterprise Fundamentals course or a basic working experience of ProSource Enterprise system.

ProSource Seismic Advanced
Advanced – 3 Days

This course presents the advanced concepts and workflows for the ProSource Seismic module, which is a part of ProSource E&P Data Management Suite. You learn how to manage seismic and navigation data, along with related documents in seismic archives and in interpretation projects. This training is an overview of functionalities for advanced data export workflows and the procedures needed to configure, administer, and troubleshoot ProSource Seismic. This training shows you how to efficiently use ProSource Seismic for managing seismic data. Lessons and exercises focus on practical applications and help participants apply new skills immediately.

COURSE CONTENT

• Create ProSource users and assign application roles to users
• Manage information about application users using the Business Associates submodel
• Export data using spatial entitlements and various techniques for spatial data cutting workflows
• Perform administrative tasks, including but not limited to setting up e-mail notifications, configuring and managing distributor, coordinate reference system (CRS) aliases and export jobs
• Explore the ProSource Seismic data model and use it for quality control and troubleshooting
• Configure the ProSource Seismic module using the Information Management Administrator console

AUDIENCE
Petrotechnical data administrators, data loaders, data managers, and any other data management professionals involved with corporate seismic data that need a deeper understanding of the ProSource Seismic configuration, administration, and advanced workflows.

PREREQUISITE
ProSource Seismic Fundamentals course or working experience in ProSource Seismic software in addition to a general knowledge and understanding of concepts related to the Linux operating system and Oracle databases.

ProSource Front Office Fundamentals
Skill – 2 Days

This course introduces attendees to ProSource data management and delivery system Front Office, an easy-to-use web-based application that provides workflow-based data delivery in two important methods. These methods are efficiently delivering log data directly into the Petrel platform and Techlog platform projects by means of plug-ins, allowing users to search and visualize exporting data from the ProSource system through a lightweight web interface. The ProSource Front Office package interfaces with ProSource Logs, ProSource Enterprise, and ProSource Seismic software systems.

COURSE CONTENT

• Initiate the ProSource Front Office system and navigate the interface
• Search for and browse well information, deviation surveys, markers, perforations, checkshot surveys, core intervals, VSP surveys, and seismic data
• Interrelationship of ProSource Front Office windows software
• Use a variety of features in different windows, including map, log viewer, log pass viewer, EBCDIC header and the visualization and rotation of 3D deviation graphics
• Export log data into standard format (LAS/LIS/ODLIS)
• Download well, VSP, and seismic data files and associated documents
• Transfer data to Petrel platform suite and Techlog software using the associated ProSource Front Office plug-in
• Log data and associated documents data submission from ProSource Front Office software to ProSource Logs systems
• End-user workflows

AUDIENCE
Geoscientists, petroleum engineers, data managers, and technical IT personnel with data management delivery responsibilities.

PREREQUISITE
Advanced workflows.

Practical Real Time Operations for Well Construction with InterACT and Petrel
Skill – 4 Days

This course focuses on enabling successful delivery and utilization of real time data from drilling operations. Starting with the fundamentals of connectivity and bandwidth requirements for different data sources it will then moves on to cover the most widely used data formats. Focusing on WITS* and WITSML** data, hands on exercises will...
show the advantages and limitations of these common data formats. The course will also detail the recent developments and technical advantages of adopting the WITSML standard. Attendees will learn how to optimize display of real time data via a browser based system using “InterACT” and then learn, using “Petrel”, the concept and advantages of delivering real time data to desktop application using the WITSML API.

**COURSE CONTENT**
- Connectivity and Data Sources
- Module 1: Telecommunications
- Satellite Connectivity
- Terrestrial Connectivity
- Bandwidth Requirements / Network Management
- Module 2: Real time Data Sources
- Surface data
- Downhole data
- Data delivery formats and methods
- Module 3: Data Delivery
- Dealing with WITS (Wellsite Information Standard) Data
- The WITSML Standard, development and utilization.
- Other Standards / Data Types
- Data Gathering and Delivery
- Visualizing and Sharing Real Time Data
- Module 4: Application of Real time Data
- Web / Browser based delivery
- Real Time Data in Desktop Applications (WITSML Enabled)
- Real Time data for Geologist, Engineers and the asset team.
- Enabling “Integrated Operations”
- Drilling Optimization and Operations Support Centers (OSC)
- Module 5: Drilling Optimization and Operations Support Centers (OSC)
- Real Time for Drilling Optimization
- Remote collaboration
- Risk & Event data
- Operation Support Centers

**AUDIENCE**
Wellsite and Operations Geologists and Drilling Engineers, Drilling and Sub Surface asset team members and Technical and Support staff actively or planning to make efficient use of real time data from drilling operations.

**PREREQUISITE**
Familiarity with use and / or management of wellsite real time data.

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**InnerLogix DQM Intermediate**

**Skill – 3 Days**

InnerLogix DQM Intermediate course provides a practical approach to the implementation of automated and manual quality control workflows using InnerLogix software technology and following the DQM methodology. Attendees will learn techniques and tools to manage the most common data quality issues in the petroleum upstream industry - how to control the quality of data in operations, and how to improve the basis for analysis and decision-making. The InnerLogix solution suite of tools featured in this course includes: DataLogix, QCPro (QCLogix and QCSync), QCAnalyst, QC Rules Editor, ILXAdmin, and QCSummary.

**COURSE CONTENT**
- Use and value of quality data for trusted analyses and decisions in the industry
- Use of DataLogix toolset to manually analyze, assess, and correct E&P data
- Use of QCLogix and QCSync (QCPro toolset) to automate the assessment, correction, and synchronization of E&P data
- Rule sets for data quality assessment and correction using QCRulesEditor
- Use of ILXAdmin to perform administration tasks, create QCProjects, data links, and run jobs
- Analysis of data quality results and defects using QCAnalyst
- Web-based reports of quality scores using QCSummary

**AUDIENCE**
Corporate data managers, data management professionals, DBAs, IT professionals, and domain experts: Geotechnicians, Geoscientists, and Petroleum Engineers.

**PREREQUISITE**
Basic understanding of the E&P industry and its information management challenges.

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**eSearch Intermediate**

**Skill – 2 Days**

In this course, attendees will learn advanced data processing capabilities for physical and digital asset management using the eSearch E&P Physical Asset System in addition to discovering the key differences between the web and desktop user interfaces and their relevant features applied to asset management workflows. Attendees will also review the ordering and borrowing processes from the physical asset administrator point of view as well as gain understanding of how to perform advanced data loading and edits, including the loading and manipulation of attachments. The attendees will learn how to perform different day-to-day data maintenance tasks and produce asset management reports.

**COURSE CONTENT**
- Desktop and web application interfaces and the key functional components and differences
- Physical assets ordering, borrowing, and custody activity processes
- Bulk data loading, bulk edits, and attachment loading of physical assets information
- Physical assets data maintenance tasks, including insert, copy, amend, and delete records
- Physical asset management reports in various formats

**AUDIENCE**
Data loaders, data managers, and warehouse administrators.

**PREREQUISITE**
eSearch Fundamentals course and a general knowledge of physical asset management.

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**ProSource Logs Fundamentals**

**Skill – 2 Days**

This course teaches attendees the fundamental concepts and workflows required to manage the full lifecycle of well logs data using the functionalities of ProSource Logs technology and Seabed E&P open data model. Attendees will get an overview of the functionalities and the procedures needed to execute specific workflows of browsing, data loading, validation, quality control and exporting of well logs data in various industry standard formats.

**COURSE CONTENT**
- ProSource Logs architecture and application interface to access well log data
**IMMERSIVE LEARNING PROGRAMS**

- Description of various file formats managed in ProSource Logs (DLIS, LIS, LAS, PDS, VSP)
- Load, quality control and validate various well log data formats and standardize data during loading (like curve names, units of measurements etc.)
- Automated batch loading configuration to allow service providers/external applications to load data without using the ProSource Logs interface
- Browse data using tabular or graphical viewers (charts, wellbore viewer, maps)
- Create various reports in user defined templates
- Export data in standard formats (DLIS, LAS, LIS) and managing (cleanup) temporary files created during export
- Manage and search documents and associate them to existing data.

**AUDIENCE**

This course is intended for petro-technical data administrators, data loaders, data managers and geoscientists involved with corporate well logs data who require understanding about the functionalities and workflows supported by ProSource Logs.

**PREREQUISITE**

ProSource Framework Fundamentals course or working knowledge of ProSource software.

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**Studio Manager: SQL Server Environment**

**Skill – 3 Day**

This 3-day course will cover how to use Studio Manager as the single application to manage data in the Studio database for Petrel users, implement and manage collaboration workflows across teams, and apply data management best practices. The data sets and setup provided for the exercises have been designed to work in a SQL Server environment.

**COURSE CONTENT**

- Introduction to Studio and Studio Manager
- Creating repositories, users, roles, create data environments, manage indexes, and quality tags and coordinating reference systems and filters
- Import data: the GUID concept, general transfer rules, transfer messages, data loading in Petrel and data transfer to Studio database, and match rules implementation
- Identifying data issues, managing user attributes and global well logs, and finding and correcting data
- Making repository copies, snapshots, backup, and recovery
- Reviewing application logs
- Overview of Studio database installation, uninstallation, upgrade and, index migration

**AUDIENCE**

Data managers or data Administrators and Petrel platform users with data management responsibilities

**PREREQUISITE**

Petrel Fundamentals and basic proficiency in a Windows operating system, including knowledge about managing Windows services, understanding user accounts and working in a domain, and creating, organizing and sharing folders.

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**ProSource Seismic Fundamentals**

**Skill – 3 Days**

This course presents the fundamental concepts and workflows for ProSource Seismic, which is a part of ProSource E&P data management and delivery system. Attendees will learn how to manage seismic and navigation data along with related documents in seismic archive and in the interpretation projects, using the common ProSource interface for accessing and managing the archive. The course is an overview of the functionalities and the procedures needed when executing the workflows of seismic data loading, validations, quality control, viewing, and exporting. Lessons and exercises focus on practical applications and help participants apply new skills immediately.

**COURSE CONTENT**

- Overview of geodetics concepts, navigation and seismic data formats, numbering systems and basics of 2D and 3D seismic surveys
- Common workflows of ProSource Seismic for data loading, searching, browsing, viewing, selecting and exporting
- Scan, edit, and quality control seismic trace header data
- Load navigation data, seismic data, tape index data, and scanning seismic data available in interpretation projects
- Various data export workflows, inclusive data export from seismic archive to interpretation projects, and data transfer from project to project
- Use ProSource Seismic utilities and set up user accounts for various types of workflows

**AUDIENCE**

This course is intended for petro-technical data administrators, data loaders, data managers and geoscientists involved with corporate seismic data who require understanding about the functionalities and workflows supported by ProSource Seismic.

**PREREQUISITE**

ProSource Framework Fundamentals course or a working knowledge of ProSource software.

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**Studio Manager: Oracle Environment**

**Skill – 3 Days**

This 3-day course teaches participants how to use Studio Manager to effectively support and manage Petrel platform users. The course covers using Studio Manager as the single application to:

- manage data in the Studio database
- implement and manage collaboration workflows across teams
- apply data management best practices.

The data sets and setup provided for the exercises have been designed to work in an Oracle environment.

**COURSE CONTENT**

- Introduction to Studio and Studio Manager
- Creation of repositories, users, roles, create data environments, manage indexes, and quality tags and coordination of reference systems and filters.
- Importing data: the GUID concept, general transfer rules, transfer messages, data loading in Petrel platform and data transfer to Studio database, and match rules implementation
- Identification of data issues, managing user attributes and global well logs, and finding and correcting data
- Making repository copies, snapshots, backup and recovery
- Reviewing application logs
- Overview of Studio database installation, uninstallation, upgrade and, index migration

**AUDIENCE**

Data managers or data administrators and Petrel platform users with data management responsibilities

**PREREQUISITE**

Petrel Fundamentals
• Basic proficiency in a Windows operating system, including knowledge about managing Windows services and creating, organizing, and sharing folders

• Basic proficiency in a Linux operating system, including knowledge about commands to list files, change directories, and view file contents.

**ProSource Enterprise Fundamentals**

**Skill – 3 Days**

This course teaches attendees the fundamentals of and workflows for the ProSource data management and delivery system, which leverages the Seabed® E&P open data model and database system to extend the functionalities of the ProSource data management application. The attendees will receive an overview of the functionalities and the procedures needed to execute specific workflows of data loading, validation, and QC; exporting data; and using utilities. An introduction to the Seabed data model explains its use in the ProSource Enterprise application. Attendees will learn how to use the ProSource application to manage data and understand the architecture supporting the application. Lessons and exercises are designed in a workflow fashion, focusing on practical user needs that let you apply your new skills immediately.

**COURSE CONTENT**

• ProSource Enterprise architecture and integration strategy

• Integrating different data types visually using different data viewers

• Access and browse the Seabed data model and other data sources

• Loading data using a variety of loader functions

• Browsing and validating data

• Exporting data from the Seabed data model to different formats

• Perform data transfers between ProSource Enterprise and GeoFrame/OpenWorks© software

• Using the tools to manipulate and ensure data quality

**AUDIENCE**

Data and information management professionals, data loaders, data managers, and database and IT administrators.

**PREREQUISITE**

ProSource Framework Fundamentals course or working knowledge of ProSource software.

**Studio Manager - Petrel**

**Skill – 3 Days**

Studio Manager comprises a suite of tools for effectively managing the Studio environment. It consolidates administrative and core data management workflows supporting Petrel software. Using Studio Manager, data managers quickly understand the state of their Studio environment by using cutting-edge applications (apps) to ascertain the status of repositories, review recent user activity, identify tasks that need to be performed, and perform the workflows surrounding those tasks.

**COURSE CONTENT**

• Introduction to Studio and Studio Manager

• Studio Manager setup

• Administration of repositories, managed projects, users, and roles

• Administration of data environments and indexes

• Overview of Studio WorldMap

• Administration of quality tags and coordinate reference systems

• Data transfers between Petrel and Studio

• Data loading in Petrel

**ProSource Petrel and Results Fundamentals**

**Foundation – 2 Days**

This 2-day course covers the fundamental concepts and workflows of the ProSource® E&P data management and delivery system and ProSource Petrel software. Participants will learn to use the ProSource results and ProSource Petrel software to capture interpretation results as well as supporting information such as documents and reports at identified project milestones, from interpretation project applications such as Petrel E&P software platform, GeoFrame® reservoir characterization software, and OpenWorks. The course will cover full project file archiving, restoring archives for collaboration, sharing, and reusing. Additionally, project data snapshot publishing workflows specific to the Petrel platform are covered to enable cross-project Petrel data management for reporting on data usage, data completeness, and data duplication.

**COURSE CONTENT**

• Basic concepts of ProSource Results

• Study and 3D model containers, data capturing, data restoration

• Capturing and restoring interpretation results from/to GeoFrame

• Matching rules management

• Identification of data transfer issues and data correction

• Overview of database management tasks for Studio Database installation

**AUDIENCE**

Data managers or data administrators and, Petrel users with data management responsibilities

**PREREQUISITE**

Petrel Fundamentals course, or be familiar with Petrel, Basic proficiency in a Windows operating system including knowledge about managing Windows services; understanding user accounts and working in a domain; and creating, organizing, and sharing folders
• Attaching documents and reports to study containers
• Archiving file-based project files and unstructured data
• Basic concepts of ProSource Petrel extension
• Configuring the ProSource Petrel plug-in
• Publishing Petrel project data snapshots - interactive and scheduled
• Accessing the ProSource Petrel index for multi-project data viewing, comparing, reporting
• Archiving and restoring complete Petrel projects
• Capturing and restoring interpretation results from/to Petrel

AUDIENCE
Petrotechnical data administrators, data loaders, data managers, and geoscientists with a need to understand the functionalities and workflows supported by ProSource Results

PREREQUISITE
ProSource Framework Fundamentals course or working knowledge of ProSource and Petrel software.

eSearch Fundamentals
Foundation – 1 Day

This course teaches the attendees how to use eSearch Asset Management software for browsing and ordering covering both physical and digital assets. Attendees are introduced to the system architecture, components, data model organizational structure, and the graphic user interface and tools available in eSearch. Attendees are also guided through the different techniques to find cataloged assets, including generation of reports, ordering and borrowing assets.

COURSE CONTENT
• Interfaces
• Ordering
• Central management of local assets
• Barcode scans
• Bulk edits
• Browsing of documents and attachments
• Custody activity reports

AUDIENCE
Data and information management professionals, data loaders, data managers, database and IT administrators, and petrotechnical staff.

PREREQUISITE
None

Studio for Petrel Users
Skill – 1 Days

This 1-day course is designed for users who are already familiar with Petrel platform, but who need to learn about Studio from a user’s perspective. The purpose of this course is to describe basic concepts used in Studio (such as repositories and indexes) and learn how to work in a Studio environment. The training focuses on tools in Petrel platform that interact with Studio. This course covers topics such as setting up a database connection and synchronizing data between a Petrel project and a Studio repository.

COURSE CONTENT
• Module 1: Overview and basic concepts
• Module 2: Petrel platform and the Studio Database
• Module 3: Data transfers
• Module 4: Finding your data
• Module 5: Collaborating with your team
• Module 6: Manage your data

AUDIENCE
Geophysicists, geologists, geochemists, and technical personnel familiar working in Petrel platform, but no experience in Studio

PREREQUISITE
Petrel Fundamentals

Introduction to Information Management in the Petroleum Industry
Foundation – 3 Day

This 3-day course covers fundamental concepts such as standard data types, data life cycle, quality, and security, enabling participants to understand information management in different contexts such as the corporate, project and operational environments, their organizations, and associated data management processes.

Participants will learn about data governance principles and their applications in the E&P business.

Class lectures and practical activities are used to help participants realize the business value of data management and its impact through the oilfield Life cycle.

COURSE CONTENT
• Module 1: Principles
  - Business value
  - Data
  - Information
  - Knowledge
  - Wisdom
• Module 2: Data
  - Oilfield life cycle
  - Data types and categories
  - Structured and Unstructured
  - Data life cycle
  - Quality
  - Security
• Module 3: Information
  - Project versus corporate versus operational
  - Context and organization
  - Process
• Module 4: Governance
  - Organization and definitions
  - Policies and procedures
  - Standards
  - Methodologies
  - Ownership
  - Risks and mitigations
  - Decisions
  - Legal obligations
Module 5: Operations
- Architecture
- Development
- Infrastructure
- Service Management

**AUDIENCE**
Petroleum data management professionals related functions, individuals with domain experience, technical data management from other industries (aerospace, defense, medical, finance), and corporate executives with budgeting responsibilities in E&P data handling

**PREREQUISITE**
General understanding of the E&P business and/or awareness of technical data handling.

**InnerLogix DQM Solution Workshop**

**Awareness – 1 Day**

The DQM Solution Workshop provides an opportunity to learn about the relevance and impact of Data Quality Management in the petroleum industry and how DQM can be implemented within your organization to generate a positive impact on productivity. During this workshop, you will have the opportunity to learn about InnerLogix, a specialized software technology designed for petroleum industry E&P data. This is a strategic and necessary tool for supporting the DQM implementation process. You will see InnerLogix DQM in action by working through a variety of demonstration scenarios. The training illustrates automated and manual data quality control processes in the context of relevant petroleum industry data management challenges.

**COURSE CONTENT**
- DQM methodology overview
- InnerLogix tools and technology overview
- Practical approach to DQM implementation situations
- Sources of reference material and DQM pilot information

**AUDIENCE**
Corporate managers, data management professionals, DBA, IT professionals, and domain experts: Geo-Technicians, Geoscientists, Reservoir Engineers, etc.

**PREREQUISITE**
Understanding of the E&P petroleum industry and its information management challenges
Electrical Technician Operations and Maintenance

NEOt’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked , while technical courses that use software have been marked , and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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### Cathodic Protection

**Skill – 2 Days**

This 2-day course is designed to provide participants with an understanding of the basic principles of corrosion mechanisms. It focuses on the control of galvanic corrosion by the use of sacrificial anodes and induced current cathodic protection. Participants will learn the main components used in cathodic protection and methods used to safely test and maintain them. Upon completion of this course, participants will better understand the technology related to cathodic protection within the industry.

**COURSE CONTENT**
- Principles of cathodic protection
  - Chemistry of corrosion
  - Galvanic corrosion
  - Corrosion control
  - Impressed current cathodic protection
- Testing and maintaining cathodic protection systems
  - CP rectifiers
  - Power supplies for remote locations
  - Cables and bonding to structures
  - Testing cathodic protection systems

**AUDIENCE**
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant

**PREREQUISITE**
Familiarity with electrical installations in an industrial setting

### Power Generation Systems and Equipment

**Skill – 2 Days**

This 2-day course is designed to provide participants with an understanding of the information required for the proper construction, operation, and maintenance of generators used as the prime source of power in remote locations and diesel generators that are used for both prime and essential power supply. Participants will also be introduced to the operation and maintenance of alternators and the basics of gas turbine and diesel engines. Upon completion of the course, participants will better understand the technology related to power generation within the industry.

**COURSE CONTENT**
- Construction and operation of AC generators
  - Construction
  - Operation
  - Control
  - Synchronization
- Prime movers: diesel and gas Turbine engines
  - Basic operation
  - Auxiliary equipment
  - Starting procedure
  - Generator maintenance

**AUDIENCE**
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities in an industrial plant

**PREREQUISITE**
Familiarity with electrical installations in an industrial setting

### Electrical Pumps, Motors, and MCC

**Skill – 3 Days**

This 3-day course will provide participants with knowledge for the construction and operation of induction, synchronous, and DC motors to identify the different problems associated with electrical drivers. Participants will learn the basic maintenance and troubleshooting of induction motors and the types of electric motor-driven pumps available and the criteria used in the selection of electric motors to drive them. will be better equipped to identify, repair, and maintain these systems, as well as increase the knowledge within the maintenance team.

**COURSE CONTENT**
- Electric motors
  - Construction
  - Operations and maintenance
  - Characteristics of induction motors
  - Types of DC motors and their operating characteristics
  - Speed control of DC motors
- Electric motor-driven pumps
  - Operating characteristics of pumps
  - Matching pumps to motors
  - Pump controls
  - Variable speed drives
- Motor control centers
  - Specifications
  - Installation
  - Maintenance
  - Safety features

**AUDIENCE**
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant

**PREREQUISITE**
Familiarity with electrical installations in an industrial setting

### Lighting and Small Power

**Skill – 2 Days**

This 2-day course is designed to provide participants with basic understanding of the operation and installation of luminaires with bulbs of different technologies, including LED lamps. The course also covers emergency lighting, single-phase motors, electric heat tracing, power sockets, air conditioners, photo voltaic (PV) power sources, and thermal electric generators (TEGs). Upon completion of this course, participants will have a basic understanding of lighting and small power systems within the oil and gas industry.

**COURSE CONTENT**
- Luminaires and single-phase motors
  - Luminaires
  - Emergency lighting
COURSE OFFERINGS

- Lighting in hazardous areas
  - Heat tracing and remote power systems
    - Electric heat tracing
    - Power outlets
    - AC systems
    - PV systems
    - TEG systems
- Single-phase motors
- Field trips

AUDIENCE
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant

PREREQUISITE
Familiarity with electrical installations in an industrial setting

**Low-Voltage Distribution Systems and Equipment**

**Skill – 3 Days**

This 3-day course is designed to provide participants with an understanding of the layout of low voltage (<1,000 V) distribution systems found in a typical industrial plant. Topics covered include basic distribution system designs, typical equipment used and basic maintenance of the equipment, and safety issues associated with low-voltage distribution systems. Upon completion of this course, participants will better understand low-voltage distribution system technology within the oil and gas industry. Having this knowledge will help each technician develop confidence and professional enthusiasm, therefore, increasing their efficiency. The knowledge that technicians gained from this course will be further expanded by on-job training and practical experience they will receive throughout the duration of their career.

**COURSE CONTENT**

- Basics of low-voltage (LV) distribution systems
  - Single-line diagrams
  - Layout of various distribution systems
  - Stress due to short circuits
  - System grounding
- Power distribution equipment
  - Metal clad switchgear
  - Circuit breakers
  - Automatic transfer switches
  - Transformers
- Power distribution safety and maintenance
  - LV fuses and cables
  - Safety grounding
  - Arc flash safety
  - Distribution system maintenance

**Audience**
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant

**Prerequisite**
Familiarity with electrical installations in an industrial setting

**Electrical - Fault Finding and Troubleshooting**

**Skill – 2 Days**

This 2-day course is designed to provide participants with basic troubleshooting techniques. It covers an analytical method for troubleshooting electrical power distribution systems, electrical control systems, electrical motors, transformers, and switchgear. Participants will be given real-world scenarios as classroom exercises to reinforce theory. Upon completion of this course, participants will have a basic understanding of troubleshooting techniques within the oil and gas industry.

**Course Content**

- Basic troubleshooting skills
  - Safety in troubleshooting
  - Electrical drawings
  - Use of testers
  - Analytical troubleshooting
- Troubleshooting electrical equipment
  - Troubleshooting power distribution
  - Troubleshooting motors
  - Troubleshooting VFD
  - Troubleshooting lighting systems

**Audience**
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities in an industrial plant

**Prerequisite**
Familiarity with electrical installations in an industrial setting

**Hazardous Areas Classification and Installation**

**Skill – 5 Days**

This 5-day course is designed to provide the participant with an understanding of the characteristics of flammable materials, classification of hazardous locations, types of equipment used in hazardous locations, typical wiring systems, and inspection and maintenance guidelines.

Hazardous areas exist in many industrial and commercial facilities where process information is gathered using sensors, switches, and manually operated controls. Hazardous conditions can exist during normal daily operations as a result of the release of flammable materials into the atmosphere. Releases can occur due to leaks at valves and pipe flanges, from routine maintenance where a seal is being replaced, or where a process results in the regular escape of gases and vapors. In many jurisdictions, either government or company mandated training is required for personnel working in these environments. There are many occupations and workers employed in this sector of industry that are affected by the safety requirements for working in hazardous locations. Upon completion of this course participants will better understand the hazardous conditions associated with working in industrial and commercial oil and gas production facilities.

**Course Content**

- Nature and grouping of flammable gases
  - Sources of ignition
  - Flashpoint
  - Ignition temperature
- Hazardous area classification
  - Hazardous location classification (NEC)
  - Hazardous location classification (IEC)
Electrical Transformers

Skill – 3 Days

Provide the necessary knowledge to demonstrate the principles for the operations and maintenance (O&M) of power transformers typically found in oil and gas industry. It is designed to provide participants with an understanding of the information that is required for the proper construction, operation, and maintenance of power transformers. Upon completion of this course, participants will better understand the technology related to power transformers within the industry. This course has been designed to provide participants with an understanding of the information that is required for the proper construction, operation, and maintenance of power transformers.

COURSE CONTENT

- Transformer basics
  - Transformer principles
  - Types of transformers
  - Tap changers
  - Instrument transformers
- Transformer installation and operation
  - Specifications
  - Installation
  - Commissioning tests
- Maintenance and transformer asset management
  - Transformer failure modes
  - Routine maintenance
  - Life expectancy assessments

AUDIENCE

Electrical technicians, maintenance planners, supervisors with operation and maintenance responsibilities, and others who work in an industrial plant setting.

PREREQUISITE

Familiarity with electrical and instrumentation installations in an industrial setting.

Electrical Authorization

Skill – 2 Days

This 2-day course is designed to provide participants with an understanding of the safety structure and protocols required when working in an electrical environment. The emphasis is on the need for ensuring constant and continuous adherence to these processes and the safety of all personnel working within the operating area.

Upon completion of this course, participants will better understand the criticality and purpose of the policies and procedures associated with electrical systems and equipment.

COURSE CONTENT

- Internal process and controls
  - Electrical policies and procedures
  - Workplace communication and notices
  - Workplace audits
- Electrical awareness and safety
  - Electrical safety documents
  - Electrical safety rules
  - Electrical areas

AUDIENCE

Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities in an industrial plant.

PREREQUISITE

Familiarity with electrical installations in an industrial setting.

Power Quality and Management

Skill – 2 Days

A portion of this 2-day course is designed to provide participants with an understanding of these issues that affect power quality in an industrial plant, its effects on the operation of electrical equipment, and remediation techniques used to lessen their impact. Another portion is designed to familiarize participants with the typical parameters that are monitored and controlled by power management systems, including the hardware, communication, and software available for power management systems.

Upon completion of this course, participants will better understand the technology related to power quality and power management within the industry.

COURSE CONTENT

- Power quality management
  - Sources of poor power quality
  - Standards for power quality
  - Measuring power quality
  - Methods for improving power quality
- Power management systems
  - Typical power management system layout
  - Load control
  - Active and re-active power control
  - Integration with protection scheme

AUDIENCE

Electrical technicians, maintenance planners, supervisors with operation and maintenance responsibilities, and others who work in an industrial plant setting.

PREREQUISITE

Familiarity with electrical installations in an industrial setting.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
AUDIENCE
Electrical technicians, maintenance planners, supervisors with operation and maintenance responsibilities, and others who work in an industrial plant setting.

PREREQUISITE
Familiarity with electrical installations in an industrial setting.

Earthing Systems (Electrical Grounding Systems)
Skill – 2 Days

This 2-day course covers the principles of grounding and how grounding systems operate to give participants an understanding of how these systems are installed, tested, and maintained.

Upon completion of this course, attendees will better understand the principles related to grounding systems within the oil and gas industry.

COURSE CONTENT
- Basic grounding
  - Safety grounding
  - System grounding
  - Lightning protection
  - Ground electrodes
- Grounding installations
  - Offshore grounding
  - Ground loops
  - Static protection
  - Testing grounding systems

AUDIENCE
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities in an industrial plant.

PREREQUISITE
Familiarity with electrical installations in an industrial setting.

Uninterruptable Power Supplies (UPS) and Battery Banks
Skill – 2 Days

This 2-day course covers information that is required for the proper construction and operation as well as maintenance of UPS and battery banks and principles of maintenance associated with emergency shutdowns and safety systems. Upon completion of this course, participants will better understand the technology related to UPS and battery banks within the industry.

COURSE CONTENT
- Uninterruptable power supplies
  - UPS topologies and application
  - Components in alternating power (AC) UPS
  - Components in direct current (DC) UPS
  - Application for DC UPS
- Battery banks
  - Basic secondary cell
  - Charging and discharge characteristics
  - Battery safety
- Maintenance of UPS

AUDIENCE
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant.

PREREQUISITE
Familiarity with electrical installations in an industrial setting.

Electrical Protection Systems and Equipment
Skill – 2 Days

This 2-day course is designed to provide participants with an understanding of basics of electrical protection system. It covers the operational characteristics of typical protection devices used in an industrial electrical system and introduces protection systems for major electrical equipment such as generators, transformers, switchgears, and motors. Upon completion of this course, participants will better understand technology related to electrical protection systems within the oil and gas industry.

COURSE CONTENT
- Electrical Protection Basics - Introduction
  - Protection goals
  - System faults
  - Protection relays
  - Measurement transformers
- Electrical Protection Basics - Protection Schemes
  - Equipment protection
  - Intertipping schemes
  - Routine inspection and testing

AUDIENCE
Electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant.

PREREQUISITE
Familiarity with electrical installations in an industrial setting.

Introduction to Oil Field Surface Facilities Operations with Simulator
Foundation – 5 Days

This 5-day course introduces the basic types of equipment and mechanical systems used in oil and gas production facilities. The objective is for participants to develop an understanding of the function and control of key equipment. The course includes a substantial simulation component to enhance understanding of production system operation and performance.

COURSE CONTENT
- Introduction to basic equipment and systems for oil and gas production
  - Overview of oil and gas production systems
  - Pumps
  - Tank systems
  - Troubleshooting Pump and Tank Systems
- Compressor Operation
  - Reciprocating compressors
  - Centrifugal compressors
- Troubleshooting compressor operation
  • Instrumentation and system control
  - Introduction to instrumentation
  - Troubleshooting instrumentation
  - Process control
  - Well system control
  - Diagnosing control issues
  • Well System Operation
  - Introduction to Production Operations
  - Monitoring Well Operation
  - Alarms and Interlocks
  - Abnormal Situation Management
  • Well System Operation (Cont.)
  - Optimizing Well Production
  - Troubleshooting Production Issues
  - Environmental System Operation

AUDIENCE
Entry-level operation engineers and technician

PREREQUISITE
None. Familiarity with basic mechanical equipment used in energy production is helpful.
Instrumentation Technician Operations and Maintenance

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked , and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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| SKILL | | |
|-------| | |
| Supervisory Control and Data Acquisition (SCADA) System | Programmable Logic Controller (PLC) | Instrument Fieldbus Control |

| FOUNDATION | |
|------------| |
| Introduction to Oil Field Surface Facilities Operations with Simulator | |

Software: Technical courses that use software
Includes practical sessions
Field trips
Uses simulation
Process Measurement

Skill – 3 Days

To safely and effectively operate an oil and gas processing plant, the process operator must have an accurate measurement of all the process variables related to making a quality product. The four essential measuring parameters are flow, temperature, pressure, and level. Other types of measuring parameters such as vibration and onstream analysis are also available. Due to the multitude of process applications, no one meter can be used to cover all situations. Therefore, many types of measuring instruments must be made available.

In this 3-day course, participants will learn about the basic elements of process measurement, the operating principles of measurement sensors, and how measurement signals are transmitted. They will gain an understanding of the four common measuring parameters as well as some of the less common parameters used in industry.

COURSE CONTENT

• Process measurement overview
  - Introductory information
  - Process measurement
  - Meter calibration
  - Measurement sensors
  - Signal transmission

• Process measurement: flow and temperature
  - Flow measurement
  - Temperature measurement

• Process Measurement: pressure
  - Pressure measurement
  - Level measurement
  - Other measuring devices

AUDIENCE

Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians

PREREQUISITE

Some exposure to oil and gas facility terminology

Communication Systems

Skill – 2 Days

Communication systems, whether for everyday operations or in an emergency situation, are typically governed by federal and state legislation and controlled by rigid guidelines within the region where they are set up. They are dependent on radio transmission and reception, and equipment can be hard wired, use radio waves, or communicate via satellite.

This 2-day course was designed to introduce participants to the different types of communication equipment and the operation of a transmitter and a receiver. The course covers radio frequency bands, the different media used to communicate information, and the legislative regulations involved in telecommunications. Participants will be exposed to the specific communication protocols that are used as well as some of the common communication equipment used in everyday plant operations.

Upon completion of this course, participants will better understand the operation and importance of communications systems associated with oil and gas environments.

COURSE CONTENT

• Telecommunication equipment and regulation
  - Types of communication systems

Safety Instrumented Systems (SIS)

Skill – 4 Days

The SIS is designed to respond to plant emergency situations and generate the correct output before a hazardous event takes place. It requires planning and is designed specifically for the characteristics of each facility to integrate plant shutdown systems such as the emergency shutdown devices (ESDs) and plant shutdown devices (PSDs). Once the SIS requirements are determined, the appropriate technology is chosen, and the SIS is installed and tested for functionality and operability. It must be maintained and checked at regular intervals.

This 4-day course will introduce participants to the design considerations and relevant information needed to properly select an SIS and to understand the process involved in choosing the technology that best fits to the plant as well as installation, testing, and managing the SIS.

COURSE CONTENT

• Safety Instrumented Systems
  - Introduction
  - Design considerations
  - Protection layers
  - Safety integrity levels

• SIS Technology
  - Choosing a technology
  - SIS evaluation
  - Hardware
  - Control and safety systems integration

• ESD and PSD systems
  - Introduction
  - Permissives and interlocks
  - Alarm systems
  - Redundancy
  - Testing, resetting, and bypassing

• SIS Testing and Installation
  - Installing the SIS
  - Initial testing
  - Functional testing

PREREQUISITE

Some exposure to oil and gas facility terminology
**Hazardous Areas Classification and Installation**

**Skill – 5 Days**

This 5-day course is designed to provide the participant with an understanding of the characteristics of flammable materials, classification of hazardous locations, types of equipment used in hazardous locations, typical wiring systems, and inspection and maintenance guidelines.

Hazardous areas exist in many industrial and commercial facilities where process information is gathered using sensors, switches, and manually operated controls. Hazardous conditions can exist during normal daily operations as a result of the release of flammable materials into the atmosphere. Releases can occur due to leaks at valves and pipe flanges, from routine maintenance where a seal is being replaced, or where a process results in the regular escape of gases and vapors. In many jurisdictions, either government or company mandated training is required for personnel working in these environments. There are many occupations and workers employed in this sector of industry that are affected by the safety requirements for working in hazardous locations. Upon completion of this course participants will better understand the hazardous conditions associated with working in industrial and commercial oil and gas production facilities.

**COURSE CONTENT**

- Nature and grouping of flammable gases
  - Sources of ignition
  - Flashpoint
  - Ignition temperature
- Hazardous area classification
  - Hazardous location classification (NEC)
  - Hazardous location classification (IEC)
  - Grouping of gases
  - Temperature classifications
- Electrical enclosure protection methods and marking
  - Equipment identification
  - Apparatus label marking
  - Flameproof enclosures
- Wiring systems for hazardous areas
  - Types of cables suitable for hazardous areas
  - Types of cable glands
  - Wiring methods for flameproof equipment
  - Wiring methods for intrinsically safe equipment
- Inspection and maintenance
  - Inspection and maintenance of flameproof installations
  - Inspection and maintenance of IS installations

**AUDIENCE**

Electrical and instrumentation technicians working in the field as an introduction, individuals working with equipment purchasing, procurement, storage, and job planning, and immediate supervisors to the working technicians

**PREREQUISITE**

Familiarity with electrical and instrumentation installations in an industrial setting.

**Subsea Control Systems**

**Skill – 3 Days**

Subsea E&P operations require specially designed equipment and components to withstand the harsh environment. This 3-day course covers the components of the subsea wellhead control system and system maintenance and control requirements. While focusing on the technical aspects of measurement and control of subsea wellhead control systems, this course provides a balance of theory, demonstrations, and case studies to support the operational, maintenance, and safety concepts related to this important system. Attendees not directly involved with subsea wellhead control systems will become familiar with the parts of the system and some of the challenges involved in the installation, repair, and maintenance.

**COURSE CONTENT**

- Subsea wellhead system
  - Equipment
  - Safety and operating procedures
  - Flanging of the wellhead
- Subsea wellhead control equipment
  - Valves and valve actuators
  - Sensors and transmitters
  - Cabling
- Subsea wellhead control
  - Flow and hydraulic controls
  - Safety shutdown systems

**AUDIENCE**

Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel

**PREREQUISITE**

Some exposure to oil and gas facility terminology.

**Process Control**

**Skill – 5 Days**

This 5-day course covers the nature of process control and the parts of the control loop. Participants will learn about the types of control signals used, the types of controllers and their functions, and how the control loop is used in process control. With basic knowledge of process control, participants will have exposure to more advanced types of control systems. Process control involves the gathering of process signals, comparing these signals to a desired setpoint for optimization of the process, and activating final control elements. The signals to and from the controller must be to an industrial standard and meet the hazardous area requirements. Controllers are manufactured to be versatile enough to meet the requirements of any process dynamic. They can be set up in different control modes to meet the needs of more advanced control schemes used in industry.

**COURSE CONTENT**

- Process control
  - Introductory information
  - Nature of process control
  - Final control element
  - Process control loop
- Process control signals
  - Discrete control signals used by process controllers
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Error signals used by process controllers
- Definition of control output
- Definition of signals to and from transmitters and controllers

• Process controllers
  - Principles used in process control
  - Types of controllers
  - Types of controller modes

• Fundamentals of control loops
  - In process control
  - Elements of control loops in process control
  - Types of process control
  - Loop dynamics in process control
  - Elements of loop protection in process control

• Advanced control
  - Cascade control
  - Feed-forward control
  - Ratio control
  - Multivariable/robotic control

AUDIENCE
Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians

PREREQUISITE
Some exposure to oil and gas facility terminology.

Information Security for Industrial Systems

Skill – 3 Days

This 3-day course is designed to provide an awareness of security risks and effective management issues for the products those in the oil and gas industry today produce, store, and transport. The petroleum industry can be subject to multiple threats, and they face serious and growing risks from cyberattacks, malicious software, and other threats against their IT infrastructure and intellectual property

COURSE CONTENT
• Critical Infrastructures
  - Sector vulnerabilities and security risks
  - Fundamentals of upstream security
  - Elements of a secure oil and gas infrastructure

• Security solutions
  - Secure operating systems
  - Data and network access protection
  - Security audits

• Security risk management
  - Oil and gas safety management issues
  - Best practices in security management
  - Training and awareness

AUDIENCE
All employees working in the oil and gas industry

PREREQUISITE
Some exposure to an oil and gas facility terminology

Fire and Gas System

Skill – 2 Days

This 2-day course covers an introduction to the fire and gas system, including associated hardware and wiring. The course will explore the required software logic that must be programmed into the system to meet the needs of the plant’s shutdown philosophy. The fire and gas system’s preventative action protocol will also be discussed. Upon completion of the course, participants will better understand the operations, maintenance, and testing associated with a fire and gas system. This exposure will better prepare technicians to further expand their knowledge base during on-the-job training and practical experience at the plant site.

COURSE CONTENT
• Fire and gas hardware
  - Introduction
  - Detectors
  - Wiring and documentation
  - Control system logic
  - Display, indication systems, and final control elements

• Fire and gas operation
  - Testing and maintenance
  - Confirmed fire and gas
  - Combined safety system (CSS)
  - Shutdown philosophy
  - Cause and effect and process and instrumentation diagrams

AUDIENCE
Process operators, process technicians, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; and immediate supervisors to the working technicians

PREREQUISITE
Some recent exposure to fire and gas terminology in the oil and gas industry

Control System Cabling

Skill – 2 Days

This 2-day course is designed to cover the basic characteristics of wiring and cabling used in the instrumentation and control industry. Participants will learn about construction, electrical characteristics, and available accessories as well as common installation and testing techniques to better understand instrumentation and control cabling and wiring standards used in the instrumentation field. The information gained from this course will be used to enhance and expand a technician’s knowledge base through on-the-job training and practical experience at the plant site, enabling technicians to become familiar with the wiring and cabling standards as well as proper procedures specified by the manufacturer when connecting simple and complex instrumentation and control system components.

COURSE CONTENT
• Cable characteristics
  - Conductors, insulators, and jacket materials
  - Shields and armor
  - Cable selection criteria
  - Electrical characteristics
  - Cable Installation, testing and accessories

AUDIENCE
All employees working in the oil and gas industry

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Cable specifications and industry standards
  - Control and instrumentation cable standards
  - General wiring practices
  - Hazardous area wiring practices
  - Instrumentation and control system wiring

AUDIENCE
Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

PREREQUISITE
Some exposure to oil and gas facility terminology

### Hydraulic Control Panel

**Skill – 3 Days**

Oil and gas plants control wells through wellhead control panel (WHCPs), and each well is equipped with a surface-controlled subsurface safety valve (SCSSV) or a downhole valve (DHV) and surface safety valve (SSV) that consist of a master valve (MV) and wing valve (WW). WHCP systems usually consist of a hydraulic reservoir, strainer, hydraulic pumps, accumulator, wellhead control module, and hydraulic lines. Any other parts, except wellhead control module, are housed in a basic cabinet. Each control module is dedicated for one well only.

This 2-day course provides the necessary information for participants to become familiar with the principles of oil well hydraulic control panels. Routine, emergency operation, and associated features will be examined while stressing process, safety, and environmental compliance and concerns. Case studies will be used to reinforce the material covered.

**COURSE CONTENT**

• Wellhead valves
  - Types, construction, and operation
  - Hydraulic panel connections to the wellhead
  - Single and multiple wellhead panels

• Wellhead panel hydraulic systems
  - Supply systems and components
  - Wellhead control instrumentation
  - Hydraulic control system

• Hydraulic wellhead control panel
  - Hydraulic switches, valves, and pressure monitoring
  - Disassembly and assembly of a hydraulic unit
  - Operation, maintenance, and testing of a hydraulic unit

**AUDIENCE**
Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

**PREREQUISITE**
Some exposure to oil and gas facility terminology

### Process Analyzers

**Skill – 3 Days**

With the advancement in computer applications and electronics, analyzers have taken the spot sampling capability of a laboratory and converted into a continuous sampling system. With continuous sampling, the process variable is analyzed on a continuous basis with a faster update time. Faster update time has given the analyzer the ability to be used for control purposes.

**COURSE CONTENT**

• Analyzer selection
  - Introduction to analyzer systems
  - Selecting analyzer systems
  - Analyzers sensors

• Sample conditioning systems
  - Analyzer sampling systems
  - Components of an analyzer sampling system
  - Physical limitations of a sampling system
  - Characteristics of analyzer sampling systems

• Types of analyzers
  - Conductivity and pH
  - Optical analyzers
  - Combustion analyzers
  - Gas chromatography

**AUDIENCE**
Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

**PREREQUISITE**
Some exposure to oil and gas facility terminology

### Instrument Calibration and Verification

**Skill – 2 Days**

This 2-day course is designed to introduce the basic principles of verification and calibration. Attendees will learn about the responsibilities of the instrument technician and the importance of accuracy and documentation. The course covers the various calibration procedures of various types of measuring instruments as well as the more complex final control elements and onstream analyzers. Upon completion of the course, attendees will better understand the technology and methods associated with verification and calibration and the purpose and importance of the operations cycle.

**COURSE CONTENT**

• Calibration and verification
  - Principles
  - Responsibilities
  - Documentation
  - Procedures

• Calibrating instruments
  - Temperature and pressure devices
  - Level and flow devices
  - Final control elements
  - Analyzers

**AUDIENCE**
Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

Some exposure to oil and gas facility terminology
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

planners, and immediate supervisors

PREREQUISITE

Some exposure to an oil and gas facility terminology

Final Control Elements

Skill – 3 Days

This 3-day course introduces final control elements—devices driven by a controller that change the operating conditions of the process—and their requirements. Participants will learn about the different types of final control elements, how they are constructed, and their common and unique characteristics. There will be discussions about the various accessories available to enhance the operation of the final control element and about the environmental aspects of final control elements.

Upon completion of this course, participants better understand the many types and varieties of final control elements.

COURSE CONTENTS

- Introduction to final control elements
  - Overview
  - The control loop
  - Pneumatic, electric, and hydraulic principles
- Components of final control elements
- Kinds of final control elements
- Characteristics of final control elements
- Final control element accessories, valve characteristics, and rangeability
  - Function of positioners in final control elements
  - Control signals for final control elements
  - Accessories available on final control elements
  - Valve process characteristics and rangeability
  - Noise control

AUDIENCE

Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

PREREQUISITE

Some exposure to an oil and gas facility terminology

Fiscal Metering

Skill – 3 Days

This 3-day course is designed to enhance understanding of principles of fiscal metering as it relates to instrumentation. It covers various fluid flow measuring devices and associated equipment found in a typical fiscal metering station. Operational characteristics and maintenance requirements for these instruments are also covered. Upon completion of this course, participants will better understand the operation of a typical fiscal metering station.

COURSE CONTENT

- Basic fiscal metering
  - Flow measurement
  - Standards for fiscal metering
  - Flow measurement instruments
  - Gas chromatographs
- Fiscal metering instrumentation
  - Flow meters

AUDIENCE

Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

PREREQUISITE

Some exposure to an oil and gas facility terminology

Distributed Control Systems (DCS)

Skill – 4 Days

With the development of DCS, organizing all information in a hierarchical system is made easy. DCS displays information on a computer and allows process operators to run the process, making the process information available to other people in the plant. Once the DCS converts the process information to personal computer language, it can be distributed to everyone on the plant site and to other parts of the organization anywhere in the world. This 4-day course covers the main characteristics of the DCS systems to familiarize participants with the DCS hardware and how it is connected together to make up the basis of the DCS. Once the hardware is installed and tested, participants will learn about programming the DCS software, and after the software is configured, they will become familiar with the DCS accessories such as alarm and data reporting systems.

COURSE CONTENT

- DCS
  - Introduction
  - Basic concepts
  - Specifications and selection criteria
  - Control system and security hierarchy
  - Implementation
- DCS hardware
  - Block diagram
  - Hardware
  - Communication
  - Hardware security and redundancy
- DCS software
  - Control system configuration
  - Controller configuration
  - Function block configuration
- DCS accessories
  - Alarm system management
  - Reporting
  - Diagnostics
- Typical DCS Systems

AUDIENCE

Instrumentation technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors

**PREREQUISITE**
Some exposure to an oil and gas facility terminology

### Supervisory Control and Data Acquisition (SCADA) System

**Skill – 2 Days**

The SCADA system allows control of plants in isolated areas where it is not practical to run physical wiring, reducing the need for an operator in isolated areas for long periods of time. The heart of the SCADA system is its ability to gather information and provide two-way communication over long distances through wireless technology to a central control room. This 2-day course covers the benefits of SCADA systems and how they impact real-time control remotely, the SCADA system’s hardware—sensors, actuators, wiring, and interfaces—used to monitor the process and its economic benefits.

Upon completion of the course, participants will be aware of topics such as real-time control, hardwired and wireless communication methods used in the SCADA system, and the limitations of the SCADA systems. This course will allow each technician, with further on-job training and experience, to be able to attend more advanced training.

**COURSE CONTENT**
- SCADA overview
  - Introduction
  - Master and remote terminals
  - Sensors, actuators, and wiring
  - Operator interface
  - SCADA economics
- SCADA communications
  - Real-time systems
  - Communication system components
  - Radio and satellite communication
  - Limitations of SCADA

**AUDIENCE**
Process technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians

**PREREQUISITE**
Some exposure to oil and gas facility terminology

### Programmable Logic Controller (PLC)

**Skill – 3 Days**

The PLC, a specialized computer used for the overall control and operations of processes, uses a programmable memory to store instructions and execute specific functions that include on/off control, timing, counting, sequencing, arithmetic, and data handling. Designed to operate in an industrial environment, its original purpose was to replace hardwired relays. With the development of modern electronics, the PLC has increased in reliability and flexibility to become a workhorse in the oil and gas industry.

In this 3-day course, participants will learn about PLC hardware and how each piece of the PLC contributes to its overall operation and reliability. Discussions will cover the different numbering systems that form the basis of digital control logic as well as the various types of programming and options available in building a control program. The course will close with coverage of how to properly install, maintain, and troubleshoot the PLC. Safety is included and will be stressed throughout this course.

**COURSE CONTENT**
- PLC hardware and numbering systems
  - Overview
  - Hardware components
  - Numbering systems
  - Fundamentals of logic
- PLC programming
  - Basics of programming
  - Ladder logic programs
  - Gate logic
  - Timers and counters
  - Sequencers and shift registers
- PLC installation and troubleshooting
  - Enclosures
  - Grounding
  - Voltage supplies
  - Program editing
  - Preventative maintenance/troubleshooting

**AUDIENCE**
Process technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians

**PREREQUISITE**
Some exposure to oil and gas facility terminology

### Instrument Fieldbus Control

**Skill – 2 Days**

This 2-day course will cover the development of the foundation fieldbus system, as well as the improvements it offers relative to distributed control, availability, and reliability. Discussions will revolve around the operation, maintenance, and troubleshooting of the foundation fieldbus, as well as issues around integration and migration. Finally, topics such as installation, commissioning, and communication networks, as well as safety features, will be introduced.

**COURSE CONTENT**
- Fieldbus installation and communication
  - Integration and migration
  - Installation and commissioning
  - Digital communication networks
  - Communication topologies
  - Availability and safety

**AUDIENCE**
Process technicians working in the field, technicians working in other disciplines, equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians
equipment purchasers, procurement and storage personnel, job planners, and immediate supervisors to the working technicians

**PREREQUISITE**
Some exposure to oil and gas facility terminology

**Introduction to Oil Field Surface Facilities Operations with Simulator**

**Foundation – 5 Days**

This 5-day course introduces the basic types of equipment and mechanical systems used in oil and gas production facilities. The objective is for participants to develop an understanding of the function and control of key equipment. The course includes a substantial simulation component to enhance understanding of production system operation and performance.

**COURSE CONTENT**

- Introduction to basic equipment and systems for oil and gas production
  - Overview of oil and gas production systems
  - Pumps
  - Tank systems pump and tank systems
- Compressor Operation
  - Reciprocating compressors
  - Centrifugal compressors
  - Troubleshooting compressor operation
- Instrumentation and system control
  - Introduction to instrumentation
  - Troubleshooting instrumentation
  - Process control
  - Well system control
  - Diagnosing control issues
- Introduction to production operations
  - Monitoring well operation
  - Alarms and interlocks
  - Abnormal situation management
  - Optimizing well production
  - Troubleshooting production issues
  - Environmental system operation
  - Practice on the Simtronics DSS-100 Process Simulator, including SPM-3010 advanced gas-oil separation process, and SPM-3100 Amine Treating Unit

**AUDIENCE**
Entry-level operation engineers and technician

**PREREQUISITE**
None. Familiarity with basic mechanical equipment used in energy production is helpful.
Mechanical Technician Operations and Maintenance

NEtX’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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</table>

Software: Technical courses that use software. Includes practical sessions: Field trips. Uses simulation.
### Heat Exchangers

**Skill – 2 Days**

This course is designed to provide participants with an understanding of the information required for the proper construction, operation, and maintenance of heat exchangers. Inspections and regulations vary depending on the application and current regulations; therefore, technicians must be aware of these when working with heat exchangers. Having this awareness will allow each technician to properly address the different troubleshooting techniques and testing procedures. After completing this course, participants should have a better understanding of the technology related to heat exchangers within the industry.

**COURSE CONTENT**
- Heat exchanger types and operation
  - Primary function of heat exchangers
  - Leakage problems, cause, and identification
  - Safety issues
- Operations and maintenance
  - Diagnostics and troubleshooting
  - Maintenance and repair

**AUDIENCE**
Mechanical technicians in the oil and gas industry; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors of the working technicians

**PREREQUISITE**
Mechanical or technical awareness course

### Positive Displacement Pumps

**Skill – 2 Days**

The purpose of this 2-day course is to develop a working knowledge of the different types of positive displacement pumps, as well as the different procedures associated with operation and installation of such pumps. Technicians are required to have a technical comprehension of pumps, an understanding of the different types and application or type of pump to use. The technicians that participate in this course will be better equipped to repair, maintain, install, and commission pumps and their related systems, while increasing the knowledge within their maintenance team.

**COURSE CONTENT**
- Identification
  - Types of pumps, components, and construction
  - Hazards and safe work practices
  - Tools and equipment
  - Removal and installation procedures
- Maintenance and diagnostics
  - Inspection, troubleshooting, and maintenance procedures
  - Repair or replacement considerations
  - Commission procedures

**AUDIENCE**
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**
Technical or mechanical awareness training

### Turbines (Gas/Steam)

**Skill – 3 Days**

The purpose of this course is to develop a working knowledge of the various types of turbines, as well as the different procedures and regulations associated with the operation and installation of this equipment. After completing this course, participants will be equipped with the knowledge required to commission, install, inspect, troubleshoot, and repair turbines and their related systems.

**COURSE CONTENT**
- Description and application
- Types and operation
- Terminology
- Hazards and safe working practices
- Maintenance and installation
- Components: purpose and operation
- Installation factors
- Turbine installation procedures
- Considerations for repair or replacement
- Tools and equipment for installation, maintenance, troubleshooting, and repair
- Commission procedures

**AUDIENCE**
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**
Awareness training in compressors; dynamic compressor training recommended

### Plant Piping

**Skill – 2 Days**

The purpose of this course is to develop in participants a working knowledge of various types of piping and associated valves, as well as the different procedures and regulations associated with maintenance, installation, and repair of the equipment. After completing this course, participants will be equipped with the basic knowledge required to identify the construction and designs of piping and associated fittings.

**COURSE CONTENT**
- Identification and construction
- Types of piping and tubing systems
- Pipe and tubing sizes
- Ferrous versus nonferrous
- Maintenance and diagnostics
- Natural forces that wear on piping systems

**AUDIENCE**
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**
Mechanical or technical awareness course

Visit [NExTtraining.com/classes](http://NExTtraining.com/classes) for the latest calendar or to register for a course.
### Heating, Ventilation, and Air Conditioning (HVAC) System

**Skill – 3 Days**

The purpose of this course is to develop a working knowledge of the various types of rotating and reciprocating equipment used in HVAC systems, as well as the different procedures and regulations associated with installing and operating this equipment. After completing this course, participants will be equipped with the basic knowledge required to install and repair HVAC equipment and their related systems.

#### COURSE CONTENT
- Identification
- Types of refrigeration compressors and chillers
- Component types
- Characteristics and operating principles
- Installation
- Heat transfer
- Temperature and pressure measuring instruments
- Procedures and principles
- Piping methods and power-off procedures
- Maintenance
- Environmental considerations
- Hazards and safety considerations
- Installation and maintenance procedures
- Troubleshooting

#### AUDIENCE
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

#### PREREQUISITE
Training in compressors and pumps

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### Positive Displacement Compressors

**Skill – 2 Days**

The purpose of this course is for participants to develop a working knowledge of various types of positive displacement compressors. This will include the types of compressors and the different procedures associated with operation and installation. After completing this course, participants will be equipped with the introductory knowledge required to assist in the installation and repair of compressors and their related systems.

#### COURSE CONTENT
- Identification
  - Components
  - Construction
  - Hazards and safe work practices
- Maintenance and diagnostics
  - Repair and troubleshooting procedures
  - Replacement considerations
  - Commission, installation, and maintenance procedures

#### AUDIENCE
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

#### PREREQUISITE
The course in positive displacement pumps is not required, but recommended

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### Pressure Vessels

**Skill – 2 Days**

This 2-day course is designed to provide participants with an understanding of the information required in the construction, operation, and maintenance of pressure vessels. The inspection and regulations will be different depending on application and regional requirements. The technicians must be aware of these. Having this awareness will allow technicians to be more dependable and productive.

#### COURSE CONTENT
- Identification
  - Identification and nomenclature
  - Registration and compliance
  - Regulations and codes
- Inspections and testing
  - Hydrostatic testing
  - Nondestructive testing (external and internal)

#### AUDIENCE
Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

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### Pipeline

**Skill – 5 Days**

This course is designed to provide participants with a basic understanding of maintenance procedures, as well as the related operations, of pipelines and their associated equipment. Attendees will learn maintenance techniques based on the preventive and planned maintenance needed to provide a safe and environmentally protected operation. This will provide participants with an understanding of the technology and its applications at a mechanical technician’s level.

#### COURSE CONTENT
- Gas and petroleum product identification
- Characteristics and properties
- Product state (gas or liquid)
- Terminology
- Concealed piping
- Regulatory guidelines
- Safe practices and procedures
- Pipeline codes and regulations
- Limitation of certain locations
- Installation and maintenance
- Pipe sizing for systems over 2 psi
- Gas venting operations
- Gas phase return, discharge, and suction piping
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Support outlets
- Joint compounds
- Pipe identification

AUDIENCE

Mechanical technicians in the oil and gas industry working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors of the working technicians

PREREQUISITE

Some exposure to an oil and gas facility; exposure to pipe fitting and valves maintenance

Centrifugal Compressors

Skill – 2 Days

The purpose of this course is to develop a working knowledge of the various types of rotating and reciprocating equipment, as well as the different procedures and regulations associated with operation and installation of this equipment. After completing this course, participants will be equipped with the basic knowledge required to commission, install, maintain, and repair nonpositive displacement (dynamic) compressors and their related systems.

COURSE CONTENT

- Identification
  - Types of dynamic compressors
  - Components
  - Construction
- Maintenance and diagnostics
  - Repairing reciprocating compressors
  - Troubleshooting
  - Repairing or replacing

AUDIENCE

Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Some exposure to an oil and gas facility; exposure to pipe fitting and valves maintenance

Centrifugal Pumps

Skill – 5 Days

The purpose of this 5-day course is to develop in participants a working knowledge of the different types of dynamic pumps, which are designed for low-pressure, high-flow systems, as well as applications and procedures associated with operation and installation of these pumps. With the completion of this course, participants will be equipped with the basic knowledge required to commission, install, maintain, and repair dynamic pumps and their related systems.

COURSE CONTENT

- Identification
  - Types of dynamic pumps
  - Components and construction
- Pumping theory
  - Pressure head theory
  - Dynamic suction lift theory
  - Dynamic discharge head
  - Total dynamic head theory
  - Total static head
  - Friction head
  - Static suction lift and head
  - Static discharge head
  - Cavitation
  - Aeration
  - Vapor pressure
  - Slip (slippage)
  - Hydraulic efficiency
- Maintenance and diagnostics
  - Repairing dynamic pumps
  - Troubleshooting
  - Repair and replacement

AUDIENCE

Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Some form of technical or mechanical awareness course

Valve Maintenance and Repair

Skill – 3 Days

The purpose of this course is to develop in participants a working knowledge of various valves, as well as the different procedures and regulations associated with their maintenance and installation. After completing this course, participants will be equipped with a basic knowledge of valve type, construction, maintenance, and repair.

COURSE CONTENT

- Identification and construction
- Materials and service ratings for valves
- Terminology
- Types of valves
- Installation
- Procedures
- Position, location, and accessibility

AUDIENCE

Mechanical technicians working in the field; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Awareness of piping and piping system operations

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Machinery Diagnostics and Analysis

Skill – 2 Days

This 2-day course is designed to provide participants with the necessary knowledge to work within a mechanical maintenance team and be a positive influence in a mechanical and technological environment. Participants will learn about the technology related to machinery diagnostics and analysis, as well as preventive maintenance techniques so that they can identify different problems associated with rotating machinery, as well as the most efficient way to analyze these problems with the machinery.

COURSE CONTENT

- Vibration analysis and nondestructive testing (NDT)
  - Imbalance
  - Misalignment
  - Dye penetrant
  - Magnetic flux and X-ray
- Thermography and fluid analysis
  - Thermography methods and equipment
  - Spectrometric analysis
  - Conditioning analysis
  - Preventative and predictive maintenance

AUDIENCE

Mechanical technicians working in the field, employees working with equipment purchasing, procurement, storage, and job planning, as well as immediate supervisors to the working technicians

PREREQUISITE

Completion of a mechanical or technical awareness training course

Maintenance, Testing, and Diagnostics

Skill – 5 Days

This 5-day course covers testing and diagnostics to provide participants with a working knowledge of the various testing procedures and the science behind them, how to inspect and analyze these procedures failures and failure rates, and troubleshoot the concepts and values involved with the diagnostics and root-cause analysis of these failures. After the completion of this course, participants will be equipped with tools to prepare maintenance programs and analyze basic data associated with the failures through testing and diagnostics. Participants will also acquire the basic knowledge required to test and diagnose problems associated with piping, valves, and the associated equipment and systems.

COURSE CONTENT

- Preventive and Predictive Maintenance
  - Terminology
  - Types of maintenance
  - Purpose and application
  - Sources of developmental information
  - Maintenance practices
  - Procedures used to record data
- Vibration analysis
  - Terminology, tools, and equipment
  - Hazards and safe work practices
  - Causes, analysis methods, and applications
- Testing and detection procedures
  - Types of destructive testing
  - Destructive versus nondestructive
  - Testing material toughness
  - Visual inspection on pipe welding
  - Dye penetrant
  - Damage vibration can cause in equipment

AUDIENCE

Mechanical technicians in the field, employees working with equipment purchasing, procurement, storage, and job planning, as well as immediate supervisors to the working technicians

PREREQUISITE

Awareness training in mechanical and electrical systems, familiarity with rotating machinery and equipment, as well as the processes associated with these operations

Introduction to Oil Field Surface Facilities Operations with Simulator

Foundation – 5 Days

This 5-day course introduces the basic types of equipment and mechanical systems used in oil and gas production facilities. The objective is for participants to develop an understanding of the function and control of key equipment. The course includes a substantial simulation component to enhance understanding of production system operation and performance.

COURSE CONTENT

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  - Overview of oil and gas production systems
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  - Tank systems pump and tank systems
- Compressor Operation
  - Reciprocating compressors
  - Centrifugal compressors
  - Troubleshooting compressor operation
- Instrumentation and system control
  - Introduction to instrumentation
  - Troubleshooting instrumentation
  - Process control
  - Well system control
  - Diagnosing control issues
- Introduction to production operations
  - Monitoring well operation
  - Alarms and interlocks
  - Abnormal situation management
  - Optimizing well production
  - Troubleshooting production issues
  - Environmental system operation
  - Practice on the Simtronics DSS-100 Process Simulator, including SPM-3010 advanced gas-oil separation process, and SPM-3100 Amine Treating Unit

AUDIENCE

Entry-level operation engineers and technician

PREREQUISITE

None. Familiarity with basic mechanical equipment used in energy production is
# Process Technician Operations and Maintenance

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked for while technical courses that use software have been marked for, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

### Domain

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<th>Utility and Water Injection Systems</th>
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<th>Gas Systems</th>
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<td>Surface Wellhead System</td>
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<td>Gas Sweetening</td>
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<td>Introduction to Oil Field Surface Facilities Operations with Simulator</td>
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Power Generation System
Skill – 3 Days

Participants of this 3-day course will gain insight into oil and gas plant utilities and the various systems that store or produce inputs required for safe and efficient operation. The focus of this course will be one of these components, the power generation and distribution system. Participants will gain a basic knowledge of the safe operation, maintenance, repair, and management of equipment associated with power generation and distribution. The course emphasizes the extreme importance of these systems to the safe and efficient operation of the entire plant.

COURSE CONTENT
- Electric power distribution
- System operation and safety
- Interrelationships among process, equipment, instruments, and controls
- Concepts of cogeneration
- Gas turbines: operation, troubleshooting, maintenance
- Compressors: operation, troubleshooting, maintenance
- Startup, shutdown, and normal operation procedures
- Steam turbines and diesel systems
- Principals of operation, troubleshooting, and maintenance
- Diesel storage distribution and bunkering
- Emergency power generation

AUDIENCE
Process operators and process technologists; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas facility terminology

Oil Export Systems Operations
Skill – 2 Days

This 2-day course discusses the operating procedures and the most modern modes of transporting crude oil. Participants will learn about the various means of transporting crude, such as pipelines, tankers, and land vehicles. Hardware that is located at the crude sending and receiving terminals will also be covered. Safety, quality control, and custody are all important parts of moving crude oil and will be discussed.

COURSE CONTENT
- Export types
- Pipelines (land and marine)
- Marine (tanker, barge)
- Surface (truck, rail)
- Export operation
- Crude oil receiving
- Off-loading facilities
- Export operations quality control and maintenance
- Safety and regulatory compliance
- Environmental concerns

AUDIENCE
Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel

PREREQUISITE
Exposure to oil and gas facility terminology

Two-Phase Separation
Skill – 2 Days

This 2-day course will provide participants with the knowledge necessary to understand the two-phase separation process. Discussions will focus on the principles of operation of two-phase separation, as well as the different kinds of separators that are used in the oil and gas industry. Participants will be exposed to the operation of a separator, its internal parts, and the associated equipment used to support the two-phase separation process. After completing this course, participants should have gained an understanding of the technology related to two-phase separation within the industry.

COURSE CONTENT
- System overview
- Flow diagram
- Principle of operation
- Vertical and horizontal separators
- Types of separators
- Components and features
- Internal parts
- liquid capacity
- Control
- Pressure relief
- Safety and ESD considerations

AUDIENCE
Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas facility terminology

Subsea Wellhead Systems
Skill – 4 Days

Subsea wellhead systems consist of wellheads mounted on the seabed that are connected by piping systems. Considering the environment in which these systems are installed, they comprise highly reliable hardware components to ensure the integrity of the systems. Subsea systems also require high-integrity power systems that ensure that the proper levels of energy are provided to operate the subsea wellhead hardware. Course attendees will learn how subsea wellhead systems are developed and how the hydrocarbons are gathered and brought to the surface for collection. They will become familiar with the power and control systems used in subsea wellhead systems and will be exposed to the various parts used to connect multiple subsea wellheads. Participants will learn about the operation of the subsea wellhead and the Christmas tree, as well as learn about managing risk and making subsea wellhead systems more reliable.

COURSE CONTENT
- Subsea wellhead systems
- Subsea field development
- System architecture
- Subsea distribution system
• Component design parameters
• Subsea wellhead control
• Types of control systems
• Topside equipment
• Subsea control module
• Subsea power system
• Subsea equipment
• Subsea manifold components
• Manifold design and analysis
• Installation of subsea systems
• Pipeline ends and in-line structures
• Subsea connections and jumpers
• Subsea wellhead completions
• Subsea Christmas tree
• Subsea risk and reliability
• Safety considerations and environmental impact assessment

AUDIENCE
Process operators, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to subsea wellhead terminology

Control Room Operations

Skill – 3 Days

This 3-day course will give participants the knowledge necessary to understand control room operation in the oil and gas industry today. The purpose of a control room is to serve as an operations center where a service or facility can be monitored and controlled. State-of-the-art installations will typically require an operator control room and a process computer room. The various types of equipment used in the operator control room will be discussed, including CRT-based consoles, printers, video, copiers, annunciator panels, recorders, and possible backup panels. All equipment required for operator interface with the process is contained in the operator control room. Communication between the field operator and the control room operator is vital for successful operation in the process industry, and participants will gain an understanding of the interactions required between the two positions.

COURSE CONTENT
• The plant control system
• System interfaces
• Communications and control room environment
• Control room layout and ergonomics
• Emergency response role
• Control room operations
• State of readiness: control emergency and critical situations
• Integrated process systems and remote control operation
• Controlling a production process
• Preparing equipment for normal operation and maintenance
• Control room emergency response

Heat Transfer Equipment

Skill – 3 Days

Participants in this course will be introduced to heat transfer equipment, which assists in the transfer of heat from one fluid to another. A heat exchanger is the most common heat transfer equipment used in the oil and gas production industry. This course will provide participants with a good understanding of the different types of heat exchangers and their applications. In addition, attendees will learn about the construction, configuration, and operation of heat exchangers and hot oil systems. Participants will also gain an awareness of preventive maintenance, inspection, and repair of heat exchangers.

COURSE CONTENT
• Heat theory, thermal properties, and corrosion
• Heat transfer theory and types of heat transfer
• Thermal properties of materials
• Causes and prevention of corrosion
• Exchanger types, configurations, operation, inspection, and maintenance
• Types and Tubular Exchanger Manufacturers Association designation
• Destructive, nondestructive, and hydrostatic testing
• Heat exchanger maintenance and repair
• Hot oil system: types, applications, and safety
• Types, components, and applications
• Flow diagram and P&IDs
• Process and employee safety concerns

AUDIENCE
Process technicians, process technologists, instrumentation personnel, and maintenance personnel; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas facility terminology

Production and Test Separation Systems

Skill – 3 Days

Separators are typically installed immediately downstream of the wellhead and are responsible for the initial, gross separation of well fluids. They are pressure vessels, often capable of handling fluids from high-pressure wells. The purpose of this course is to develop in participants a working knowledge of separation systems and the science behind them. This course will explore the different types and functions of a separator. Attendees will learn about the methods used to enhance the separation process. Instrumentation and safety features found on production and test separators will be discussed, as well as the maintenance and inspection of these devices. Participants will also learn about the operation of separators, as
well as the internal construction and hardware features. HSE issues associated with separators will also be discussed.

**COURSE CONTENT**

- Production and test separation systems
- System overview
- Classification of oil separators
- Primary functions of oil separators
- Secondary functions of oil and gas separators
- Methods used to remove gas from oil in separators
- Separator control and maintenance
- Controls, valves, and accessories
- Safety equipment
- Operation and maintenance considerations
- Separator operation
- Components
- Operating safety

**AUDIENCE**

Process technicians, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology

**Gas Metering System**

**Skill – 2 Days**

This 2-day course covers the basics of physical and chemical makeup of gas mixtures and how the mixtures are affected by temperature and pressure. The fundamentals of volume determination devices will be reviewed. Custody transfer, which takes place any time fluids are passed from the possession of one party to another, will also be discussed. Participants will learn how remote gas well sites require local metering of the gas flow rate for asset and revenue accounting purposes. After completing the course, participants will understand how to operate a custody transfer system for natural gas and in such a way as to minimize systematic errors and ensure accuracy.

**COURSE CONTENT**

- Custody transfer requirements
- Industry and regulatory standards and gas acceptability criteria
- Contractual agreements between custody transfer parties
- Metering methods and equipment
- Components, accuracy, and custody transfer
- System flow diagrams and P&IDs
- Metering skids, measurement, and sampling systems
- Systemic error, bias, and uncertainty

**AUDIENCE**

Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel; employees working with purchasing and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology

**Surface Wellhead System**

**Skill – 2 Days**

In oil and gas production, every well must have a means of controlling the flow of hydrocarbons to their respective collection facility. The accepted equipment used during this process is called the Christmas tree. This 2-day course covers the equipment and operation of surface wellhead systems, which will include the Christmas tree and the connections to the surface casing. It also covers the components of the Christmas tree, which consists of an arrangement of valves and piping that allows isolation and flow control of the well. An understanding of the wellhead casing and tubing will also be provided to explain the connection of the Christmas tree.

**COURSE CONTENT**

- Surface and subsurface wellhead systems
- Surface wellhead and Christmas tree
- Casing string
- Surface wellhead system
- Wellhead subsystem components
- Surface Christmas tree
- System and valves
- Christmas tree wellhead common components
- Christmas tree operation and controls

**AUDIENCE**

Process operators, process technicians, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas surface wellhead system terminology

**Safety Shutdown Systems**

**Skill – 3 Days**

The purpose of this course is to develop in participants a working knowledge of various safety instrumented systems (SISs), including the total plant shutdown (TPS), emergency shutdown (ESD), process shutdown (PSD), and unit shutdown (USD) systems. An introduction to the different systems, as well as to the design philosophy of the SIS, will be provided. Differentiation between function of the control system versus the SIS will be discussed, as well as the levels of protection with respect to the risks present. Evaluating and functionally testing an SIS will also be covered. Attendees will learn how changes to the SIS must be managed to ensure reliability. Permissives and interlocks are the basis of these systems and will be covered, along with logic solvers, which are an important part of shutdown systems.

**COURSE CONTENT**

- Introduction to SIS
- Design life cycle
- Process control versus safety control
- Protection layers
- Safety integrity levels
- Introduction to TPS, ESD, PSD, and USD
- Permissives and interlocks
- High-reliability logic solver
**Fire Water Systems**

*Skill – 2 Days*

The purpose of this course is to develop in participants a working knowledge of how fire prevention and control is achieved by combining engineering, work practice, and administrative controls. Fire water systems provide an adequate water supply for firefighting, vessel, and structural cooling in the event of a fire within the plant. Participants will gain a good understanding of the fire water system and other associated extinguishing systems that must all work simultaneously to deal with industrial fire situations. This course provides the basic knowledge for the safe operation, maintenance, and management of equipment associated with firefighting systems. The course emphasizes the extreme importance of these systems to the safe and efficient operation of the entire plant.

**COURSE CONTENT**

- Industrial firefighting systems
- Fire water supply
- Active and passive systems
- Flow diagram
- Fire water supply, equipment, and components
- Compliance issues
- Foam, sprinkler, carbon dioxide, and deluge systems
- Foam types, concentrations, properties, and comparisons
- Wet and dry pipe sprinkler systems
- Advantages and application of carbon dioxide systems
- Types and applications of deluge systems

**AUDIENCE**

Process operators, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to shutdown system terminology in the oil and gas industry

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**Chemical Treatment**

*Skill – 2 Days*

This 2-day course will provide participants with the basic knowledge for the safe operation and management of chemical treatment systems. The course will emphasize the extreme importance of these systems to the safe and efficient operation of the entire plant. Discussions will focus on the hardware needed to provide chemical injections in a plant environment. The various types of chemicals that are used in a typical oil and gas installation will also be reviewed. As the course progresses, participants will be exposed to the operating criteria for chemical injections, as well as the characteristics of the chemicals and the safety aspects that must be considered.

**COURSE CONTENT**

- Chemical injection systems
- Documentation
- Pumps
- Associated hardware
- Types of chemicals
- Operation of chemical injection systems
- Criteria to select proper chemical injection
- Characteristics of various chemical treatments
- Chemical safety

**AUDIENCE**

Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel

**PREREQUISITE**

Exposure to oil and gas facility terminology

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**Gas Sweetening**

*Skill – 2 Days*

Sour natural gas compositions can vary over a wide concentration of hydrogen sulfide, carbon dioxide, and hydrocarbon components. This 2-day course focuses on the removal of H2S and CO2 from sour gas, a process called sweetening. The end user of natural gas must be assured that the gas meets sales-gas specifications and that the supply of gas must be available at all times at the contracted rate. Participants will gain an understanding of gas-treating facilities, how they must be designed to convert a particular raw gas mixture into a sales gas that meets specifications, and how such facilities must operate without interruption. This course will provide participants with the fundamental knowledge of gas sweetening and its operation as applied in today’s oil and gas industry.

**COURSE CONTENT**

- Gas purification processes
- Types of processes
- Flow diagrams and P&IDs
- Process equipment and its purpose
- Safety and environmental concerns
- Gas treatment absorbers
- Alkanolamines
- Operational issues of amine sweetening
- Bulk CO2 removal by membrane unit

**AUDIENCE**

Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel

**PREREQUISITE**

Exposure to oil and gas facility terminology

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Visit NExTTraining.com/classes for the latest calendar or to register for a course.
Electrical Submersible Pumps (ESPs)
Skill – 2 Days

This 2-day course reviews the operational requirements for electrical submersible pumps. Participants will learn why ESPs are required to bring hydrocarbons to the surface when the natural pressure of a production well begins to decrease. They will also be made aware of the features built into ESPs, their components, and how ESPs are installed. Attendees will be exposed to ESPs that are used in special conditions to extract the maximum amount of hydrocarbons from the wells and how they can be configured to work in different places in the well tubular. Participants will also be exposed to the equipment used to monitor ESP performance, along with troubleshooting techniques. After completing this course, participants should have a better understanding of the technology related to ESPs used within the industry.

COURSE CONTENT
- ESP applications and installation
- Artificial lifting
- Operational features of ESPs
- ESP installations
- ESP components
- ESP special applications, monitoring, and troubleshooting
- ESP equipment in special conditions
- Special ESP installations
- ESP downhole monitoring
- ESP troubleshooting
- General causes of system failures

AUDIENCE
Process technicians working in the field; equipment purchasers, procurement and storage personnel, and job planners; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas drilling and well production terminology

Instrument, Utility Air, and Nitrogen Systems
Skill – 2 Days

Utility systems like air and nitrogen are critical parts required to operate and maintain an industrial plant setting. Compressors are required to supply nitrogen and air throughout the plant. Instrumentation is required to monitor and control these systems, and they must also be monitored by the emergency shutdown (ESD) system. Participants will gain the basic background required for the operation, maintenance, and management of equipment associated with instrument air, utility air, and nitrogen systems. The course will emphasize the importance of these systems and how they impact the safe and efficient operation of the entire plant. It also covers preventative maintenance as well as the HSE impact associated with these systems.

COURSE CONTENT
- Utility and air systems
- Air distribution
- Air compressors and associated equipment
- Startup and operation
- ESD interface
- Nitrogen systems
- System purpose/safety concerns
- Nitrogen distribution
- Nitrogen gas generator and associated equipment
- ESD Interface
- Routine and shutdown maintenance

Crude Oil Storage Tanks
Skill – 3 Days

This course will focus on the fundamentals of different types of crude oil storage tanks. In order to operate tanks safely, participants will learn about fire protection and venting systems. Attendees will learn about crude tank operations, including gathering systems, shipment, routine tank process, and maintenance. The scheduled maintenance activities on the mechanical, electrical, and instrumentation hardware will be covered as well. Tank cleaning and tank protection systems will also be discussed. After completing this course, participants will better understand the technology related to crude oil tanks within the industry.

COURSE CONTENT
- Fire and gas hardware
- Hazards and hardware
- Alarm indication
- Distributed control system
- Final control elements
- Fire and gas operation
- Testing and maintenance
- Confirmed fire and gas

AUDIENCE
Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to fire and gas system terminology in the oil and gas industry
COURSE OFFERINGS

• Tank fundamentals
• Fire protection
• Venting
• Emissions
• Accessories
• Tank operations and routine maintenance
• Crude transportation and storage
• Crude oil cargo handling
• Shipment, receipt, and transfer
• Water draw
• Tank lot, roof drainage, and tank gauging
• Tank inspection and maintenance
• Pipe and pipe-fitting procedures
• Tank instrumentation maintenance
• Safety systems

AUDIENCE
Process operators, process technicians, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to crude tank terminology

Gas Compression and Dehydration System

Skill – 2 Days

Dehydration is an important process in offshore gas processing. Gas is dehydrated offshore to avoid the dangers associated with pipeline transport and processing of wet gas. This 2-day course will cover the basics of gas compression and dehydration. The characteristics and operation of various types of compressors will also be covered. As the course progresses, discussions will focus more on the process of dehydration. The discussion will include the impacts of pressure and temperature on the process, as well as safety and ESD considerations.

COURSE CONTENT
• Compression and need for dehydration
• Overview
• Gas hydrates
• Documentation
• Types of compressors
• Dehydration
• Types of dehydration
• Flow diagram
• Operation
• Safety and ESD considerations

AUDIENCE
Process technicians, process technologists, instrumentation personnel, and safety and maintenance personnel

PREREQUISITE
Exposure to oil and gas facility terminology

Water, Oil, and Gas Sampling and Analysis

Skill – 3 Days

This 3-day course covers the basics of automatic and manual sampling of water, oil, and natural gas for the determination of the chemical composition and heating values. The chemistry-related problems of mineral scales, corrosion, bacteria, and oily water will be generally reviewed. It also provides an overview of the operation, calibration, and maintenance of analyzers, while addressing the design, installation, operation, and maintenance of odorant injection and detection systems. This course will also teach participants the importance of accurate and reliable sampling that allows both buyer and seller to be confident of a fair transaction.

COURSE CONTENT
• Water sampling
• Sampling methods and systems
• Locations and hazards
• Sample quality and integrity
• Water quality, analysis, criteria, monitoring, and assessment
• Oil sampling
• Apparatus
• Manual sampling considerations and special precautions
• General sampling procedures and types
• Gas sampling
• Sampling methods and systems
• Locations and hazards
• Sample quality and integrity
• Analysis, criteria, monitoring, and assessment

AUDIENCE
Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas facility terminology

Drain Systems

Skill – 2 Days

This 2-day course will give participants an overall understanding of the safe operation and hazards associated with drain systems found in the oil and gas industry. Drain systems are used to safely dispose of all liquids spilled, drained from equipment, or resulting from wash-down activities in oil and gas processing facilities. Participants will gain a working knowledge of closed drains, which are used for drainage water from process areas, and open drains, which are used for drainage water from nonprocess areas. Attendees will be exposed to the environmental impact issues associated with uncontrolled contaminated surface runoff and the importance of controlling all process areas to ensure drainage water flows into the closed drainage system. After completing this course, participants will have an understanding of equipment and components associated with the systems.

COURSE CONTENT
• Drain systems overview
• Surface water drainage (open and closed systems)
• Equipment oily water drainage (closed system)
• Layout, capacity, isolation, and sectioning

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

Software
Technical courses that use software
Includes practical sessions
Field trips
Uses simulation

COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

Software
Includes practical sessions
Field trips
Uses simulation

• Interface requirements
• Safety and environmental requirements
• Closed drain and oily water treatment
• Commissioning requirements
• Principles of operation, treatment, and handling
• Inlet and outlet facilities
• Operational and maintenance requirements
• Safety and environmental requirements

AUDIENCE

Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Exposure to oil and gas facility terminology

Oil Desalting System

Skill – 2 Days

Oil desalting systems provide protection to capital-intensive processing equipment by removing the salt component from crude oil. This course provides participants with knowledge necessary to understand that the desalting operation is one that must be constantly adjusted to maintain optimum performance. The course will move from the fundamentals of the desalting process through to the various design options and major process variables. Discussion will also include topics on electrical desalting and the types of desalting systems. As the course progresses, discussion will focus on design considerations, components, operation, performance, and troubleshooting tactics used in desalting operations.

COURSE CONTENT

• Crude oil desalting
• General overview
• Electrical desalting
• Types of desalting systems
• Desalting operations
• Desalter components
• Desalter design considerations
• Factors that affect desalting operation and performance
• Types of desalting applications
• Desalting troubleshooting

AUDIENCE

Process technicians, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Exposure to oil and gas facility terminology

Gas Lift Systems

Skill – 2 Days

The focus of this 2-day course is on the installation, operation, and maintenance of gas lift systems. Participants in this course will learn about the basic principles of gas lift and why it is used. This will include information about the operation of a well and how hydrocarbons can flow under natural and artificial lift systems. The gas lift valves are one of the most important components in the gas lift system. Participants will learn about the various types of valves used and their operation. Along with the operation of the gas lift system, valve installation and removal will be covered. Common troubleshooting scenarios will also be discussed in this course.

COURSE CONTENT

• Gas lift systems
• Well evaluation
• Well drive pressure
• Gas lift valve types
• Gas lift valve use
• Operation
• Mechanisms
• Installation and removal
• Sizing
• Troubleshooting

AUDIENCE

Process operators, process technicians, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE

Exposure to hydrocarbon gas lift terminology

Cooling Water Systems

Skill – 3 Days

Industrial production processes need cooling water systems to operate efficiently and safely. Refineries, steel mills, petrochemical manufacturing plants, electric utilities, and paper mills all rely heavily on equipment or processes that require efficient temperature control. The purpose of this course is to develop in participants a working knowledge of the various cooling water systems and the science behind them. Attendees will gain an understanding of how cooling water systems control temperatures by transferring heat from hot process fluids into cooling water. Attendees will learn about the design of offshore platform cooling systems and how they provide all process and utility cooling for an entire platform. After completing this course, participants will be able to contribute to the safe operation and management of equipment associated with cooling water systems in oil and gas plants and platforms.

COURSE CONTENT

• Cooling water system overview
• Flow diagram and P&IDs
• Cooling system components and equipment
• Operation and maintenance
• Cooling water treatment
• Cooling water properties
• Monitoring and control
• Problems and solutions
• Platform cooling water treatment
• Flow diagram and P&IDs
• Glycol and seawater cooling
• Safe operation and maintenance of components and equipment
AUDIENCE
Process operators, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

PREREQUISITE
Exposure to oil and gas facility terminology

### Pigging Process
**Skill – 2 Days**

The purpose of this 2-day course will be to develop in participants a working knowledge of how to clean a pipeline by inserting a cleaning device, commonly known as a pig, at one end of the pipeline and allowing pipeline pressure to carry it to the other end. Participants will gain an understanding of the cleaning process as the pig travels through the pipe and scrapes the inner walls of the pipe to remove any buildup of unwanted material. Attendees will also learn about the different types of pigs available for various process applications. Smart pigs, which are highly sophisticated instruments that include electronics to collect various forms of data inside the pipeline, will be discussed, along with the associated hardware that must be maintained.

**COURSE CONTENT**
- Pigging equipment and programs
- What is pigging?
- Types of pigs
- Pigging equipment
- Pigging program considerations
- Pigging procedures
- Pig launching and receiving
- Line inspection tools
- Pig tracking
- HSE considerations

### Potable Water Systems
**Skill – 2 Days**

Potable water for human consumption has to comply with high quality standards regarding its chemistry, physics, and hygiene. These standards are defined globally by the potable water standards issued by the World Health Organization as well as similar individual standards in the US, Canada, and Europe. Participants will gain the basic knowledge necessary for the safe operation and management of equipment associated with potable water systems in oil and gas facilities. The 2-day course emphasizes the importance of monitoring and controlling the potable water system for the safe and efficient operation of the entire plant as well as for the welfare and safety of those who might utilize the system.

**COURSE CONTENT**
- Potable water system overview
- Legislative standards

### Oil Stabilization
**Skill – 2 Days**

The stabilization process is a form of partial distillation that sweetens “sour” crude oil (removes the hydrogen sulfide) and reduces vapor pressure, thereby making the crude oil safe for shipment in tankers. Stabilizer plants are used to reduce the volatility of stored crude oil and condensate. In this 2-day course, participants will learn about the stabilization process, the equipment within that system, and how the system operates. Participants will also be exposed to the control parameters in the stabilization process. They will become familiar with the process variables and chemical composition of the fluids that are involved in the stabilization process.

**COURSE CONTENT**
- Stabilization process
- Process overview
- Equipment
- Control schemes and operation
- Safety aspects
- Emergency shutdown considerations
- Stabilization system components
- Control parameters
- Operational variables
- Variables affecting crude oil stabilization

### Flare Systems
**Skill – 3 Days**

Pressure relief systems, including flare systems, are vital in the oil and gas industry for handling a variety of situations. In some cases, noncombustible gases, such as steam, air, and nitrogen, are safely vented to atmosphere. In other cases, elaborate systems for the safe and responsible disposal of vented gases may be required. The purpose of this course is to develop in participants a working knowledge of the different systems that are used for preventing pressurization above a system’s design pressure, for venting during an unusual or emergency situation, and for normal depressurization during a shutdown. This 3-day course will give participants...
the fundamental knowledge of relief and flare systems to enable them to safely conduct operating and maintenance procedures and to be aware of emergency operations as related to the plant process safety systems.

**COURSE CONTENT**
- Relief gas systems overview
- Flow diagrams and P&IDs
- Systems, equipment, and components
- System criteria and process safety management systems
- Relief gas system operation
- Technician responsibilities
- Monitoring systems and procedures
- Environmental and safety device regulatory compliance
- Thermal oxidizers
- Principle of operation
- Components and equipment
- Environmental compliance

**AUDIENCE**
Process technicians, process technologists, instrumentation personnel, and maintenance personnel; employees working with equipment purchasing, procurement, storage, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**
Exposure to oil and gas facility terminology

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**Oil Fiscal Metering**

**Skill – 2 Days**

This 2-day course discusses fiscal metering, which is commonly referred to as metering in the oil and gas industry. Metering is the point of a commercial transaction where a change in ownership takes place. Course participants will learn about the industry standards that govern custody transfer requirements, and they will also learn about the variety of metering methods available. Attendees will be exposed to the hardware used in a fiscal metering system. Accuracy, acceptable error, and documentation will be discussed to provide participants with a complete picture of the process.

**COURSE CONTENT**
- Custody transfer and metering methods
- Industry standards
- Legal
- National metrology standards
- Custody transfer flowmeters
- Fiscal metering requirements
- Components
- Accuracy
- Liquid custody transfer
- Fiscal metering hardware

**AUDIENCE**
Process technicians, process technologists, and laboratory and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**
Exposure to oil and gas facility terminology

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**Steam and Condensate System**

**Skill – 2 Days**

Steam is distributed from the boiler to all steam users in the plant. A dependable steam supply is essential for safe and efficient plant operation. In this 2-day course, participants will gain an understanding of the principles, use, and distribution of steam to the various users in the plant. They will also be exposed to the operation of a steam distribution system. Participants will learn about the steam condensate system, what is meant by steam condensate recovery, and some of the problems that can be encountered when dealing with steam condensate. Emergency shutdown (ESD) and process shutdown (PSD) considerations, as well as HSE issues, will also be discussed.

**COURSE CONTENT**
- Steam distribution system
- Properties of steam
- Uses of steam
- Steam distribution system overview and operation
- Steam condensate system
- Steam condensate overview
- Steam condensate recovery and problems
- ESD and PSD considerations
### Sewage System

**Skill – 2 Days**

Sewage treatment includes physical, chemical, and biological processes to remove contaminants in wastewater and sewage streams. Its objective is to produce an environmentally safe fluid waste stream and a solid waste suitable for disposal or reuse. In this 2-day course, participants will be exposed to typical sewage treatment systems through the use of process and instrumentation drawings and the types of initial treatment systems used in industry. Participants will also learn about the processes and systems used to treat and dispose of sewage once it has been through the initial treatment process. The HSE issues will also be discussed.

**COURSE CONTENT**

- Initial sewage treatment
- Initial sewage treatment flow diagram
- Primary and secondary treatment
- Sewage collection
- Odor control
- Secondary sewage treatment
- Package plants and batch reactors
- Sludge treatment and disposal
- HSE issues

**AUDIENCE**

Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology

### Seawater Lift and Circulation System

**Skill – 2 Days**

The seawater lift and circulation system supplies filtered seawater to process and drilling users. This system serves as a heat sink for the platform’s cooling requirements. In this 2-day course, participants will be exposed to typical seawater lift systems through the use of process and instrumentation drawings and an explanation of the pumps and major parts that make up this system. Additional topics that will be covered include operation, control, emergency shutdown (ESD) considerations, and the health and safety aspects of a typical seawater lift and circulation system.

**COURSE CONTENT**

- System overview
- Seawater lift flow diagrams
- Seawater lift components
- Seawater return
- Seawater lift pumps
- Seawater lift operations and control

**AUDIENCE**

Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology

### Heating, Ventilation, and Air Conditioning (HVAC) System Operation

**Skill – 2 Days**

This 2-day course provides an overview of HVAC systems used in industrial environments. HVAC systems contain inherent and potential dangers that make operations, monitoring, and proper handling of maintenance extremely important. Participants will gain an understanding of the major components and associated safety systems. Important elements such as heat transfer systems, ventilation, and air-conditioning operations will also be covered to provide participants with a complete understanding of the underpinnings of these systems. Attendees will learn about key operational functionality and monitoring, as well as HSE issues.

**COURSE CONTENT**

- HVAC systems
- HVAC thermodynamics
- Types of HVAC systems
- Heating
- Ventilation
- Air-conditioning
- HVAC operation
- Operation objectives
- Packaged heating and air-conditioning systems
- HVAC safety systems
- HSE issues

**AUDIENCE**

Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology

### Water Treatment and Injection System

**Skill – 2 Days**

This 2-day course is designed to provide participants with an overview of the different types of water treatment methods and water injection systems. In most offshore oil and gas reservoirs, oil and gas collects above large volumes of formation water. Participants will learn about these reservoirs and the process of pumping in seawater to maintain pressure and help the oil and gas flow from the reservoir to a production platform or facility. They will also gain knowledge of the water treatment systems and injection pumps that have been installed on the processing decks of these offshore platforms to send filtered and sterilized seawater into the reservoirs.

**COURSE CONTENT**

- Instrumentation and control
- ESD considerations
- HSE issues

**AUDIENCE**

Process technicians, process technologists, and maintenance personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to the working technicians

**PREREQUISITE**

Exposure to oil and gas facility terminology
Introduction to Oil Field Surface Facilities Operations with Simulator

**Foundation – 5 Days**

This 5-day course introduces the basic types of equipment and mechanical systems used in oil and gas production facilities. The objective is for participants to develop an understanding of the function and control of key equipment. The course includes a substantial simulation component to enhance understanding of production system operation and performance.

**COURSE CONTENT**

- **Introduction to basic equipment and systems for oil and gas production**
  - Overview of oil and gas production systems
  - Pumps
  - Tank systems pump and tank systems

- **Compressor Operation**
  - Reciprocating compressors
  - Centrifugal compressors
  - Troubleshooting compressor operation

- **Instrumentation and system control**
  - Introduction to instrumentation
  - Troubleshooting instrumentation
  - Process control
  - Well system control
  - Diagnosing control issues

- **Introduction to production operations**
  - Monitoring well operation
  - Alarms and interlocks
  - Abnormal situation management
  - Optimizing well production
  - Troubleshooting production issues
  - Environmental system operation
  - Practice on the Simtronics DSS-100 Process Simulator, including SPM-3010 advanced gas-oil separation process, and SPM-3100 Amine Treating Unit

**AUDIENCE**

Entry-level operation engineers and technician

**PREREQUISITE**

None. Familiarity with basic mechanical equipment used in energy production is required.
Leadership and Communications

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
First Time Leadership and Supervision

Foundation – 5 Days

As international companies move toward a flatter, team-based structure, supervisors and team leaders will need to learn how to combine a leadership role with full-time operational responsibilities. This course will be aimed at developing core leadership and supervisory skills in people who are new to this role. Participants will learn how to manage themselves and their time, how to delegate effectively and motivate staff, and how to apply coaching, problem-solving, and conflict management skills to improve team performance. The majority of this course will consist of group activities, case studies, and simulations designed to give participants practice and build their confidence in preparation for a smooth transition into leadership.

COURSE CONTENT
- Managing yourself and your time
- Characteristics of successful leaders and supervisors
- Moving up to leadership and supervision
- The ABCs of planning
- How to set realistic action plans for teams
- How to communicate effectively in international organizations
- Using active listening, questioning, and responding techniques
- How to set up and run productive meetings
- Effective techniques to motivate a team and its individual members
- How to delegate: learning to let go and spread the workload
- Using delegation as a development tool
- Coaching for staff development
- Coaching to improve team performance
- Structured problem solving and decision making
- Conflict management styles
- Conflict resolution model
- Managing stress at work
- Stress chain
- Relieving negative stress

AUDIENCE
New leaders and supervisors or those preparing for management; recommended before attending the International Management Skills course

PREREQUISITE
None

Navigational Leadership

Foundation – 2 Days

The Navigational Leadership program is a proven, straightforward, and highly effective 2-Day workshop designed to help leaders unlock potential and engagement in others. Navigational Leadership is about guiding and developing versus telling. The program equips leaders with easy-to-apply tools that guide others toward success, toward greater levels of job satisfaction, and toward higher levels of personal and professional potential. The navigation analogy clarifies core coaching principles and processes in a way that is both enjoyable and memorable.

COURSE CONTENT
- Coaching mind-set and coaching principles
- The five functions of Navigational Leadership
- The six guiding principles of Navigational Leadership
- The Navigational Leadership model
- The art of conscious listening
- The art of the question part 1
- The art of the question and deepening the coaching conversation model
- The art of the question part 2
- The Navigational Leadership model in depth
- The art of telling
- Integrating feedback into the coaching conversation model

AUDIENCE
Organizational leaders interested in enhancing their capacity to develop others through effective coaching conversations

PREREQUISITE
None

Communication and Conflict Management

Foundation – 2 Days

This course will enable participants to deal with the complexities of communication and will give them the tools to handle conflict situations. Attendees will learn to combine strength with sensitivity in order to resolve conflicts. Furthermore, they will learn to appreciate the ability to be honest and forthright while still being respectful of the feelings of others. This program will show participants how to handle communication challenges with confidence, openness, and competency. Attendees will receive the skills required to deal with conflicts in typical workplace situations and evaluate their own unique communication style. They will learn a series of communication models that will help them deal with any potential workplace conflicts. Potentially destructive behaviors such as temper tantrums, one-upmanship, personal squabbles, and passive-aggressive behavior will be covered.

Surviving Office Chaos - Managing Time, Meetings, and Conflict

Foundation – 4 Days

In this 4-Day course, participants will acquire skills that will allow them to accomplish more in less time, recognize real priorities, keep track of several projects, and establish and meet deadlines. Participants will discover how to deal with changing deadlines easily and how to get priority projects done on time. Attendees will also learn how to plan and conduct meetings to maximize
involvement and engagement. They will be able to develop an action plan using effective meeting practices, including setting agendas, developing ground rules, and following up. They will gain an understanding of the methods for communicating effectively, while taking advantage of their own communication style and strengths. Participants will learn the power of listening, along with reading body language. The course will cover how to handle conflict using assertiveness skills and appropriate communication techniques. Participants will understand the power of knowing how to carefully select battles.

**COURSE CONTENT**
- Activity assessment
- Priorities
- Organization
- Habits
- Factors contributing to effective meetings
- Effective meeting practices
- Tools for better meetings
- Components of communication
- Style assessment
- Effective listening, including 2-way communication techniques
- Communication that builds consensus and solves problems
- Assertiveness versus aggressiveness
- Approach for conflict
- Communication techniques for conflict resolution
- Provide employee feedback, praise, and criticism
- Constructively give and receive criticism and confrontational messages
- Communicate for confrontations: giving orders

**AUDIENCE**
Participants interested in improving their skills in time and meeting management

**PREREQUISITE**
None

### Building a Culture of Innovation

**Foundation – 2 Days**

This introductory 2-Day workshop is designed to provide participants with an understanding of innovation in the workplace, the importance of supporting and building an innovative culture, and leading practices in the field. Key characteristics and behaviors of innovators will be discussed, along with some ways in which employees can be empowered to build innovation skills. Participants will leave with basic tools and resources to begin to build a culture of innovation and creativity in their teams and organizations. Participants will be given the opportunity to explore their own organizational culture in the context of innovation and creativity and to build creative thinking skills and attitudes.

**COURSE CONTENT**
- What is innovation?
- Organizational culture and innovation
- Why culture matters to innovation
- Diagnosing and measuring your innovation culture
- Managing innovation
- What does an innovative employee look like?
- Conceptual creativity
- Mind-set

- Measuring the innovativeness of your team
- Taking action to build an innovative team

**AUDIENCE**
Emerging and frontline leaders

**PREREQUISITE**
None

### Difficult Conversations, Productive Conflict, and the Art of Negotiation

**Foundation – 3 Days**

It is a well-known fact that a degree of conflict in the workplace will be required to create healthy dialogue, hear from all stakeholders, and find the best way forward. Unfortunately, few people are skilled in navigating the rocky waters of conflict and instead will either avoid it altogether or power through it, leaving behind the debris of hurt feelings and misunderstandings. This workshop introduces participants to strategies and tools for boosting one’s ability to deal with difficult personalities and habits, manage sensitive and difficult issues, and use difficult conversations as an opportunity for rich learning. This course will also enhance the participants’ communication and conversation ability and their active listening skills, as well as moving them from positional to interest-focused conflict resolution and negotiation.

**COURSE CONTENT**
- Difficult conversations
- Personal communication style
- Communication barriers and strategies
- Effective listening
- Practicing difficult conversations
- Questioning techniques for effective communication
- Productive conflict
- Personal conflict styles
- Where does my conflict style come from?
- Healthy and/or damaging conflict
- Proactive and detrimental responses to dealing with conflict
- Relationship between thoughts, feelings, and behaviors in difficult conversations and conflict
- Art of negotiation
- Common factors that defuse or exacerbate conflict
- My style and how to deal with conflict
- Conflict scenarios and exploration
- Effective negotiation skills and getting to yes (getting what you need)

**AUDIENCE**
Business leaders, executives, operational managers, and project and program managers who want to develop their competency in conflict resolution and negotiation; ideal for emerging and frontline leaders

**PREREQUISITE**
None
Navigational Leadership & Influential Conversations

Foundation – 3 Days

This program is a proven, straightforward, and highly effective 3-Day workshop designed to help leaders unlock potential and engagement in others. Navigational Leadership is about guiding and developing versus telling. The program equips leaders with easy-to-apply tools that guide others toward success, toward greater levels of job satisfaction, and toward higher levels of personal and professional potential. The navigation analogy clarifies core coaching principles and process in a way that is both enjoyable and memorable. The final day focuses on influential conversations and helps leaders build influence that matters.

**Course Content**
- Coaching mind-set and coaching principles
- The five functions of Navigational Leadership
- The six guiding principles of Navigational Leadership
- The Navigational Leadership model
- The art of conscious listening
- The art of the question part 1
- The art of the question and deepening the coaching conversation model
- The art of the question part 2
- The Navigational Leadership model in depth
- The art of telling
- Integrating feedback into the coaching conversation model
- Influential conversations
- How to map networks of influence and identify key points of leverage
- Four approaches to initiating change in others
- A structure for conducting an influential conversation
- The role of likability in influence and how to be more likable
- How to plan an influential conversation

**Audience**
Organizational leaders interested in enhancing their capacity to develop and influence others through effective conversations

**Prerequisite**
None

Personal Breakthrough Impact

Foundation – 3 Days

Being effective and having an impact helps to increase productivity and overall job satisfaction. Effectiveness with others always starts with self-effectiveness, and self-effectiveness starts with self-awareness. This course will help participants gain self-awareness in order to help them become better leaders in their industry. As people grow in self-awareness, they will begin to understand their strengths and natural talents, along with how to capitalize on them. Self-awareness also helps people to better understand their motivational drivers and their energy drainers. In turn, it enables them to develop their personal strategy for action. Enhanced self-awareness in a leader will be the key to understanding others and also to developing an effective approach that will generate the best results from their team.

**Course Content**
- Introduction to self-awareness and communicating with impact
- The importance of self-awareness and impact
- Personality and communication styles

Mindful Leadership Workshop - Introduction

Foundation – 2 Days

Learning and practicing mindful awareness has been shown to decrease symptoms of stress, build confidence, and improve energy and enthusiasm. It has also been shown to assist leaders in facing the inevitable uncertainty and complexity of their role with a rational and calm thought process. This ability for calm under pressure in the midst of chaos is the hallmark of an influential and inspirational leader. This workshop builds on the introductory Mindful Leadership workshop, in which participants began the process of self-awareness leading to a personal leadership vision. In the advanced workshop, participants will further explore how their reactions, emotions, thoughts, and beliefs positively or negatively influence their work, relationships with colleagues, and work environment.

**Course Content**
- Mindful leadership and emotional intelligence
- How have participants been using the strategies to improve their leadership practice?
- What were some of the challenges and successes?
- Personal spheres of influence
- Power and leadership
- Leadership style and situational analysis
- Personal leadership vision
- Detrimental patterns
- Effective emotional responses for effective leadership
- Personal leadership values
- Leadership vision

**Audience**
Frontline and senior leaders who wish to develop their emotional intelligence and awareness to be more effective leaders

**Prerequisite**
Mindful Leadership Workshop—Introduction
Effective Time and Meeting Management

**Foundation – 2 Days**

In this 2-Day class, participants will acquire skills that will enable them to accomplish more in less time, recognize real priorities, keep track of several projects, and establish and meet deadlines. Participants will learn how to handle difficult priorities, demands, and stress-filled schedules. They will also learn methods for handling day-to-day tasks, as well as larger projects and long-range goals, and how to utilize innovative plans for prioritizing multiple requirements. Participants will discover how to deal with changing deadlines easily and how to get important tasks done on time. Participants will also learn how to plan and conduct meetings in order to maximize involvement. They will become able to develop an action plan using effective meeting practices, including setting agendas, developing ground rules, and following up. They will also discover how to deal with the most common group problems and how to facilitate discussion.

**COURSE CONTENT**

- Time management
- Activity assessment
- Priorities
- Organization
- Time-saving habits
- Effective meetings
- Factors contributing to effective meetings
- Effective meeting practices
- Tools for better meetings

**AUDIENCE**

Anyone interested in improving their skills in time and meeting management

**PREREQUISITE**

None

Managing Teams Across Global Boundaries

**Skill – 2 Days**

This 2-Day course will address cultural issues that face managers of employees who must work together but have different styles and values. Participants will learn what global teams need from their leaders and how to achieve those needs. This course will include group activities, exercises, and case studies designed to give participants practice and help build their ability to manage global teams. In this 2-day class, leaders will learn the importance of developing trust, which is vital to maximizing employee productivity and cooperation. This class will cover generational as well as cultural issues that face managers of employees who have different styles and values.

**COURSE CONTENT**

- Dimensions of culture
- Components of culture
- Diverse work team characteristics
- Effective team management styles
- Managing and communicating with teams across cultural boundaries
- Effective communication media across cultures
- Challenges associated with English as a second language

**AUDIENCE**

Supervisors, managers, project managers, and team leaders involved with multicultural teams operating across the globe

**PREREQUISITE**

None

Essential Coaching Skills for Managers

**Skill – 3 Days**

Effective coaching can unlock employee potential and improve motivation, as well as, in most cases, be far more beneficial than other forms of training and development methods.

This 3-Day course will provide attendees with the confidence, skills, and techniques to conduct coaching effectively. Participants will learn about the difference between coaching and mentoring and how to ensure that the correct coaching method for the situation is applied. Participants will learn about coaching models (e.g., GROW, Solution Focused, 4 Stage Model), along with directive and nondirective approaches to coaching. Attendees will also learn about powerful questioning techniques and how to give effective feedback, culminating in producing active individual development plans. They will learn to understand the ethics and guidelines aligned with coaching. In addition, participants will also learn how to apply the same techniques to running a group or team coaching session.

**COURSE CONTENT**

- Overview of coaching
- Coaching as part of an organizational development strategy
- Coaching versus mentoring and other development options
- Directive and nondirective approach
- Ethics, guidelines, and establishing the coaching contract
- Use of psychometrics in coaching development
- How and why people learn: people development methodologies and theories
- Skills needed for coaching
- Coaching models: GROW, Solution Focused, and 4 Stage Coaching Model
- Directive and nondirective development communication
- Building rapport (essential communication skills)
- Creating really powerful questions
- Active-listening skills
- Framing the coaching session: getting the best from an individual
- Structuring an individual coaching program
- Practical coaching sessions
- Giving effective and powerful feedback
- Building active development plans and coaching diaries and logbooks
- Coaching practice
- Group and team coaching

**AUDIENCE**

Managers and senior managers of people or teams from any discipline who wish to learn to coach effectively

**PREREQUISITE**

None

The Wellsite Coach

**Skill – 3 Days**

In the oil and gas industry, a wellsite coaching methodology is becoming a more widespread tool to help managers get the best performance out of their teams. In today’s fast-paced environment, managers and leaders combine three separate roles: expert in their domain, manager of people and processes, and coach to help others unlock their potential and contribute to the success of the team. Traditionally, in the oil and gas sector, the emphasis has been solely on the first
two, with little attention devoted to coaching. This 3-day course will help managers become more knowledgeable in the wellsite coaching technique and will help them recognize the situations in which this technique would encourage the best results from their team.

**COURSE CONTENT**

- Insights into becoming a successful coach
- The context for wellsite coaching
- Fundamental wellsite coaching skills
- Using different coaching styles
- Practical applications of coaching to enhance performance
- Using a combination of 4 learning styles for knowledge transfer
- Developing a holistic approach using the GROW methodology
- Practical scenario situations to practice skills
- Dealing with difficult people
- Developing an assertive approach
- Cognitive behavioral coaching and enabling and limiting beliefs
- The practical wellsite coaching action plan

**AUDIENCE**

Offshore installation managers, senior tool pushers, maintenance supervisors, and barge engineers

**PREREQUISITE**

Five years of professional experience

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**Transforming Teams Workshop**

**Skill – 2 Days**

Participants will explore their individual role in team transformation with the aim of increasing both personal accountability and team productivity. The course will also address how emerging and current leaders can foster a more respectful and effective team performance in an environment. This workshop introduces Patrick Lencioni’s concept of high-functioning teams, including team assessments, where it is deemed appropriate.

**COURSE CONTENT**

- Team development
- Strategies to build team trust and accountability
- Stages of team development
- Personality type and impact on team performance
- Strengths Finder Profile and Belbin Team Role preference
- Delegation for optimal team performance
- Indicators of type preferences and the benefits of differences
- Implications of individual preferences on team relationships
- Team effectiveness
- Causes of poor communication and conflict among team members
- Strategies that will assist in enhancing a team’s effectiveness and interpersonal relationships
- Building team effectiveness and goal achievement
- Optimizing different personal preferences

**AUDIENCE**

Managers and professionals who want to improve their business presentation skills

**PREREQUISITE**

None

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**High Impact Presentation Skills**

**Skill – 3 Days**

Strong presentation and influencing skills can have a significant impact on achieving business goals. This course will provide participants with a structured set of skills that will enable each to effectively communicate in the business environment and deliver successful business presentations. This course will also aim to improve their persuasion and influencing skills, as well as identify opportunities for personal development. More than half the course is dedicated to realistic exercises, with coaching, practice, and feedback provided to further develop skills and build confidence.

**COURSE CONTENT**

- Presentation planning and preparation
- Understanding communication
- How to plan a presentation
- How to prepare for a presentation
- Presentation practice
- The importance of practice
- How to handle questions
- How to manage the presentation
- Presentation delivery
- Keys to delivering a presentation
- Common problems and solutions
- Class presentation and feedback

**AUDIENCE**

Managers and professionals who want to improve their business presentation skills

**PREREQUISITE**

None

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**Mindful Leadership Workshop - Advanced**

**Skill – 2 Days**

Learning and practicing mindful awareness has been shown to decrease symptoms of stress, build confidence, and improve energy and enthusiasm. It has also been shown to assist leaders in facing the inevitable uncertainty and complexity of their role with a rational and calm thought process. This ability for calm under pressure in the midst of chaos is the hallmark of an influential and inspirational leader. This workshop build on the introductory Mindful Leadership workshop, in which participants began the process of self-awareness leading to a personal leadership vision. In the advanced workshop, participants will further explore how their reactions, emotions, thoughts, and beliefs positively or negatively influence their work, relationships with colleagues, and work environment.

**COURSE CONTENT**

- Mindful leadership and emotional intelligence
- How have participants been using the strategies to improve their leadership practice?
- What were some of the challenges and successes?
- Personal spheres of influence
- Power and leadership
- Leadership style and situational analysis
- Personal leadership vision
- Detrimental patterns
- Effective emotional responses for effective leadership
- Personal leadership values
- Leadership vision

AUDIENCE
Frontline and senior leaders who wish to develop their emotional intelligence and awareness to be more effective leaders

PREREQUISITE
Mindful Leadership Workshop—Introduction

Powerful Technical Presentations
Skill – 3 Days

How many times have professionals worried that their inability to make a polished technical presentation has hurt their professional reputation? The Harvard Business Review listed “effectively speaking in public” as the number one criterion for career advancement. This course will feature the use of video recordings of participants’ presentations with instructor feedback and recommendations for improvement. In the mind of an audience, the ability to speak effectively will reflect the professional’s ability to think logically, is an indication of status and education, and summarizes competence. This training course will help participants develop their speaking ability through refining the content, polishing verbal skills, improving body language skills, and channeling nervous energy.

COURSE CONTENT
- Preparation
- Developing the content for a technical presentation
- Understanding the three parts to all presentations
- Four rules for communication and how they apply to presentations
- Presentation #1
- Delivery skills
- Presentation #2
- Verbal skills in technical presentations
- Nonverbal skills during technical presentations
- Handling nervousness effectively
- Appropriate use of humor and stories
- Presentation #3
- Visual aids
- Creating visual aids to enhance the technical presentation
- Guidelines for using visual aids during the presentation
- Practicing with visual aids
- Handling questions and objections during a technical presentation
- Using the model for team presentations
- Other logistics and considerations
- Final Presentation

AUDIENCE
Technical professionals who want to develop and deliver more compelling and powerful presentations

PREREQUISITE
None

Performance, Coaching, and Counseling
Skill – 4 Days

Leaders attain optimal performance from their employees when performance expectations are clear and adequate coaching is provided. This workshop will provide participants with a number of tools and strategies to foster a positive and respectful environment that will allow optimal performance. It will aim to build capacity and inspire confidence in supervisors, enabling them to become capable of implementing a number of performance management (PM) strategies for bringing out the best in their employees. It will also provide information on different performance feedback strategies and address strategies for engaging in authentic dialogue, clear dialogue, and active listening, which are critical components of performance management and effective coaching. Participants will also be introduced to the GROW and other best-practice coaching models.

COURSE CONTENT
- Performance Management (PM)
- Critical components and cycle
- PM as a mechanism to foster a respectful and positive working environment
- Link between accountability for performance expectations and outcomes
- Effective PM and empowerment
- Performance expectations through SMART goal setting
- Appropriate performance feedback strategies
- Applying metrics to assess and measure performance
- Barriers and contributors to optimal performance
- Identify solutions to address performance deficiencies
- Options for recognizing above-average performance
- Counseling performance deficiencies versus coaching
- Coaching and counseling
- Coaching models and coaching strategies
- GROW and other PM models
- Conducting optimal performance discussions and coaching discussions
- Corrective action versus motivating optimal performance
- Effective peer collaboration
- Peer-to-peer coaching strategies

AUDIENCE
Emerging and frontline leaders or any leader wanting to improve competency of coaching and performance management

PREREQUISITE
None

Influential Conversations
Skill – 1 Day

This workshop will teach tactics to discover who a person is and how they show up in the workplace. People with influence are genuinely interested in other people. They will behave respectfully toward everyone and have the ability to get others involved. They also seem genuine, and people just cannot help but like them. They are able to gain trust quickly and build a relationship based on that trust. This workshop will help leaders build the type of influence that matters.

COURSE CONTENT
- Influential conversations
- How to map networks of influence and identify key points of leverage
- Four approaches to initiating change in others

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• A structure for conducting an influential conversation
• The role of likability in influence and how to be more likable
• How to plan an influential conversation

**AUDIENCE**
Leaders who want to have greater influence with clients, colleagues, subordinates, and senior management

**PREREQUISITE**
None

### Managing Teams for Success

**Skill – 4 Days**

In this 4-Day class, leaders will be taught how to plan, develop, and align their teams for success. Topics covered include how to establish a supportive interview atmosphere in which candidates share information readily. Behavioral interviewing techniques will be taught. Participants will also learn how to coach in order to inspire achievement, inspire victory, and garner respect. In this session, participants will learn essential coaching skills to improve day-to-day and long-term performance. They will learn how to be demanding of those they lead in the correct way. This course focuses on the role of the leader in aligning people versus simply organizing and staffing business units. The session deals with communicating the vision to people in ways that increase their commitment to it. Interdependence and its needs will be explored in the context of work, hierarchy, and technology.

**COURSE CONTENT**

• Selecting the right people
• Competencies in a job
• Asking the right questions
• Qualifying candidates
• Coaching and counseling for performance
• A model for coaching
• Coaching techniques and tips
• Performance feedback model
• Influencing through negotiation
• Basic techniques of negotiation
• The art of win-win collaboration
• Managing teams
• Effective team components
• Team communication styles
• Team management model

**AUDIENCE**
Supervisors, managers, project managers, and team leaders involved in managing, leading, and developing people

**PREREQUISITE**
None

### Negotiation Skills for the Oil and Gas Industry

**Skill – 5 Days**

During this course, participants will learn how to apply a structured approach to effective negotiating. Combining this with the practice sessions incorporated into the program, this course is designed to improve participants’ confidence in and outcomes of their negotiations. Attendees will be exposed to the Breakthrough Negotiation strategy to help them achieve results in difficult and complex negotiations. The bulk of this interactive course consists of role-playing scenarios based on a variety of commercial and noncommercial situations. This is underpinned with instruction in negotiating principles and methodology, as well as essential checklists for planning and reviewing.

**COURSE CONTENT**

• Negotiation process
• Preparing for negotiation
• Initiating and presentation
• Role play: 1 to 1 negotiation
• Effective verbal and nonverbal communication
• Handling international negotiations
• Recognizing cultural differences
• Overview of bargaining and presentation stages
• Role play: 1 to 1 negotiation
• Bargaining
• Closing the deal
• Team negotiations
• Role play: team negotiations
• To the balcony: keeping your eye on the prize
• Disarm them: stepping to their side
• Change the game: reframing
• Building the golden bridge
• Bringing them to their senses, not to their knees
• Role play: team negotiations
• Virtual international negotiations
• Managing conflict
• Contract disputes
• Habits of successful negotiators
• Role play: team negotiations

**AUDIENCE**
Those with little or no previous negotiating experience who wish to improve their ability and confidence

**PREREQUISITE**
None

### Managing Performance and Appraisal Reviews

**Skill – 3 Days**

This 3-Day course is designed and developed to provide understanding of the overall performance management process. Participants will learn how to conduct a meaningful performance review (appraisal). They will learn how to correctly set and write meaningful objectives, as well as how to cascade objectives through their department or organization. The course will teach participants how to give effective feedback and follow through with identifying the correct development for the individuals from the review. Each day will consist of exercises, role playing, and examples with constructive feedback from the instructor to ensure that the learning goals are being met. By the end of the course, attendees will have gained the knowledge, confidence, and skills to manage performance in their organizations.

**COURSE CONTENT**

• Organizational development and human resource development
• Performance management overview and definition
• Strategy, policy process, and formation
• Review of systems, processes, and models (business and appraisal)
• Review of online and paper-based systems
• Linking performance and talent/high-potential development
• Converting/cascading business objectives to personal performance objectives
• Format of personal performance review (appraisal) documents
• Behaviors and factors affecting good performance (appraisal) reviews
• Motivation: theories and ideals
• The four performance management problem factors
• Ensuring objectives are contextualized
• Setting and writing objectives: SMART
• Interpersonal skills in conducting the review
• Conducting the three stages of personal performance (appraisal) reviews
• Reviewing the review and development options
• Development: alignment with objectives and expectations
• Development planning
• GAP analysis: linking in with operational and talent/high-potential strategies
• Follow-up and interim reviews
• Appeal procedures
• Review and feedback

AUDIENCE
Managers who undertake appraisals or performance management reviews or who manage individual performance in an organization; human resource managers and practitioners

PREREQUISITE
None

Feedback Conversations
Skill – 1 Day

Feedback conversations are critical to the health of organizations, and yet conducting these types of interactions is one of the most challenging aspects of leadership. Few leaders do it well, and some hardly do it at all. In most organizations, there is an urgent need for more feedback: feedback that recognizes excellence, builds on potential, and addresses lack of performance. This 1-day program will explore the full range of feedback conversations, including those with positive, corrective, and developmental focuses.

COURSE CONTENT
• Feedback conversations
• Three types of feedback conversations
• Integrating corrective or developmental feedback into a leadership conversation
• Handling defensive reactions
• Receiving difficult feedback
• Self-assessment

AUDIENCE
Managers and professionals working in an international and/or multicultural environment who want to improve their business communication and influencing skills

PREREQUISITE
None

Talent Management and Retention in the Oil and Gas Industry
Skill – 3 Days

Talent can mean the difference between ordinary and excellent. This course was developed to give participants the necessary information, understanding, and techniques to actively identify, develop, and retain talent within an organization. Attendees will learn about talent management processes, systems, and procedures. They will gain insight into talent identification methods, grading structures, competency and behavioral frameworks, and the use of psychometric
tools. Having identified the talent or high potential, participants will learn about development options, ensuring the effective focus of talent in the organization. In addition, they will learn to understand and develop succession plans to ensure positive career paths and development for talented and high-potential employees, also securing sustained growth of the organization.

**COURSE OFFERINGS**

*IMMERSIVE LEARNING PROGRAMS*

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical courses that use software</td>
<td>Includes practical sessions Uses simulation Field trips</td>
</tr>
</tbody>
</table>

**Compentency Management**

**AUDIENCE**

Managers, directors, and human resources professionals who manage or have a vested interest in managing talent within their organization

**PREREQUISITE**

None

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**Becoming an Inspirational Leader in Oil and Gas**

*Advanced – 3 Days*

How can managers improve the quality of leadership in their business? How do managers inspire others? Why do others want to follow managers, and what makes them go the extra mile? The best leaders promote a culture in which people value themselves, each other, their organization, and the customers. Everyone understands how their work makes a difference, and this helps to build a commitment to higher standards and makes people want to do better. Inspirational leadership is not a gift of nature. It requires awareness and practice. This course will help managers identify the inspirational leader that is inside them.

**Course Content**

- The context for inspirational leadership in a VUCA world
- The dimensions of an inspirational leader and characteristics
- Understanding behavioral styles
- Using values and motivation to inspire
- The application of emotional intelligence to inspirational leadership
- Creating a vision that inspires and aligns others
- Inspiring in times of organizational change
- Using 8 steps to set up and manage successfully a change project

**AUDIENCE**

Executive management, supervisors, operations managers, project managers, team leaders, personnel

**PREREQUISITE**

5 years of professional experience.

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**Leading Organizational Change in Oil and Gas**

*Advanced – 3 Days*

The oil and gas sector is becoming increasingly important for organizations. In order for organizations to gain and sustain a competitive advantage, they must be able to proactively manage the changes needed to enable strategic initiatives. This course will equip participants with the understanding, tools, and techniques needed to successfully navigate change within an organization.

**Course Content**

- Elements of organizational change
- Assessing the capacity for organizational change
- The 8-step change approach by Kotter
- Application of the organizational change process
- Executing strategic organizational change
- Using the ADKAR approach to achieve flawless execution
- Practical application using a case study
- Building a strong business case for change
- Stakeholder management in the change process
- Mapping and influencing stakeholders
- Developing an impactful communications plan
- Overcoming resistance and getting buy-in to changes

**AUDIENCE**

Executive management, supervisors, operations managers, project managers, team leaders, personnel

**PREREQUISITE**

5 years of professional experience.
Business and Project Management

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked ☮️ while technical courses that use software have been marked 📡, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 🤖. There are some courses that use simulators and are highlighted with 🛋️.

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>BUSINESS STRATEGY</th>
<th>PROJECT MANAGEMENT</th>
<th>CONTRACTS AND PROCUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADVANCED</strong></td>
<td>A Strategic Approach to Oil and Gas Exploration</td>
<td>Strategic Project Management</td>
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<tr>
<td></td>
<td>Portfolio Management ☮️</td>
<td>Project Risk Analysis and Management</td>
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<tr>
<td><strong>SKILL</strong></td>
<td>International Management Skills</td>
<td>Successful Project Recovery</td>
<td>Technical Bidding and Tendering</td>
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<td></td>
<td>International Oil and Gas Exploitation Contracts</td>
<td>Applied Project Management - Oil and Gas</td>
<td>Contracts, Procurements, and Partnering</td>
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<tr>
<td></td>
<td>Petroleum Geopolitics with OilSim 📡</td>
<td>Deepwater Well Project and Risk Management</td>
<td>Supply Chain Strategy</td>
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<td></td>
<td>Negotiation Skills for the Oil and Gas Industry 🛋️</td>
<td>Risk Management for Projects</td>
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<td>Advanced Cost Estimating and Control</td>
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<td>Ultimate PMP® Prep Boot Camp</td>
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<tr>
<td><strong>FOUNDATION</strong></td>
<td>Introduction to Management of E&amp;P Business with OilSim ☮️</td>
<td>Practical Project Management in Spanish or Portuguese</td>
<td>Document Management for Oil and Gas Professionals</td>
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<td>Fundamentals of IT Infrastructure for G&amp;G and RE Applications</td>
<td>Project Management</td>
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<tr>
<td></td>
<td>Navigational Playbook and Strategic Planning Workshop 📡</td>
<td>Project Management Fundamentals</td>
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<tr>
<td></td>
<td>Introduction to Information Management in the Petroleum Industry</td>
<td>Communication and Presentation Skills for Project Managers</td>
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<tr>
<td><strong>AWARENESS</strong></td>
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<td>Microsoft Project 2013</td>
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<td>Project Management for Managers</td>
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Business and Project Management

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<td>Project Management</td>
<td>COMPETENCY LEVEL</td>
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<tr>
<td>Project Management Awareness (Virtual Instructor)</td>
<td>AWARENESS</td>
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<td></td>
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<tr>
<td>Project Management for Team Members (Virtual instructor)</td>
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</tbody>
</table>

Software: Technical courses that use software
Includes practical sessions: Field trips: Uses simulation
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

Project Management for Team Members

Awareness – 2 Days

This 2-Day course provides the basic knowledge and skills required to successfully participate in an oil and gas project. This awareness course is designed to provide attendees with an introduction to the concepts of project management. As such, this course will provide a good basis for any person seeking future career advancement as a team lead or project manager. It will also establish a common language, thus facilitating moves across segments or departments. The case studies for applying the project management methodology will use oil and gas examples and can be tailored (for an additional fee) to the specific needs of a customer. It will start with correctly defining the project, including scope and requirements, and then progress to planning, implementing the plan, and finally, closing out the project. The course follows the guidelines established by the Project Management Institute and its Project Management Body of Knowledge (PMBOK® Guide), 5th edition. Although this is an awareness-level course, it does qualify for 16 PDUs.

COURSE CONTENT

• Project management overview, initiation, and planning
• Common terminology
• Project management life cycle
• Team member responsibilities in planning a project
• Scope definition and team member duties
• Project execution: managing scope, budget, schedule, and risks
• Importance of managing work during a project
• Risk management and its importance to the successful completion of a project
• Project execution and change control
• Closing processes and lessons learned

AUDIENCE

Anyone who desires an increased understanding of how to participate successfully in a project

PREREQUISITE

None

Project Management for Managers

Awareness – 1 Day

This 1-Day course provides the common language and tools to enable functional and departmental managers to coach, guide, and direct project managers and teams. Participants will receive practical, hands-on project management tools and techniques. This will include real-world project examples and exercises. This course will focus on situational awareness necessary to effectively lead and manage projects. Participants will learn the ability to manage a project by getting it right the first time through effective planning and scoping. They will learn what it takes to make a project succeed (or fail), discover how to start a project with the end in mind, learn how to get to know the stakeholders, determine how to plan and mitigate project risk, and decide how to track status and understand the situation.

COURSE CONTENT

• Project management for managers
• Phases of a project
• Critical success factors
• Tools and techniques

AUDIENCE

Functional and departmental leaders involved in project delivery or managing project managers; supervisors, managers, and project sponsors

PREREQUISITE

None

Microsoft Project 2013

Foundation – 3 Days

This 3-Day course will demonstrate that Microsoft Project is designed to align with all the essential elements of a structured project. Microsoft Project software was built as a tool for project managers and covers nearly all aspects of the Project Management Body of Knowledge (PMBOK® Guide) from the Project Management Institute. The course will include exercises and case studies for application of the concepts.

COURSE CONTENT

• MS Project basics
• Introduction to MS Project
• Navigation in MS Project
• Entering scope in MS Project, including work breakdown structure, dependencies, and linking of tasks
• Time management
• Entering time and creating the Gantt chart
• Entering and managing resources
• Using an industry-based case study to apply the skills
• Cost management
• Entering costs, including the resource sheet, fixed costs, variable costs, and materials costs
• Baselining and tracking a project in MS Project, including calculating earned value
• Using an industry-based case study to apply the skills

AUDIENCE

Students who wish to know the basic goals and approach of Microsoft Project 2010 in managing oil and gas projects

PREREQUISITE

An understanding of the fundamentals of project management; a laptop

Introduction to Information Management in the Petroleum Industry

Foundation – 3 Days

This course introduces the principles of Information Management applied to the Petroleum Industry. Using class lectures and practical activities, participants will gain the opportunity to realize the business value of data management and its impact through the Oilfield Life cycle coning or behind pipe.

COURSE CONTENT

• Business Value
• Data
• Information
• Knowledge
• Wisdom
• Oilfield Life Cycle
• Data Types and Categories
• Structured and Unstructured
• Data Life Cycle
• Quality
• Security

Visit NExTraining.com/classes for the latest calendar or to register for a course.
• Project Vs. Corporate Vs. Operational
• Context and Organization
• Process
• Organization and Definitions
• Policies and Procedures
• Standards
• Methodologies
• Ownership
• Risks and Mitigations
• Decisions
• Legal Obligations
• Architecture
• Development
• Infrastructure
• Service Management

AUDIENCE
Professionals that participate in Petroleum Data Management related functions, those with domain experience, technical data management from other industries (aerospace, defense, medical, finance), and corporate executives with budgeting responsibilities in E&P data handling

PREREQUISITE
General understanding of the Petroleum Exploration and Production business and/or awareness of technical data handling

Communication and Presentation Skills for Project Managers
Foundation – 5 Days
During this 5-Day course, participants will learn the proper communication and presentation skills for an individual who is moving into a project manager role. This will include preparing leadership for their role using communications. The course will also cover writing a project charter, writing a case for change, and writing a report. Participants will learn how to properly prepare presentations depending on their audience (executives, managers, users, or stakeholders). Throughout this course, participants will learn what business project management is and why being a good project manager is not enough. They will also learn why project communication is so important and what happens if project communication is ignored.

COURSE CONTENT
• Linking projects to the business
• Understanding the business context for the project
• Recognizing the common elements for all communications
• Writing the charter as a communication tool
• Writing the case for change as a communication tool
• Building the communication plan
• Doing a stakeholder analysis as a basis for the communication plan
• Communicating changes in work processes
• Using communication to handle risks
• Communicating about problems effectively
• Other communication requirements
• Communicating scope changes

• Using communication to prepare operations for the project deliverables
• Handling competition with other initiatives using communication
• Writing a closeout report
• Presentations as part of a communication plan
• Developing the content of the presentation
• Choosing a strategy for the presentation
• Developing polished delivery skills for presentations
• Guidelines for using visual aids in presentations
• Communications to management
• Understanding the context of communication with management
• Understanding the politics in communication with management
• Communication with your sponsor on problems
• Internal and external communications

AUDIENCE
Project managers with at least one year’s experience in managing projects; team leaders moving into a project manager role

PREREQUISITE
Basic knowledge of the fundamentals of project management

Navigational Playbook and Strategic Planning Workshop
Foundation – 1 Day
This 1-Day workshop is an opportunity for leaders at any level to define (or redefine) their business unit game plan. Participants will take a vested interest in the corporate culture and apply it to their role. Through skills and knowledge developed in this workshop, participants will learn how to link corporate strategy to their roles and/or business units in a written game plan. Participants will be guided through 8 leadership tools to enable systematic development of what is needed and wanted most in their business.

COURSE CONTENT
• Vision, mission, and values
• Organizational chart/influence chart
• Workflow, expectations, key performance indicators
• Coaching notes

AUDIENCE
Anyone in a leadership role

PREREQUISITE
None

Project Management Fundamentals
Foundation – 5 Days
The practical application of standard project management methodology will be enhanced with a workshop approach, the use of participant case studies for practical exercises, and a project simulation. This course will follow the guidelines established by the Project Management Institute (PMI) and its Project Management Body of Knowledge (PMBOK® Guide), 5th edition. The course provides attendees with the ability to apply project management best practices in initiating, planning, executing, and closing a project. During the workshop, participants will develop a project charter, perform a stakeholder analysis and use it in developing a communication plan, develop a work breakdown structure, and conduct a risk analysis. Additionally, participants will learn effective techniques for monitoring and controlling a project, as well as how to capture project lessons learned. This
course satisfies the Project Management Professional (PMP)® certification 35-hour training requirement.

**COURSE CONTENT**
- Project management overview and project initiation
- Project management and the project life cycle
- Initiating a project
- Developing a project charter
- Identifying and establishing a project governance
- Project planning
- Stakeholder analysis and communication planning
- Scope definition
- Develop a work breakdown structure
- Determining critical path and float
- Project planning and project execution
- Planning for quality
- Procurement planning
- Project risk analysis
- Project change control
- Project execution simulation and project monitor/control
- Project simulation game
- Project monitor/control and project closing
- EVA analysis
- Project quality reviews
- Closing processes and conducting lessons learned
- Organizational change management

**AUDIENCE**
Project managers who desire an increased understanding of how to successfully manage a project based on the PMI project management methodology

**PREREQUISITE**
None

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**Fundamentals of IT Infrastructure for G&G and RE Applications**

**Foundation – 3 Days**

This course will cover the technical factors that should be considered when defining E&P IT infrastructure.

**COURSE CONTENT**
- E&P IT Overview
- IT for G&G applications
- IT for RE applications
- IT for Data Management
- The Integrated IT environment for E&P

**AUDIENCE**
IT Support, IT Managers with previous experience in supporting corporate IT infrastructure

**PREREQUISITE**
None

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**Project Management**

**Foundation – 5 Days**

This intensive 5-Day course provides an in-depth and comprehensive coverage of the key skills and knowledge required for effective project management as detailed in the Project Management Institute’s Project Management Body of Knowledge (PMBOK® Guide), 5th edition. This will be delivered through a combination of facilitated lectures, practical exercises, and interactive sessions in which participants can raise their own concerns and contribute their own experiences from working on projects. Real-world examples will be used to illustrate problems that may be faced in the working environment. The topics, disciplines, and enabling skills will be progressively built upon and linked to the development of case studies worked on in a team environment to further participants’ personal skills. This course satisfies the Project Management Professional (PMP)® certification 35-hour training requirement.

**COURSE CONTENT**
- Introduction to project management, communication, and stakeholder management
- Communication
- Stakeholder management
- Integration, scope, and time management
- Integration management
- Scope management
- Time management
- Cost, risk, and team roles
- Cost management
- Risk management
- Time management
- Teams, leadership, and aligning and partnering
- Team building
- Team leadership
- Aligning and partnering
- Procurement, quality, and negotiating
- Procurement
- Quality management
- Negotiation

**AUDIENCE**
Project engineers, supervisors, lead consultants, project supervisors, and leaders who wish to increase their knowledge of the management of projects; professionals who wish to pursue the PMP examination and improve their project performance

**PREREQUISITE**
None
**Introduction to Management of E&P Business with OilSim**  
*Foundation – 5 Days*

This course will provide participants with the knowledge and understanding of the entire oil company decision-making process from initial new country entry strategy through field abandonment. It will cover the technical and business challenges, as well as the interactions with fiscal and government bodies. This course will include the decision making process in various aspects from exploration to production, as well as typical business and economics framework of oil companies.

**COURSE CONTENT**
- Macro-economics and corporate strategic responses
- Three tests of strategy
- Internal and external factors impacting the value of assets
- Fiscal regimes
- Simulated Challenge 1: Finding Blocks
- Petroleum systems
- Geophysical methods
- Exploration as a process and successful exploration strategies
- Petroleum economics
- Simulated Challenge 2: Prospecting
- Drilling
- Reserves classification
- Reservoir appraisal
- Field development
- Simulated Challenge 4: Depletion Plan
- Facilities
- Simulated Challenge 5: Facilities Plan
- Construction and project management
- Simulated Challenge 6: Construction Project
- Production
- Simulated Challenge 7: Production Operations
- Maximizing value
- Abandonment

**AUDIENCE**
Anyone who desires an increased understanding of the management of upstream oil and gas assets.

**PREREQUISITE**
None

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**Document Management for Oil and Gas Professionals**  
*Foundation – 4 Days*

Document management can be the critical factor determining success or failure of a company initiative. This workshop is designed to help oil and gas company staff understand the issues and challenges faced by data and document managers in this sector. With time-proven methodologies and techniques, the course facilitator will help attendees understand and implement key document management tools. Participants will be introduced to the use of data quality control, quality assurance, and audit procedures. The course also highlights the different types of risks facing the oil and gas sector and provide guidance on disaster recovery and business continuity planning. This workshop introduces a number of new tools and techniques that could form the basis of a document management strategy. It also provides case histories and access to the experience of one of the leading experts in this field.

**COURSE CONTENT**
- Data and documents in the oil and gas sector
- Physical and electronic information management

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**Practical Project Management in Spanish or Portuguese**  
*Foundation – 5 Days*

This course will provide participants with the fundamental knowledge and skills required to successfully manage an oil and gas project. The case studies for applying the project management methodology will use oil and gas examples and can be tailored (for an additional fee) to the specific needs of a customer. This course will start by correctly defining the project, including scope and requirements, and then go through planning, implementing the plan, and finally, closing out the project. The course will follow the guidelines established by the Project Management Institute and its Project Management Body of Knowledge (PMBOK® Guide). To ensure attendees absorb both the theory and the practical application of the topics, this course uses a combination of instructor-led sessions, group discussions, exercises and templates, and practice application of project management software. This course satisfies the Project Management Professional (PMP®) certification 35-hour training requirement.

**COURSE CONTENT**
- Initiating a project
- Common terminology
- Developing a project charter
- Introduction of the case studies
- Planning processes for project management
- Scope definition
- Work breakdown structure
- Critical Path
- Dealing with people
- Building the project team
- Risk analysis
- Planning for quality
- Communication plan
- Executing the project plan
- Change control
- Monitoring and control
- Managing change
- Closing processes
- Lessons learned
- Review of the key course concepts
- Preparing for the PMP certification
- Growth opportunities in project management

**AUDIENCE**
Anyone who desires an increased understanding of how to run a successful project

**PREREQUISITE**
None
COURSE OFFERINGS

- Benefits of good information management
- Document and records management
- Classification schemes and file plans
- Vital records and business continuity
- Storage options
- Introduction to data quality
- Case histories and new technologies
- The 8-point action plan
- Disaster prevention and recovery
- Information governance
- Quality, accountability, and compliance
- Social computing and e-collaboration tools
- Developments in knowledge management
- Knowledge audits
- Knowledge exchange
- Peer reviews
- Benefits analysis
- Cashable, noncashable, tangible, and tacit benefits
- The principles of information management
- Change management

AUDIENCE
Anyone who manages or is involved with any aspect of data and document management/document control within an oil and gas company or support organization

PREREQUISITE
None

Ultimate PMP® Prep Boot Camp

Skill – 5 Days

This course will provide the knowledge and skills required to successfully pass the Project Management Institute (PMI) Project Management Professional (PMP)® exam and to gain understanding of its nine knowledge areas of project management. Participants will also learn how to understand the interactions of the 42 process elements utilizing the five process groups of project management, plus other significant topics that will be covered on the PMP exam. All course materials are cross-referenced to the Project Management Body of Knowledge (PMBOK® Guide), which provides over 500 flash cards covering acronyms, glossary definitions, process element definitions, knowledge areas, and process groups and which provides sample exams, containing over 1,000 questions, to prepare the course participants for the PMP exam. This course qualifies for 35 PDUs.

COURSE CONTENT
- Project framework, life cycles, and process groups
- Develop project charter
- Identify stakeholders
- Scope management planning
- Time management
- Cost management planning
- Quality management planning
- Human resource management planning
- Communication management planning

IMMERSIVE LEARNING PROGRAMS

- Risk management planning
- Stakeholder management
- Procurement management planning
- Project execution process elements
- Perform integrated change control
- Monitor and control project work
- Close the project and phase
- Professional and social responsibility
- Test preparation and test-taking techniques

AUDIENCE
Project managers who are interested in taking the PMI PMP exam.

PREREQUISITE
Prior completion of a basic project management course such as NExT Project Management Fundamentals or NExT Project Management; experience in PMI project management methodology; familiarity with the PMBOK® Guide

Advanced Cost Estimating and Control

Skill – 4 Days

This 4-Day seminar is designed for project managers with a minimum of three years’ experience who will be expected to lead high value O&G projects. The emphasis of this experiential course is on the practical application of proven project management best-practices, including the hands-on application of processes, tools and techniques to insure project success. Particular emphasis is given to students learning how to develop Cost and Schedule Management plans that address the development of realistic cost and schedule estimates, and how monitoring, controlling, re-planning and reporting will be accomplished throughout the project lifecycle.

COURSE CONTENT
- Key Challenges to O&G projects
- Project Management Processes
- Review of Project Planning Workshop Deliverables
- Integration of the project management lifecycle with O&G project phases
- Front End Loading (FEL) and its importance to O&G projects
- Project Execution Plan Elements
- Communications & Stakeholder Management
- Estimation Techniques
- Schedule and Schedule Execution Management
- Contractor Selection and Management
- Risk Management
- Quality Management
- Key concepts impacting cost control
- Earned Value
- Milestones, Performance Reporting, and Replanning
- Project Close

AUDIENCE
Project planners, project managers, line managers, project estimators

PREREQUISITE
PM Fundamentals or Equivalent

COMPE TENCY MANAGEMENT

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Negotiation Skills for the Oil and Gas Industry

Skill – 5 Days

During this course, participants will learn how to apply a structured approach to effective negotiating. Combining this with the practice sessions incorporated into the program, this course is designed to improve participants’ confidence in and outcomes of their negotiations. Attendees will be exposed to the Breakthrough Negotiation strategy to help them achieve results in difficult and complex negotiations. The bulk of this interactive course consists of role-playing scenarios based on a variety of commercial and noncommercial situations. This is underpinned with instruction in negotiating principles and methodology, as well as essential checklists for planning and reviewing.

**COURSE CONTENT**

- Negotiation process
- Preparing for negotiation
- Initiating and presentation
- Role play: 1 to 1 negotiation
- Effective verbal and nonverbal communication
- Handling international negotiations
- Recognizing cultural differences
- Overview of bargaining and presentation stages
- Role play: 1 to 1 negotiation
- Bargaining
- Closing the deal
- Team negotiations
- Role play: team negotiations
- To the balcony: keeping your eye on the prize
- Disarm them: stepping to their side
- Change the game: reframing
- Building the golden bridge
- Bringing them to their senses, not to their knees
- Role play: team negotiations
- Virtual international negotiations
- Managing conflict
- Contract disputes
- Habits of successful negotiators
- Role play: team negotiations

**AUDIENCE**

Those with little or no previous negotiating experience who wish to improve their ability and confidence

**PREREQUISITE**

None

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Risk Management for Projects

Skill – 2 Days

This 2-Day course focuses on risk management—one of the 10 knowledge areas of project management. Risk management focuses on dealing with the inevitable negative events that can occur on any project. Participants will learn determining methods to decrease the probability of those events or decrease the impact they will have on the project, or both. Participants will also learn about dealing with the potential opportunities. They will learn determining methods to either increase the probability of those events or increase the impact they will have on the project, or both.

**COURSE CONTENT**

- Foundation of risk management
- Project life cycle and risk management
- Identifying risks and the risk management process
- PMBOK® Guide and risk management
- Planning to manage risks and risk tolerance
- Analyzing the causes and effects of risks
- Qualitative and quantitative risk analysis
- Qualitative risk analysis and project stakeholders
- Probability and impact analysis matrix, including standard deviation curves
- Developing a decision tree
- Monte Carlo analysis and poor man’s Monte Carlo analysis
- Planning risk responses and monitoring risks during execution

**AUDIENCE**

Advanced project managers with at least one year of experience in managing projects

**PREREQUISITE**

A course in the fundamentals of project management

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Petroleum Geopolitics with OilSim

Skill – 5 Days

This 5-Day program explores the political elements in the process of oil and gas exploration licenses and continuous development of the oil industry. It gives the participants the tools to identify the players in the field, where to find relevant information and to analyze the relevant geopolitical situation for a given exploration bid or the long term strategy of a company, institution or organization.

**COURSE CONTENT**

- International relations overview
- Oilsim Challenge 1, 2 & political simulation - challenge 1
- International Organizations in the Energy Area
- Private and national oil companies
- Oilsim challenges 3-4 & political simulation - challenge 2
- National Oil & Energy Administrations
- Oilsim challenge 5-6 & political simulation - challenge 3
- The use of energy in international politics
- The use of energy in national politics
- Oil companies in international relations
- Political simulation – challenge 4-5
- Safety and Security in oil and gas production
- Understand the interaction between domestic and International politics
- Oil companies in international relations
- Political simulation – challenge 6-7
- The Global world

**AUDIENCE**

Professionals empowered with strategic planning, business development and investment responsibilities that need to understand the current geopolitical climate
Deepwater Well Project and Risk Management

**Skill – 5 Days**

The main goal of the course is to highlight the critical project and risk management issues required to run deepwater well projects in a safe, efficient, cost-effective, and environmentally friendly manner. At the end of the course, participants will understand the key issues and principles in deepwater project management. They will be able to apply the principles in practice and integrate them into the asset or project team to optimize the management of the well project and manage the identified risks to maximize value. Following the project management process from prospect evaluation through operations, participants will develop important skills needed to drill wells in a deepwater environment. The participants will understand the complexities of a deepwater drilling operation and will gain an understanding of issues that must be addressed when drilling deepwater wells.

**COURSE CONTENT**

- What is project management?
- Integrated management system and documentation
- Regulatory and HSE
- Hazards, probability, and risks
- Risk management
- The project plan
- Time and cost estimation
- Contracting
- Supply chain, logistics, and operations base
- Financial management
- Tracking progress
- Well planning
- Operations
- Contingency plans
- Risk management in action
- Human factors in deepwater well projects
- Teamwork
- Communications
- Decision making
- Managing change
- Reflections

**AUDIENCE**

Drilling managers, operations superintendents, senior well engineers, well engineers, and wellsite supervisors involved in deepwater well projects; general managers, asset managers, project managers, and others involved in the planning and management of deepwater drilling activities

**PREREQUISITE**

None

Supply Chain Strategy

**Skill – 5 Days**

Developing an effective procurement and supply chain management (SCM) strategy can make valuable quantifiable contributions to a company's performance. This course shows participants how to adopt a best-practice model and outlines the latest thinking in upstream petroleum industry procurement. Extensive use will be made of oil industry case studies, examples, and exercises, with participants working in syndicates to analyze problems and recommend solutions as they progress through the model. The emphasis will be on managing the supply chain in order to deliver maximum value at minimum cost, implementing a best-practice process, adopting innovative ways to select contractors, and preparing tender documents to manage contract risk.

**COURSE CONTENT**

- Best-practice procurement and SCM
- What is a contract?
- What is the supply chain, and how do we manage it?
- Developing a best-practice procurement process
- Contracts strategies
- What makes the petroleum industry different?
- What is a contracts strategy, and how do we develop one?
- The role of contracts policy and procedures
- Alternative contracts strategies
- Tendering precontract award
- How to carry out a contract risk assessment for strategy formulation and contractor selection
- Developing quality scopes of work (SDW): functional versus technical specifications
- How to choose an appropriate contract type and compensation method
- Preparing contractor selection criteria
- How to evaluate tender submissions to ensure best-value selection
- SCM postcontract award
- Understanding the small print of contractual language
- Terms and conditions
- How to manage the contract after it has been awarded
- Performance management and review
- How to apply a performance review process consistent with the SDW and the strategy
- Did the strategy work?
- Postcontract reviews, appraisal, and lessons learned
- Ethical considerations in SCM and contracting

**AUDIENCE**

Personnel of all levels and in all disciplines who have responsibility for, and involvement in, the entire procurement process

**PREREQUISITE**

None
International Oil and Gas Exploitation Contracts

Skill – 5 Days

During this course, participants will learn about the pitfalls and challenges faced during the contract negotiations for access to oil and gas resources. Using petroleum industry case studies and realistic examples, participants will receive a broad-based practical introduction to managing oil and gas exploration, along with development and production contracts. Participants will work individually and in teams to tackle a variety of industry challenges.

**COURSE CONTENT**

- Life cycle and estimating
- Overview of case study and options
- Financial appraisal review
- Scope management review
- Estimating review and accuracy
- Integrating planning and estimating
- Review network planning and scheduling
- Introduction to Microsoft Project
- Review resource management
- Integrated baseline reviews
- Risk analysis
- Review qualitative risk
- Qualitative contingency
- Review risk monitoring
- Introduction to quantitative risk analysis
- Overview of @Risk for Excel
- Risk analysis and controls
- Overview of @Risk for Project
- Overview of project controls
- Cash flow and cost control
- Project reviews
- Review stakeholder analysis
- Principles of project reviews
- Case study presentations

**AUDIENCE**

Professionals in various disciplines and nontechnical support staff

**PREREQUISITE**

Either have attended the foundation project management course, have attained the Project Management Professional (PMP®) certification, or have seven years of project management experience

Contracts, Procurements, and Partnering

Skill – 3 Days

Contracts must be managed on an ongoing basis. Most activities that are outsourced tend to be contracted for 3 to 5 years, with options to extend for further years, so it is vital that the promised results are delivered throughout the life of the contract. The objective of this course is to provide a comprehensive overview of the contractual environment necessary for project team members to interface effectively with the contract and procurement function as part of their day-to-day work. It is necessary to have an understanding of how a contract is formed, the key legal requirements underpinning a contract, and how a contract is administered. This course qualifies for 25.25 PDUs.

**COURSE CONTENT**

- The project and contracting context
- Alliancing and partnering
- The tender process
- The contract
- Contract structure
- Effective contract negotiation
- Supply chain management

Applied Project Management - Oil and Gas

Skill – 5 Days

This intensive 5-Day course will be about the application of project management techniques and knowledge for effectively estimating, planning, managing, and controlling a project. This course will extend to the identification, assessment, and control of qualitative risks in the project-based enterprise. Uncertainty will be inherent in all projects and particularly in the aspects of technical, financial, schedule, legal, and quality (the latter includes safety, health, environment, and facility integrity) of performance. In addition, this course will explore quantitative risk analysis using the basics of probability. The course will be delivered in a workshop style using a combination of review lectures and case studies focused on supporting the development of estimates, plans, and risk analysis of the case study project. This course qualifies for 45 PDUs.
- Contract administration
- Disputes

**AUDIENCE**
Anyone in a project team who requires a greater understanding of how contracts and procurement impact the project environment

**PREREQUISITE**
None

**International Management Skills**

**Skill – 5 Days**

Designed to improve international management skills, this course enables attendees to identify the competencies required for international managers and assess their own competence in personal effectiveness and relationship management. The attendees will learn to improve skills in critical areas such as motivation, cross-cultural communication, team management, delegation, coaching, conflict management, and change management.

**COURSE CONTENT**
- International management
- Using scenarios: Strength, weakness, opportunities, and threats analysis and specific, measurable, attainable, realistic, and timely goals and action planning
- Communication and influencing
- Situational team leadership
- Top 10 tips for team leaders
- Performance reviews
- Managing people through change
- International manager career development
- Planning for future self-development

**AUDIENCE**
Managers and professionals working in an international or multicultural environment.

**PREREQUISITE**
None

**Successful Project Recovery**

**Skill – 4 Days**

Sometimes, a project that is struggling requires a recovery manager with a specialized set of skills and techniques to successfully get the project back on track. The 5-step project recovery methodology and techniques presented in this course will give structure and guidance to the participants and will teach them how to rescue, turn around, and set a troubled project onto the right path for success. Participants will apply the techniques learned during a recovery workshop, where they will develop a high-level recovery plan presentation for executive management based on their class case study. This course qualifies for 30 PDUs.

**COURSE CONTENT**
- Introduction to project recovery methodology
- Step 1: realizing the problem
- Step 2: audit the project/advanced EVA
- Audit techniques: scope and people
- Audit techniques: governance, schedule, and technology
- Create audit report
- Step 3: analyze and replan root cause analysis
- Decision making
- Adjusting project management processes
- Create recovery plan
- Step 4: mediate the recovery plan preparation
- Negotiations
- Recovery workshop
- Workshop results
- Step 5: execute the recovery plan
- Project closeout and lessons learned

**AUDIENCE**
Experienced project managers, program managers, or recovery managers with at least 5 years of experience managing projects

**PREREQUISITE**
Project Management Professional (PMP)® certification or completion of a 35-hour PDU project management fundamentals course, such as Project Management Fundamentals or Project Management; key project documents of a current or previously troubled project participants have been involved with

**Technical Bidding and Tendering**

**Skill – 4 Days**

This 4-Day course covers the key aspects of technical bidding and tendering in project management. It will enable participants to deliver more effective bids and negotiate better contracts and claims. This course will also look at improving the contribution to the tendering and business development performance, as well as improving the management of bids in projects and business development. Participants will improve their presentations, communication, leadership skills, and competency. They will also learn to understand the contracting processes and appropriate strategies for application to specific project bid situations, as well as create, maintain, and enhance effective working relationships. This course qualifies for 30 PDUs.

**COURSE CONTENT**
- Tender review, planning, and clarifications
- Analyzing the specification
- Tender review decision
- Planning to win
- Client clarifications
- Case study
- Draft bid compilation
- Draft solution
- Estimating and pricing
- Risk assessment
- Tender strategy
- Case study draft bid compilation
- Quality, compliance, and contracts
- Blue team review
- Red team review
- Collaborative working
- Strategic review
- Bid compilation and presentation
The 4-Day course focuses on examining and applying qualitative and quantitative risk analysis techniques used in the best practice assessment of uncertainties in a project-based enterprise. Uncertainty is inherent in all projects and particularly in the aspects of technical, financial, schedule, legal, and quality performance. Project risk analysis is a body of expertise focused on the systematic and comprehensive analysis of the uncertainty in projects and project-based operations. This course qualifies for 30 PDUs.
COURSE OFFERINGS

• Strategy introduction
• Life cycles of organizations
• Exercise: strategic health check
• Oil industry landscape
• Exercise: review the competitive forces affecting the oil and gas industry
• Examples of strategic change
• Strategic reviews
• Creating a strategy
• What makes winning exploration strategies
• Exploration value chain and basin analysis
• Introduction to exploration history analysis
• Exercise: understanding basin creaming curves
• Nova Scotia offshore play fairway analysis
• Exploration workflow
• Portfolio management: managing exposure
• Exercise: portfolio analysis
• Organization (structure, quality assurance, HSE, licence to operate)
• People development
• Technology
• Exercise: assessing a company’s competitive position
• Monitoring and reviewing performance

AUDIENCE
Geologists, geophysicists, team leaders, and managers

PREREQUISITE
None

Advanced – 5 Days

This intensive 5-Day course covers all aspects of project management in greenfield and brownfield environments. It will combine a review of theory and practice of key skills in a program to develop and improve the participant’s performance in a project management team in which the work scope may include capital, operations, and maintenance projects. The workshop will include more detailed sessions on individual value improvement practices, depending on the solution to the case study that is developed by the teams. The stage gates will use simplified versions of decision support packages to assist teams in taking and winning decisions in the simulation of the capital value process. The workshop-style delivery will include review lectures to support the development of estimates, plans, and risk analysis of the case study project. The workshop will provide significant guidance to teams through the use of the project management best practice. This course qualifies for 45 PDUs.

COURSE CONTENT
• Project management, programs and other common terminology
• Project management life cycle
• Team member responsibilities in planning a project
• Scope definition and team member duties
• Importance of managing work during a project
• Risk management and its importance to the successful completion of a project
• Project execution and change control
• Closing processes and lessons learned

AUDIENCE
The course is aimed at anyone who desires an increased understanding of how to participate successfully in a project. Anyone who has minimal background in project management will find it useful.

PREREQUISITE
None

IMMERSIVE LEARNING PROGRAMS

• Quantitative risk analysis
• Overview of @Risk for Excel
• Overview of @Risk for Project
• Oriole case study 2: conceptual
• Value management
• Value improvement practices
• Constructability
• Sensitivity analysis
• Oriole case study 3: development action plan
• Procurement
• Best in class and benchmarking
• Quality
• Value improvement practices continued
• Integrated baseline reviews
• Oriole case study execution plan
• Case study preparation
• Presentation of case study
• Feedback from invited panel

AUDIENCE
Project managers who wish to gain exposure to more advanced project management techniques

PREREQUISITE
Prior knowledge of project management and ideally have attended the Project Management course

Project Management for Team Members (Virtual instructor)

Awareness – 2 Days

This 2-Day course will provide the basic knowledge and skills required to successfully participate in a project team. This awareness course is designed to provide attendees with an introduction to the concepts of Project Management via the “Project Management Body of Knowledge”. As such, this course provides a good basis for any person seeking future career advancement as a Team Lead or Project Manager. It also establishes a common language, thus facilitating moves across segments or departments.

COURSE CONTENT
• Project life cycle
• Project finance review
• Project execution plan
• Project realization
• Stage gate reviews
• Oriole case study 1: feasibility
• Decision support packages
• Qualitative risk review

AUDIENCE
The course is aimed at anyone who desires an increased understanding of how to participate successfully in a project. Anyone who has minimal background in project management will find it useful.

PREREQUISITE
None

COMPETENCY MANAGEMENT

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Project Management Awareness (Virtual Instructor)

Awareness – 4 Days

This 4-Day course will provide the basic knowledge and skills required to successfully participate in projects. It is designed to provide the attendees with and over all awareness and introduction to Project Management concepts. The course provides a good basis for any person seeking future career advancement as a Team Lead or with additional training a Project Manager. As a PMI Registered Education Provider (R.E.P.) the course follows the Project Management Body of Knowledge (PMBOK®).

COURSE CONTENT

- Project Management Overview & Project Initiation
- Defining projects, project management, programs and other common terminology
- Project management life cycle
- Project roles & responsibilities
- Project Planning
- Project Charter
- Project Execution Plan Overview
- Project Scope
- Project Planning & Project Execution (Monitoring & Control)
- Project Schedule
- Project Monitoring
- Risk Management
- Project Execution (Monitoring & Control) & Project Close
- Quality Management
- De-mobilizing projects
- Lessons Learned

AUDIENCE

Project team members who are seeking to take more project responsibilities as Team Leads or project coordinators.

PREREQUISITE

None
### Economics and Finance

NExT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline.

Field trips are marked ☑️ while technical courses that use software have been marked ☐ and the courses with practical sessions (either hands-on operational or software or both) are highlighted with ☐

There are some courses that use simulators and are highlighted with ☐.

#### DOMAIN  SOFTWARE  VIRTUAL CLASSROOM

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>Petroleum Economics</th>
<th>Risk and Uncertainty</th>
<th>Accounting and Finance</th>
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<tbody>
<tr>
<td><strong>ADVANCED</strong></td>
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<tr>
<th>Petroleum Economics - Heriot-Watt University Program</th>
<th>Introduction to Management of E&amp;P Business with OilSim</th>
<th>Exploration and Production Accounting - Level 1</th>
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<tr>
<td>Petroleum Economics</td>
<td>Petroleum Decision and Risk Analysis</td>
<td>Mastering Finance for Non-Financial Oil and Gas Personnel</td>
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<td>Petroleum Economics On-Line</td>
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## Economics and Finance

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked 💼 while technical courses that use software have been marked 🗺 and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 🍁. There are some courses that use simulators and are highlighted with 🌪.

### Course Matrix

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<th>Domain</th>
<th>Software</th>
<th>Virtual Classroom</th>
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<tbody>
<tr>
<td>Merak Capital Planning Fundamentals</td>
<td>GeoX Advanced Prospect Assessment (previously Advanced Risk and Resource Assessment)</td>
<td>Advanced</td>
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<tr>
<td>Merak Peep Software Development Kit (SDK) Using OLE Technology</td>
<td>GeoX Reserve Tracker (previously Resource Management Concepts and Application)</td>
<td>Skill</td>
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<tr>
<td>Merak Peep Software Development Kit (SDK)</td>
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<td>Merak Peep Fiscal Model Library Fundamentals</td>
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<td>Merak Decision Tool Kit</td>
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### Examples

- **Merak Capital Planning Fundamentals**
- **GeoX Advanced Prospect Assessment**
- **GeoX Reserve Tracker**
- **Merak Peep Software Development Kit (SDK) Using OLE Technology**
**Economics and Finance**

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with.

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<tr>
<td><strong>FOUNDATION</strong></td>
<td>Introduction to Economics of Unconventional Resources (Virtual Instructor)</td>
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</tr>
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</table>
Introduction to Petroleum Economics

**Awareness – 2 Days**

This blended-learning class is an excellent introduction for the attendees to the fundamentals of petroleum economics, including revenue, expenditures, fiscal systems, risk analysis, and investment analysis. The blended-learning experience includes questions and answers from learning materials, exercises, class discussions, team presentations, and an interactive challenge.

**COURSE CONTENT:**
- Cash flow basics
- Calculating revenue
- Estimating expenditures
- Fiscal systems
- Risk analysis
- Investment analysis
- Petroleum economics challenge (interactive exercise)

**AUDIENCE**
Nonfinancial professionals of all levels from technical and nontechnical backgrounds.

**PREREQUISITE**
None

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Petroleum Decision and Risk Analysis

**Foundation – 3 Days**

During this 3-Day course, participants will learn multiple approaches to modeling decisions for oil and gas projects. This course will also highlight a proven process and technology for decision analysis, which is used by companies worldwide. Participants will gain an overview of important concepts and examples of decision analysis. Uncertainties, risk, and the various ways to incorporate them into oil and gas project evaluations will be discussed throughout the course. A key concept that will be covered is the use of a proven decision analysis process, incorporating sensitivities, decision trees, and the value of information, in both deterministic and probabilistic approaches to evaluating oil and gas projects. This course uses Excel, as well as the Merak software Peep and Decision Tool Kit.

**COURSE CONTENT:**
- Concepts of decision and risk analysis, including decision criteria
- Decisions in the oil and gas industry
- Essentials of uncertainty, risk, probability, and statistics
- A proven process for decision analysis
- Modeling upstream oil and gas decisions
- Identify and incorporate key uncertainties
- Simple decision models
- Complex decision models with probabilistic analysis
- Case studies and practice problems
- Group problem challenge

**AUDIENCE**
Geoscientists, engineers, and commercial team members; anyone who wants to understand and model oil and gas decisions incorporating uncertainty and risk

**PREREQUISITE**
Foundation level course in petroleum economics, with some experience in project economics recommended.

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Petroleum Economics Online

**Foundation – 7 Hours**

This 7-unit course provides a solid foundation in the basic economic factors and concepts pertaining to decision making in the petroleum industry. The subject matter is presented using real-life scenarios and fictional characters that represent various players involved in the decision process. The course concludes with a module that challenges the participants’ understanding of the material presented. A simulated board of directors meeting is presented, and a decision must be made about the projects under consideration for development.

**COURSE CONTENT:**
- Cash flow basics, including revenue and expenditures
- Before-tax and after-tax cash flow
- Revenue, including production volume, scheduling, and decline
- Product prices, net profitability, and economic limits
- Expenditures, including capital and operating expenses
- Taxes
- Overview of fiscal systems, including different types of contracts
- Incorporating risk and uncertainty into economic evaluations
- Investment analysis, including the time value of money, economic indicators, and opportunity costs
- Simulated board meeting and project selection

**AUDIENCE**
Engineering technicians, production and drilling personnel, new hires, and supervisors with no prior economics experience

**PREREQUISITE**
None

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Mastering Finance for Non-Financial Oil and Gas Personnel

**Foundation – 2 Days**

This course, designed for personnel who do not have a financial background, presents the basic principles, theory, and practice of financial reporting and analysis as they apply to the oil and gas industry. Attendees will learn how to interpret, understand, and act on financial information as well as how to develop effective decision-making skills in addition to increasing your understanding of financial management elements that are specific to the oil and gas industry and key E&P accounting topics, including depreciation, reserves, decommissioning, and asset impairment tests.

**COURSE CONTENT:**
- Sources and uses of financial information
- Understanding financial information
- Cash flow and profit
- Measuring financial performance
- Accounting practices and policies
- Budget preparation and control
- Effects of taxation

**AUDIENCE**
Geoscientists, engineers, and commercial team members; anyone who wants to understand and model oil and gas decisions incorporating uncertainty and risk

**PREREQUISITE**
None
**Petroleum Economics**

**Foundation – 4 Days**

This 4-Day course is designed for learning the basics of petroleum economics and project selection. Several key concepts that will be covered are the time value of money, cash flow basics, common economic indicators, fiscal systems, and project selection fundamentals. An introduction to basic risk analysis will also be presented. Participants will receive an overview of petroleum economics, including an introduction to basic cash flow and net present value. The main types and elements of fiscal regimes around the world will be presented. During this course, participants will evaluate and make recommendations on potential oil and gas investments. This course uses Excel, along with the Merak software Peep and Decision Tool Kit.

**COURSE CONTENT**

- Project economics
- Methods of evaluation
- Project life cycle and who is involved
- Common types of oil and gas upstream projects
- Forecasting production, prices, and expenses
- Cash flow and economic indicators
- Defining revenue and operating expenses
- Capital expenditures
- Discounting and present value
- Economic indicators
- Fiscal regimes
- The main types and elements of fiscal regimes
- Cash flows for concessionary systems and production sharing contracts
- Service agreements
- Current trends in fiscal systems
- Project investment analysis
- Defining risk, sensitivity analysis, and calculating EMV and ENPV
- Incremental investment analysis
- Multiple project investment analysis, including project ranking
- The capital budgeting and project selection process

**AUDIENCE**

Anyone wanting a better understanding of finance and budgeting.

**PREREQUISITE**

None

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**Introduction to Management of E&P Business with OilSim**

**Foundation – 5 Days**

This 5-Day course will provide participants with the knowledge and understanding of the entire oil company decision-making process from initial new country entry strategy through field abandonment. It will cover the technical and business challenges, as well as the interactions with fiscal and government bodies. This course will include the decision making process in various aspects from exploration to production, as well as typical business and economics framework of oil companies.

**COURSE CONTENT**

- Macro-economics and corporate strategic responses
- Three tests of strategy
- Internal and external factors impacting the value of assets
- Fiscal regimes
- Simulated Challenge 1: Finding Blocks
- Petroleum systems
- Geophysical methods
- Exploration as a process and successful exploration strategies
- Petroleum economics
- Simulated Challenge 2: Prospecting
- Drilling
- Reserves classification
- Reservoir appraisal
- Simulated Challenge 3: Exploration and Appraisal Drilling
- Field development
- Simulated Challenge 4: Depletion Plan
- Facilities
- Simulated Challenge 5: Facilities Plan
- Construction and project management
- Simulated Challenge 6: Construction Project
- Audience
- Production
- Simulated Challenge 7: Production Operations
- Maximizing value
- Abandonment

**AUDIENCE**

Anyone requiring a fundamental knowledge of petroleum economics and oil and gas project recommendations.

**PREREQUISITE**

Intermediate knowledge of Excel

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A background, degree or experience in the geosciences, engineering or a financial area (finance, accounting, etc.) is preferred but not necessary.
Exploration and Production Accounting - Level 1

Foundation – 3 Days

This introductory-level course delivers a comprehensive overview of international accounting and finance practices in the E&P industry. It is particularly suitable for finance personnel who are new to the industry or those who want a broader understanding of oil and gas financial policy, joint ventures, and cost-control topics. Topics include industry accounting policies and practices; an introduction to managing project, development, and operating costs; the accounting and financial management implications of exploring for and producing oil and gas; and the background and accounting treatment of financial issues that are unique to the E&P industry.

**Course Content**
- How accounting policies influence financial performance reporting
- Successful efforts and full cost accounting
- Decommissioning costs
- Joint venture accounting
- Cost control and analysis
- Drilling cost control and forecasting
- Managing project and development costs

**Audience**
Finance staff new to the industry wanting a broader understanding of the oil and gas industry; staff being developed for broader accounting and financial management responsibilities; audit and information systems staff involved with financial controls and systems; and treasury and tax specialists.

**Prerequisite**
A basic knowledge of accounting and finance.

Economics of Petroleum Exploration

Skill – 5 Days

Participants will learn how to take hydrocarbon volumes and risks and apply a structured decision analysis process to them. The portfolio optimization process will also be discussed in order to help participants understand how to select the best exploration projects. The comparison of exploration projects under different fiscal regimes will be presented by incorporating discounted cash flow and net present value. The basics of decision analysis for exploration will be reviewed using sensitivities, decision trees, expected monetary value, and the value of information. This course uses Excel, along with the Merak software Peep, Decision Tool Kit, and Capital Planning.

**Course Content**
- The business of exploration
- Why companies explore
- The value chain in the E&P industry
- Justification for exploration
- How a company’s vision, mission, and strategy drive exploration
- Impact of worldwide fiscal regimes on exploration
- Overview of worldwide fiscal regimes
- Impact of fiscal regime on exploration
- Comparing projects under different fiscal regimes
- Project economics
- The role of project economics
- Calculating cash flow
- Economic indicators
- Net present value
- Decision analysis
- Sensitivity analysis
- Decision trees
- Expected monetary value
- Value of information
- Portfolio analysis
- Portfolio analysis
- Exploration strategies in portfolio management
- Bringing it all together, from play ranking to EMV

Petroleum Economics - Heriot-Watt University Program

Foundation – 5 Days

This 5-Day course is part of the Heriot-Watt University Distance Learning MSc Petroleum Engineering program. It is intended to give a broad understanding of the economic evaluation of petroleum projects. This course does not prescribe a particular method or process; it focuses on the ideas and principles that may become incorporated into corporate procedure. Petroleum investment is very long-term and subject to considerable risk. Some of these issues are identified and reviewed.

**Course Content**
- The economics of upstream petroleum
- One hundred fifty years of hydrocarbons
- Supply, demand, and control of the market
- Investment in the petroleum sector
- Evaluation methods
- Time value of money
- Undiscounted measures of value
- Discounted measure of value (e.g., NPV, IRR)
- Interpretation of measures
- Government: licensing and taxation
- Facilities risk

**Audience**
Individuals who seek to better understand the subject but are not registered for the degree course.

**Prerequisite**
None
### Risk, Uncertainty, and Decisions in E&P Projects

**Skill – 5 Days**

Understand why projects can fail due to adverse events with geologic, technical, commercial, or contractual origins. In this course, attendees will increase their understanding of how risk and uncertainty impact the decisions on which projects they select, how to develop them, and how these decisions affect their economic performance. Improving the quality of decisions is the main goal of this course; not just understanding risk and uncertainty for their own sake. Probabilistic concepts and tools are used to describe projects with risk and uncertainty to give a better understanding of the principles and tools underlying these concepts.

**COURSE CONTENT**
- Probability overview and simple exploration economics
- Dependencies
- Decision analysis
- Decision trees, Bayes formula, and the value of information
- Describing uncertainty
- Components of accuracy
- Monte Carlo analysis and its application
- Correlations and regressions

**AUDIENCE**
Anyone who needs an understanding of the economics of petroleum exploration.

**PREREQUISITE**
A basic knowledge of petroleum geology and petroleum systems

### Economics of Unconventional Resources

**Skill – 4 Days**

During this 4-Day course, participants will learn about the types of unconventional resources and the similarities among tight gas, coalbed methane, and shale gas. The life cycle and key parameters of unconventional plays will be discussed in order for participants to gain an understand of how to model the economic viability of a potential development. This modeling process will incorporate the benefits of the latest industry knowledge of unconventional resource development, such as sweet spot identification, well planning, drilling, and completions, in order to maximize the potential for profitability. Participants will gain an overview of worldwide unconventional activity, the ability to understand best practices for development, and the process for identifying key risks and uncertainties. In addition, a proven process for modeling the economics of unconventional resource development, including decision mapping and decision trees, will be covered. This course uses Excel, but primarily uses the Merak software Peep and Decision Tool Kit.

**COURSE CONTENT**
- Understanding the unconventional reservoir
- Life cycle of unconventional resources
- Overview of worldwide unconventional resources
- Case studies of North America development
- Development strategies
- Current practices in evaluation and development
- Key technical and business parameters
- Best practices for successful development
- Decision modeling
- Build decision map and decision model
- Understand major impacts on project viability
- Model type well
- Project cash flow and dynamic decision tree
- Understand breakeven price, hurdle rate, and other metrics
- Consider options for development and project modeling
- Project schedules and other parameters

**AUDIENCE**
Geoscientists, engineers, commercial team members, or managers who need to model and analyze the business impact of unconventional resources

**PREREQUISITE**
Working knowledge of project economics or a foundation level course in petroleum economics

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### Exploration and Production Accounting – Level 2

**Skill – 5 Days**

Increase your knowledge and understanding of international E&P finance and accounting to an intermediate level. An in-depth examination of international practices and current developments, this course covers a broad range of relevant topics. Attendees are encouraged to challenge existing methods as a basis for reviewing procedures and introducing improvements in your workplace.

**COURSE CONTENT**
- Regulation of oil and gas company accounting
- Impairment or ceiling tests
- Accounting disclosures, financing arrangements, sales revenue, and taxes
- International accounting standards
- State frameworks for control and exploitation of petroleum reserves
- Production-sharing contracts and their accounting practices
- Joint venture cash management, billing, and cost allocations

**AUDIENCE**
E&P accounting professionals wanting to gain advanced skills.

**PREREQUISITE**
Exploration and Production Accounting - Level 1.
International Oil and Gas Exploitation Contracts

Skill – 5 Days

During this course, participants will learn about the pitfalls and challenges faced during the contract negotiations for access to oil and gas resources. Using petroleum industry case studies and realistic examples, participants will receive a broad-based practical introduction to managing oil and gas exploration, along with development and production contracts. Participants will work individually and in teams to tackle a variety of industry challenges.

**COURSE CONTENT**

- The contracts and how they work
- What are international exploitation contracts and how do they work?
- Why do we have PSCs?
- Who gets the production?
- Contract implications at different stages in field life
- How are the contracts dealt with in the exploration phase?
- What are the objectives in the development and production phase?
- Where is the balance of risk in the contract provisions?
- Commercial issues
- How to manage the economics of international contracts
- Who pays for and carries the risk during development programs?
- Pricing issues
- Financial and nonfinancial issues
- Financing oil company and government shares
- Working with financial institutions
- General economic issues in country affecting your contract
- Safety and environmental data
- Special considerations
- What are the effects of Unitization and Redetermination?
- In what ways are gas contracts different?
- Future trends

**AUDIENCE**

Professional oil and gas company personnel at all levels and in all disciplines, including business development, contract negotiations, business analysis, strategic planning, joint-venture representation, and those involved in the investments of petroleum projects

**PREREQUISITE**

None

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Economics of Deepwater Projects

Skill – 3 Days

This 3-Day course is for attendees who already have some experience running project economics in the oil and gas industry but would like to learn how to model and evaluate the economics of deepwater development projects. An overview of the exploration, development, and production processes involved in deepwater projects will be presented. An evaluation model and method for evaluating deepwater projects will then be presented and discussed using supporting case studies. Attendees will learn how to incorporate common technical and nontechnical risks and uncertainties to arrive at a complete evaluation of the economics of deepwater projects.

**COURSE CONTENT**

- Framework for deepwater economic evaluations
- Decision framework of deepwater projects
- Development schedule and cash flow
- Deepwater decision analysis
- Decision analysis structure
- Risk identification and incorporation
- Decision trees

**AUDIENCE**

Engineers, economists, managers, or other technical staff with experience in project economics who want to learn how to model and evaluate the economics of deepwater projects.

**PREREQUISITE**

Experience with petroleum economics or equivalent.
Auditing in the Oil and Gas Industry

Skill – 5 Days

This 5-Day course provides participants with an understanding of the principles and practices applied in auditing activities undertaken in the upstream oil and gas industry. Extensive use will be made of realistic industry-based exercises and case studies to reinforce key teaching points and to provide participants with opportunities to apply the knowledge gained in a practical manner. Participants will also learn how to develop and apply a structured methodology for conducting upstream oil industry joint venture and production sharing contracts (PSC) audits.

COURSE CONTENT

- Audit origins, purposes, and types
- Audit concepts
- Internal audit
- Audit preparation and planning
- Risk assessment
- Testing and sampling
- Interviewing techniques
- The audit report
- The audit cycle
- Joint venture accounting procedure and audit rights
- Multiventure and contract audits
- The cash account and areas requiring review at audit
- Understanding unitization and redetermination
- Audit of general and administrative costs
- Audit of various cost categories
- Joint venture case study
- How a PSC audit differs from a joint venture audit

AUDIENCE

Staff new to the discipline of audit; experienced audit practitioners who wish to update skills; personnel from any discipline who are involved in internal audits, joint venture audits, or PSC audits; and accounting personnel who require an understanding of the specialized area of upstream auditing

PREREQUISITE

Some previous audit experience is preferred

Data Room Management and Rapid Asset Evaluation

Advanced – 3 Days

This 3-Day course aims to provide E&P professionals and stakeholders in the oil and gas investment sector with an understanding of how to get the most out of data rooms in order to put a reasonable evaluation in front of the decision makers in the shortest time frame possible. Learning objectives are at knowledge and application levels, and participants will take away workflows to streamline their data room processes, and only essential data are gathered, and to quickly evaluate opportunities while avoiding some of the pitfalls that exist in all assessments of oil and gas opportunities.

COURSE CONTENT

- Overview of the data rooms: a means of providing and acquiring data
- Why data rooms must be managed by the seller and the buyer
- Setting up a data room: physical or virtual or both?
- The data room workflow: what the seller wants versus what the buyer needs
- The teaser: getting potential buyers interested by sending them a flyer
- The 8 key provisions in a confidentiality agreement
- The information memorandum
- Choosing the material that is put into a data room
- Brokers and fees
- What a company needs from its data room team
- Picking the appropriate team to go into a data room
- What not to do in a data room
- Role of the data room team leader
- Hierarchy of data requirements
- Priorities of each discipline in the data room
- What needs to be done after the data room
- Being diligent about due diligence
- Calculating better estimates of hydrocarbon-in-place
- Recovery factors
- Complexity due to rocks and fluids: fractured reservoirs, gas condensate
- Using analogs when data is sparse
- Creating production profiles
- Well requirements for different scenarios
- Introducing risk and uncertainty into evaluation workflow
- Quick expected monetary value analysis
- Rapid screening techniques for more focus and better decision

AUDIENCE

E&P executives and managers, geoscientists, reservoir engineers, investors, auditors, bankers, and government officials involved in the technical and economic valuation of international oil and gas E&P opportunities

PREREQUISITE

Knowledge of petroleum exploration and production, reserves, and evaluation

Portfolio Management

Advanced – 4 Days

Course participants will learn about the portfolio theory, along with how to incorporate the best practices in portfolio management during the upstream oil and gas business planning process. The 4-day course highlights a proven process and technology for portfolio management and optimization used by companies worldwide. Participants will gain an overview of important concepts and processes for portfolio analysis, as well as learn an easy-to-follow process for portfolio optimization to meet business unit and corporate goals. Other key concepts that will be covered are accepted portfolio management workflows to model the business and decide which wells to drill, projects to undertake, or properties to acquire. This course uses Excel, as well as the Merak software Peep, Decision Tool Kit, and Capital Planning.

COURSE CONTENT

- Corporate planning in E&P
- Macro environment challenges
• Concepts of portfolio management
• Easy-to-use process for portfolio management and optimization
• Identify and evaluate strategies and scenarios and interpret results
• Portfolio management using Merak software
• Understanding and defining business rules and project dependencies
• Model and test different strategies
• Analyze and compare different portfolios
• Use visualizations to answer a variety of business questions
• Case studies of industry practices
• Address problems using portfolio management and optimization
• Group problem challenge

AUDIENCE
Anyone in a current or potential business unit or corporate planning role who needs to understand and model the performance of a portfolio for oil and gas projects

PREREQUISITE
Petroleum Economics (EF-TC1-NXT12680) and Decision and Risk Analysis (EF-TC1-NXT11350); job experience in both economics and risk is preferred, as well as experience with the Merak software; job experience can substitute for training courses

Merak Peep Fundamentals

Awareness – 2 Days

In this 2-Day course, you will explore Merak Peep flexibility when working with an economic evaluation project from entering the input parameters into Merak Peep case, adding scenarios and consolidating results, to batch processing multiple cases. Finally, the course uses Merak’s economic engine to generate cash flow.

COURSE CONTENT
• Set Merak Peep software preferences to customize views and calculation parameters
• Create, edit, and copy economic case documents
• Review essential economic inputs (production, price, ownership, provincial royalties, state taxes, international tax regimes, operating costs, capital)
• Create filters and user parameters to sort large volumes of data easily
• Use scenarios and Scenario Manager to perform rapid sensitivity analysis
• Create consolidations to value workovers and aggregate projects
• Use batch processes to edit or report multiple cases at once and calculate price sensitivity

AUDIENCE
Anyone who needs to develop or improve their skill and understanding of project economics performed with the use of Merak Peep software

PREREQUISITE
Petroleum Economics Fundamentals or equivalent knowledge

Merak Fundamentals of Petroleum Economics

Awareness – 1 Day

This 1-Day course is an excellent introduction to the fundamentals of petroleum economics and provides the technical foundation required by Merak Peep Software. You will learn key topics of petroleum economics such as: project economics, cash flow, economic indicators, types and elements of fiscal regimes. You will perform hands-on exercises on cash flows and you will evaluate the profitability of a project based on time value of the money and economic indicators.

COURSE CONTENT
• Project Economics
• Cash Flow and Economic Indicators
• The main types and elements of fiscal regimes
• Cash flows for concessionary systems and production sharing contracts

AUDIENCE
Engineers or economists interested in gaining a general understanding of petroleum economics required by Merak Peep Fundamentals course.

PREREQUISITE
Attendees should be familiar and comfortable with Windows environment

Merak Peep Decline Analysis

Foundation – 1 Day

Increase your production forecasting expertise with this course on intuitive production decline analysis workflows. Attendees will learn how use of the Merak Peep Decline module to save time, reduce duplication of effort, and tie seamlessly into their economic analysis. The attendees will better understand how this tool facilitates basic decline analysis and forecasts of production and remaining reserves.

COURSE CONTENT
• Maintaining current in-house and vendor data to understand production levels
• Fine-tuning estimates of remaining reserves
• Keeping updated historical data ready for reporting and retrieval
• Creating plots and reports based on different analysis options
• Setting up preferences to customize forecasting workflow
• Importing and exporting production history
• Creating groups and summary wells to better manage well data
• Forecasting production rates and volumes
• Linking wells to economic cases for rapid assessment of production value
• Basic decline analysis, rate-time curves, and cumulative curves
• Graphs and reports

AUDIENCE
Anyone wanting to develop or improve skills and understanding of decline curve analysis using the Merak Peep Decline module.

PREREQUISITE
Understanding of basic decline analysis techniques and theory.

Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course

Foundation – 3 Days

You explore the functionality of Merak Peep (Petroleum Economic Evaluation Program) and Merak Decline analysis software so you can navigate efficiently through the case document, edit existing data, and analyze economic runs.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

COURSE CONTENT

• Set Merak Peep software preferences to customize views and calculation parameters
• Create, edit, and copy economic case documents
• Review essential economic inputs (production, price, ownership, provincial royalties, state taxes, international tax regimes, operating costs, capital)
• Create filters and user parameters to sort large volumes of data easily
• Use scenarios and scenario Manager to perform rapid sensitivity analysis
• Create consolidations to value workovers and aggregate projects
• Use batch processes to edit or report multiple cases at once and calculate price sensitivity
• Maintain current in-house and vendor data to understand production levels
• Fine-tune estimates of your remaining reserves
• Keep updated historical data ready for reporting and retrieval
• Create plots and reports based on different analysis options
• Set preferences to customize your forecasting workflow
• Easily import and export production history
• Create groups and summary wells to better manage well data
• Forecast production rates and volumes
• Link wells to economic cases for instant assessment of production value
• Perform basic decline analysis-rate/time curves and cumulative curves
• Quickly create graphs and reports

AUDIENCE

Anyone who needs to develop or improve their skill and understanding of project economics and decline curve analysis performed with the use of the Merak Peep and Peep Decline module.

PREREQUISITE

Petroleum Economics Fundamentals or equivalent knowledge. Understanding of basic decline analysis techniques and theory.

Merak VOLTS reserves Management Fundamentals

Foundation – 2 Days

The Merak VOLTS volume tracking and reporting module provides both management flexibility and data security. In this class, attendees will learn to use the Merak VOLTS module to manage worldwide reserves and resources information and facilitate analysis of corporate value. Discussion includes an overview of technical volumes, which are based on analytical estimation methods and technical reservoir parameters.

COURSE CONTENT

• Calculating value of reserves and resources
• Updating production data and forecasts
• Monitoring reservoirs to QC production predictions
• Reports for regulation requirements
• Entering technical volumes and lease information
• Linking a well for historical production using Merak Decline or Merak VOLTS modules
• Change records and their approvals
• Batch processes (creating reservoirs, reporting, balancing)
• Reporting of reserves and resources
• Scenarios

AUDIENCE

Anyone wanting to develop or improve skills and understanding of Merak VOLTS module.

PREREQUISITE

None

Merak Peep Advanced

Skill – 1 Day

With this course, attendees will reach a new level of expertise as Merak Peep module users. The attendees will learn to quickly find and edit several Merak Peep cases, modify existing reports, and create new reports.

COURSE CONTENT

• Standard reports
• Reporting batch rollup
• Filters, groups, and hierarchies to sort and organize data
• Advanced batch functionality to perform mass edits
• Running scripts to perform multiple edits simultaneously
• Using performing result set searches and rollup reporting to calculate specific or aggregate results
• Consolidating complex royalty and other calculations
• Scheduler tool for linking cases sequentially

AUDIENCE

Anyone wanting to improve Merak Peep skills beyond the fundamental level or to
evaluate multiple projects using Merak Peep software.

**PREREQUISITE**
Merak Peep Fundamentals course.

**Merak Peep Fiscal Model Library Fundamentals**

**Skill – 4 Days**

Attendees will learn to use Merak Fiscal Model Library (FML) module to its full advantage by understanding the reporting and comparative capabilities within and between the different fiscal regimes, whether exploring a new area or analyzing projects close to home.

**COURSE CONTENT**

- Understand how the Merak Peep module and the Merak FML module work together
- Explore data entry and navigation in Merak Peep Basic FML: Reporting and graphics
- Review Merak FML working: Interest positions, consolidations, and incremental values
- Understand the modeler’s and negotiator’s Merak FML module
- Learn about fiscal scenarios and the explorationist’s Merak FML module
- Understand auditing and managing of models

**AUDIENCE**
Anyone who uses the Merak Peep Fiscal Model Library for a project evaluation.

**PREREQUISITE**
Merak Peep Fundamentals course.

**Merak Peep Software Development Kit (SDK)**

**Skill – 3 Days**

This 3-Day course will explore the functionalities of Merak Peep Software Development Kit. Participants will learn how to extend and enhance the capabilities of Merak Peep using the SDK, such as calculation routines, accessing and handling data, and creating customized interfaces for specific workflows.

**COURSE CONTENT**

- Getting Started
- Peep plug-in architecture
- Creation of new plug-ins
- File management
- Merak Peep API and OLE methods
- APIs
- Introduction to OLE methods
- Primary information (version, security, DB information, etc.)
- Peep OLE wrapper
- OLE methods for Peep well/forecasts
- Merak Peep tool plug-in
- UI design
- Communication with Peep
- Read Peep documents

**AUDIENCE**
Software developers, engineers, or economists with basic programming skills with a need for a general understanding of Merak Peep plug-in.

**PREREQUISITE**
Proficiency in Windows environment and Microsoft Visual Studio development environment, basic knowledge in Visual C#, knowledge of Merak Peep Workflow Tools is useful but not required.

**Merak Peep Software Development Kit (SDK) Using OLE Technology**

**Skill – 1 Day**

This 1-Day course is an extension of Merak Peep Software Development Kit (SDK) course, you will use Object Linking and Embedding (OLE) technology as method to communicate and exchange different types of data from Merak Peep to third-party applications. This course includes a “hands on” workshop where you will be work with SDK, OLE technology, Microsoft Visual Basic and Excel.

**COURSE CONTENT**

- Peep Object creation
- How to access Merak Peep data from third applications
- How to work with Merak Peep data using OLE technology, Microsoft Visual Basic and Excel

**AUDIENCE**
Software developers, engineers or economists with basic programming skills interested in gaining a general understanding of Merak Peep Plug-in.
**GeoX Reserve Tracker (previously Resource Management Concepts and Application)**

**Skill – 2 Days**

This 2-Day course provides participants with an overview of tracking and management resources of company assets. The course combines lectures, exercises using manual calculations, and hands-on exercises using the GeoX Reserve Tracker to illustrate resource classification concepts and their application. The main part of the course is built around realistic cases following changes in company resources and reserves within and between booking periods in terms of projects, assets and entitlements.

**Course Content**

- Introduction to reserve management basics
- Setting up the Reserve tracker for manual booking
- Creating a new project with initial prospective resources and following this through maturation to reserves on production.
- Stochastic assessment of projects
- Automatic booking from GeoXplorer
- Reporting and reconciliation

**Audience**

Reserve manager, Engineers, Commercial team members, or Managers who need to analyze and validate the project and company assets.

**Prerequisite**

- Attendees require intermediate knowledge of Excel. Knowledge of Merak Peep Workflow Tools is useful but not required.

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**Merak Capital Planning Fundamentals**

**Skill – 3 Days**

Attendees will learn how to use portfolio management as the link between strategy and opportunity. The analysis performed in Merak Capital Planning strategic portfolio management module will enable the attendees to understand their options and explore alternatives using consistent tools and processes. This course will review the basics of E&P corporate planning and the role of risk and uncertainty in portfolio management, and understand the role a solution like the Merak Capital Planning module plays within a corporate portfolio management workflow.

**Course Content**

- Creating comprehensive business strategies with optimal portfolio solutions
- Using charting and analysis tools to examine portfolio solutions
- Viewing deterministic or stochastic project or portfolio data
- Setting up business rules and goals
- Generating portfolio solutions for various objectives
- Generating project economics through Merak Peep and Merak Results Broker modules
- Loading Microsoft Excel results data through the Merak Results Broker module

**Audience**

Anyone responsible for portfolio analysis or management using the Merak Capital Planning module, including those wanting to understand the role of portfolio management in E&P.

**Prerequisite**

- Merak Peep Fundamentals course.

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**GeoX Advanced Prospect Assessment (previously Advanced Risk and Resource Assessment)**

**Advanced – 1 Day**

The Advanced Topics course covers the advanced prospect assessment options in GeoX. Primary emphasis is on the assessment of multiple-segment prospects with complex relationships between segments.

**Course Content**

- Trial browser
- Modeling contact uncertainty
- Consolidation of multi-reservoir prospects
- Leak connections
- Defining contact ranges
- Communication between segments
- Leak risk and volume dependencies
- Physical manifestation of failure
- Combining PMF with leak connections
- Depth-dependent volume methods
- Bayesian risk modification
- Conformable beds
- Risk Dependency
- Three or more segments
- Max Correlation method
- Multi Prospect Aggregation

**Audience**

The course is intended for geologists, geophysicists or engineers with recent experience using the GeoX segment and prospect tools.

**Prerequisite**

- GeoX Prospect Assessment Fundamentals (PACA)

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**Introduction to Economics of Unconventional Resources (Virtual Instructor)**

**Awareness – 2 Days**

During this virtual course, participants will learn about the types of unconventional resources and the similarities between tight gas, coalbed methane, and shale gas. The lifecycle and key economic parameters of unconventional plays will be discussed in order for participants to gain an understanding of how to model the economic viability of a potential unconventional development. Economic and Decision modeling will not be performed or practiced by participants in this virtual environment.

**Course Content**

- Definitions of unconventional resources
- Importance and impact of unconventional resources

**Prerequisite**

- GeoX Prospect Assessment Fundamental course
• Overview of worldwide unconventional resources activity
• Case studies and data on unconventional resource development
• Lifecycle of unconventional resources
• Key technical and business parameters
• Best practices for commercial evaluation
• Cash flow and decision models

AUDIENCE
Anyone interested in gaining an understanding of how to build decision and cash flow models for developing unconventional resources.

PREREQUISITE
None but some petroleum economics knowledge will be helpful.
**Exploration**

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

### COURSE OFFERINGS

**IMMERSIVE LEARNING PROGRAMS**

**COMPETENCY MANAGEMENT**

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</tbody>
</table>
## Geology of Clastic Reservoirs
### Foundation – 5 Days
This course focuses on in-depth analysis of the distribution, geometry, and sedimentary architecture of clastic reservoir facies. Attendees will learn the criteria for distinguishing reservoir facies by using wireline log and core data, how to interpret facies distributions at regional and field scales, and how to integrate this information into exploration and development projects. Numerous case studies are used to illustrate the nature of clastic reservoirs, and exercises employing log and core data support classroom lectures.

### COURSE CONTENT
- Fluvio-deltaic facies
- Sedimentary architectures
- Alluvial fan, fluvial, eolian, shoreface, deltaic, and shelf environments
- Reservoir facies
- Data integration, quality control, and analysis techniques using outcrop data, core photos, wireline logs, isopach maps, and seismic attribute maps

### AUDIENCE
Engineers, geoscientists, operating personnel, and other asset team members responsible for exploration, development, or production of clastic reservoirs.

### PREREQUISITE
Basic knowledge of sedimentary geology.

## Petrel Well Correlation
### Foundation – 3 Days
The Petrel platform offers various options for well correlation. This course provides attendees with a general overview of correlation and introduces well data import procedures with different formats and the use of the Reference Project tool. This course focuses on setting well section templates, the value of sharing templates between projects, wells, and well section windows, in addition to interpreting and editing stratigraphic and fault well tops (markers) along well paths based on log readings. Attendees will learn advanced discrete and continuous log interpreting and editing options based on existing logs, and apply the different techniques in a typical working order, from simple exploration wells to production phase.

### COURSE CONTENT
- Project organization, including Studio Favorites, Studio Find, and Studio Annotate E&P knowledge environment features
- Import procedures for wells and logs, including the Reference Project tool
- Working and setting well section and templates
- Seismic and 3D model backdrop
- Continuous and discrete log interpretation (manual, calculator, and neural nets) and log edits
- Well top interpretation and edits
- Time-depth relationship
- Creating point well data attributes
- Plotting and presenting results in different windows
- Workflows for exploration, appraisal, development, and production phases

### AUDIENCE
Development and exploration geoscientists and petroleum engineers with prior experience in the Petrel platform.

### PREREQUISITE
Petrel Fundamentals course or equivalent Petrel platform experience, and general knowledge of petroleum geology.

## Introduction to Biostratigraphy
### Foundation – 3 Days
Structured to provide basic, practical knowledge, this course covers the main fossil groups used in geologic operations, sample processing techniques, marker identification, and use of biostratigraphic charts in the geologic interpretation of drilling sections.

Biostratigraphic information is a tool routinely used in many operations, and this introductory course covers its fundamental E&P applications and limitations. Attendees will better understand the most common mistakes made while studying samples and interpreting the fossil assemblages, in addition to correctly assessing the stratigraphic level during drilling and interpret the paleontological associations.

### COURSE CONTENT
- Biostratigraphy definitions and principles
- Foraminifera, calcareous nanoplankton, and, palynomorphs
- Biostratigraphical studies while drilling
- Sample processing, picking, and identifying of fossil groups
- Biostratigraphic studies and fossil groups according to geologic section
- Design sampling strategy while drilling (exercise)
- Index and facies fossils
- Paleoenvironment assemblages and biofacies
- Principles of absolute and relative datation
- Time scale and biostratigraphic zonations
- Age interpretation based on fossils
- Use of lithostratigraphy, biostratigraphy, chronostratigraphy, and discontinuity-bounded stratigraphical units
- Key biostratigraphic events in Earth’s history
- Transgressive-regressive cycles, sequences, and interpretation
- Key sequence stratigraphy surfaces
- High-resolution biostratigraphy

### AUDIENCE
Geologists, geophysicists, petroleum engineers, drilling engineers, and other professionals working in E&P operations.

### PREREQUISITE
Basic knowledge of petroleum geology.

## PetroMod Fundamentals
### Foundation – 5 Days
This course is structured to provide attendees with the fundamentals of PetroMod software, which combines seismic information, well data, and geologic knowledge to model the evolution of a sedimentary basin. The attendees will learn how the software predicts whether and how a reservoir has been charged with hydrocarbons, including source and timing, migration routes, quantities, and fluid type in the subsurface or at surface conditions. Attendees will also gain a comprehensive overview of the one-dimensional (1D), 2D, and 3D basic workflows in basin modeling.

### COURSE CONTENT
- Introduction to petroleum systems modeling
- Structural and geochemical features of a petroleum system model
- 1D Workflow

### AUDIENCE
Development and exploration geoscientists and petroleum engineers with prior experience in the Petrel platform.

### PREREQUISITE
Petrel Fundamentals course or equivalent Petrel platform experience, and general knowledge of petroleum geology.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

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\section{IMMERSIVE LEARNING PROGRAMS}

\section{COMPETENCY MANAGEMENT}

\begin{itemize}
  \item Deformation, sutures and inclusions, rubble zones, and imaging below salt
  \item Petrophysics for exploration
\end{itemize}

\section{AUDDIENCE}

Exploration geoscientists and managers who want a fundamental understanding of petroleum systems and key geologic prospecting techniques.

\section{PREREQUISITE}

Basic petroleum geology, and knowledge of petroleum systems.

\section{Seismic Processing for Interpreters and Others}

\section{Foundation – 5 Days}

In this course, attendees gain a practical understanding of seismic data acquisition and processing. Course material encompasses acquisition, processing, imaging, and extraction of geologic and petrophysical information. Data examples, exercises, and workshops illustrate the fundamentals, practical issues, and pitfalls as they affect the interpretation and integration of seismic data and information into E&P workflows. The attendees will learn the principles involved in imaging geologic structures and properties with seismic data, and the parameters that can seriously affect seismic data quality, costs, and interpretation accuracy. In addition, attendees will learn to determine whether seismic data have been recorded and processed correctly for your interpretation objectives and how to apply quality assurance steps.

\section{COURSE CONTENT}

\begin{itemize}
  \item Zero-offset reflection coefficients and reflection coefficients’ amplitude dependence with offset
  \item Simple imaging using zero-offset data, with the use of the NMO equation and Dix interval velocities
  \item Concept of zero-offset migration
  \item Artifacts introduced by migrating incomplete data, including 2D data
  \item Role of velocity in migration
  \item Kirchhoff and reverse-time, zero-offset migration algorithms
  \item Fourier transform (amplitude and phase), convolution and correlation
  \item Normal moveout correction and stack to convert data to zero offset
  \item Estimation of stacking velocities
  \item NMO and stack’s failures
  \item Kirchhoff before-stack migration
  \item Three imaging conditions and before-stack, wave-equation migration algorithms
  \item Anisotropic migration
  \item Velocity analysis for depth migration, including tomography with attention to salt-related velocity analysis
  \item Full-waveform inversion
  \item Simplistic time migration
  \item Extended imaging condition and migration velocity analysis
  \item Multiple attenuation and role of wide-azimuth acquisition geometry in multiple attenuation
  \item Dipping multiples
  \item Statics, land and marine
  \item Amplitude corrections
  \item 1-D and 2-D filtering, including f-k filtering
  \item Wavelets and deconvolution
\end{itemize}
- Vertical seismic profile as a phase tool
- The Fresnel zone
- Improving spatial resolution
- Improving resolution of depth estimation
- Sample processing sequences
- Ramifications of processing decisions
- Noise

**AUDIENCE**
Processing geophysicists, seismic interpreters or acquisition specialists

**PREREQUISITE**
Basic understanding of the principles of Geophysics

### Petroleum Geology

**Foundation – 5 Days**

This course will enhance an attendee’s knowledge of the fundamentals of geology and how the fundamentals are integrated with engineering data to effectively and optimally manage reservoir development, in addition to learning which geologic data are needed to describe the 3D geometry of a reservoir. The tools and techniques available for reservoir characterization and how the resulting data can be combined and harmonized are also covered.

**COURSE CONTENT**
- Geologic principles, major rock types, geologic time and age dating, structural features, and plate tectonics
- Clastic and carbonate depositional systems
- Sequence stratigraphy concepts
- Carbonate reservoir properties
- Geologic mapping and cross sections
- Hydrocarbon source rocks and petroleum systems
- Trap types and mechanisms
- Play fundamentals
- Petroleum system processes, event correlation, and biostratigraphy
- Pore systems and diagenesis
- Porosity types in carbonate and clastic rocks, clay types
- Geologic modeling: Reservoir heterogeneity, scales of investigation, and flow units
- Deterministic and stochastic modeling, use of seismic data in modeling
- Seismic methods and use of seismic tools in petroleum geology

**AUDIENCE**
Geoscientists and petroleum engineers.

**PREREQUISITE**
Knowledge of basic petroleum geology as related to exploration. A knowledge of basic petroleum economics is helpful but not required.

### Economics of Petroleum Exploration

**Skill – 5 Days**

This course focuses on the business side of exploration; i.e., how does a company decide whether to move forward with a particular project? Attendees will learn how a structured decision analysis and portfolio optimization process uses the hydrocarbon volumes and risk analyses provided by exploration geoscientists to identify the projects with the best economic potential.

**COURSE CONTENT**
- Business side of exploration
- Comparison of exploration projects under different fiscal regimes
- Role of project economics
- Calculation of cash flow and net present value (NPV)
- Worldwide fiscal regimes and their impact on exploration
- Probabilities, risk, and project risk assessment
- Fundamentals of decision analysis and decision trees
- Expected monetary value
- Value of information
- Comparative analysis of multiple projects
- Strategy and portfolio analysis

**AUDIENCE**
Exploration geoscientists and managers wanting to understand the economics of petroleum exploration.

**PREREQUISITE**
Basic petroleum geology and petroleum systems.
Mapping the Subsurface with Petrel

Skill – 5 Days

This course will take the attendee through the primary techniques for constructing two-dimensional (2D) maps and sections of the subsurface, including the integration of well data and key surfaces defining the framework of geologic units in the subsurface as the foundation of subsurface evaluation. These initial 2D techniques allow the interpreter to display the 3D relationships of geologic surfaces and any associated faults, which are key to defining the spatial and volumetric aspects of the associated subsurface resource. The geologic surface and fault relationships analyzed in this course will also be linked to the overall aspects of depositional settings and structural styles that are present within global development of geologic terrains.

**COURSE CONTENT**
- Course objectives, history and principles of surface mapping across structural styles
- Wellbore correlation of vertical and directional drilling data to subsurface feature mapping
- Applications of fault and surface mapping techniques to structural styles: strike-slip, growth, compressional, and thrust
- Petrel platform mapping introduction – volumetric calculation from surface mapping
- Computer contouring techniques

**AUDIENCE**
Geologists, petroleum engineers, and geophysicists involved with the development of oil and gas reservoirs and needing knowledge of correlation and structural/stratigraphic mapping techniques.

**PREREQUISITE**
A fundamental understanding of geologic concepts. The Petrel platform software will be used in the course. Although it is strongly suggested that attendees have taken the Introduction to Petrel course, it is not required.

Petrel Prestack Seismic Interpretation

Skill – 2 Days

This exposes seismic interpreters to the use of prestack seismic data in a typical interpretation workflow involving time migrated data in amplitude- and non-amplitude-supported settings. The course includes general theory and practical aspects with hands-on exercises directly in the Petrel platform. The course covers three aspects of prestack data use as implemented by the plug-in prestack visualization prestack interpretation prestack processing.

**COURSE CONTENT**
- Quick prestack data overview (acquisition, gather, processing, stacking, etc.)
- Load prestack data into the Petrel platform
- Visualize data in the prestack and 3D windows
- Analyze data with on-the-fly stacks and single offset volumes
- Pick and apply the muting function and simple on-the-fly gather processing
- Pick and interpret prestack events
- Extract and analyze prestack event attributes
- Examples of AVD workflows in the Petrel platform supported by prestack seismic interpretation (PSI)
- SEG Y to DIO conversion

**AUDIENCE**
Geophysicists, seismic interpreters, and seismic processors.

Petrel Geophysics: Seismic Interpretation Workflow Tools

Skill – 2 Days

This course is designed to assist geophysicists and geologists learn how to effectively use the Petrel platform in the interpretation of 3D/2D seismic data. The course provides step-by-step instructions in setting up a new interpretation project, seismic data visualization and manipulation techniques, mis-tie analysis for 2D and 3D data, detailed workflow for horizon and fault interpretation, creating surfaces from seismic interpretation, using surface attributes, and 2D seismic restoration. Attendees will also be given a brief introduction to velocity modeling and depth conversion.

**COURSE CONTENT**
- Set up new project and projection system
- Import of 2D and 3D seismic data

**PREREQUISITE**
Basic Knowledge of Geology & Geophysics

Sequence Stratigraphy: Principles and Applications

Skill – 5 Days

This workshop presents the concepts and practical applications of sequence stratigraphy for petroleum exploration and production. All concepts are illustrated with field examples of seismic, well-log, core, and outcrop data. In-class exercises emphasize the recognition of sequence stratigraphic surfaces and systems tracts on well-log cross-sections, seismic lines, and outcrop profiles. The points of agreement and difference between the various sequence stratigraphic approaches (models) are discussed, and guidelines are provided for a standardized process-based workflow of sequence stratigraphic analysis. This enables the practitioner to eliminate nomenclatural or methodological confusions, and apply sequence stratigraphy effectively for facies predictions in exploration and production.

**COURSE CONTENT**
- Each day includes lectures and three to four practical exercises that illustrate the concepts covered in lectures. The following is the general break up of topics that are covered in class: introduction; historical development of sequence stratigraphy; other types of stratigraphy: chronostratigraphy, biostratigraphy, event stratigraphy; methods of sequence stratigraphic analysis: outcrop, core, well logs and seismic data; workflow of sequence stratigraphic analysis.
- Fundamental concepts of sequence stratigraphy: depositional trends; stratal stacking patterns; stratal terminations; accommodation; relative sea-level changes; forced regressions; normal regressions; transgressions.
- Sequence stratigraphic surfaces: subaerial unconformity, correlative conformity, basal surface of forced regression, regressive surface of marine erosion; maximum regressive surface, maximum flooding surface, transgressive surface of erosion, flooding surface, drowning unconformity.
- Systems tracts: lowstand, transgressive, highstand, falling-stage, low-accommodation and high-accommodation systems tracts; sequence models: depositional sequences, genetic stratigraphic sequences, transgressive-regressive sequences; standardization of sequence stratigraphy.
- Applications to depositional systems: fluvial systems, coastal systems, shallow-water clastic systems, deep-water clastic systems, carbonate systems; hierarchy of sequences and sequence boundaries; conclusions.

**AUDIENCE**
Geologists, geophysicists and reservoir engineers who want to learn the methodology for applying sequence (and seismic) stratigraphy to correlation, facies analysis and the delineation of stratigraphic traps.

**PREREQUISITE**
The Petrel Fundamentals and Petrel Geophysics courses, or equivalent Petrel interpretation experience and general geophysical knowledge. Seismic processing knowledge is advantageous.
Structural Geology and Tectonics

Skill – 5 Days

This 5-Day course is designed to increase understanding of the significant aspects of structural geology. It is structured to take attendees from the basic fundamentals of forces and how minerals react to those forces through mega-scale structures associated with plate tectonics features. Attendees will gain an understanding of different stress regimes, deformation processes, micro- and meso-scale structures that formed from those processes, the expression of those structures in seismic and well bores, and the major structural regimes associated with plate tectonics. Short, in-class exercises will be used to reinforce selected learning objectives.

COURSE CONTENT

• Fundamentals and ductile structures to introduce structural geology at the small scale.
• Brittle and other structures will focus on features produced by brittle deformation such as faulting and fracturing
• Structural expression, mapping, and modeling will be a review of the expression of faults, folds and various structural attributes within the surface seismic data and within borehole logging data
• Tectonic environments and regional tectonics will enhance understanding of the fundamentals of the Earth’s structure, plate tectonics, the Wilson cycle, and extensional, convergent, and strike slip regimes
• Global tectonic terrains and paleo-structural analysis

AUDIENCE

Geoscientists with a need to increase detailed knowledge of structural geology up to skill level

PREREQUISITE

Sound understanding of structural geology, not an entry-level course

Petrel Introduction to Structural & Fault Analysis Module (RDR)

Skill – 4 Days

This Petrel platform module, developed by the Rock Deformation Research group, provides a broad suite of tools for all aspects of visualizing, mapping, modeling, and analyzing faults in the Petrel platform workflow. Attendees will learn new ways to integrate fault geologic information into the reservoir simulation process. Examples will show the impact of fault integration into simulation models on prospect evaluations, volumes, and simulation responses. The course highlights critical risk factors that influence the analysis of prospects and field development programs and the workflows to capture the likely structural nature of the prospect or field and to understand the implications.

COURSE CONTENT

• Exploration
  - New methods for fault identification and mapping
  - Property predictions and analysis for Petrel structural framework modeling
  - Fault dip and dip direction: Mapping seismic onto faults and juxtaposition analysis
  - Tools for data cleanup for prospect creation and preparation for geomodeling
  - Streamlining the seismic interpretation process with structural sense checks
  - Creating trap maps and trap analyses
  - Fault juxtaposition mapping
  - Fault geometry and property analysis
  - Prediction of hydrocarbon column heights using capillary seals
  - Integration of geometric and property uncertainties in analyses
• Development
  - Fault seal mapping
  - Fault communication mapping
  - Geomodel analysis tools for QA
  - Fault and grid geometric analysis
  - Fault throw and displacement analysis, including profiles and cumulative frequency plots
  - Susceptibility to failure of faults
  - Fault property predictions, calculations, and filtering
  - Reservoir juxtaposition analysis
  - Fault plane maps
  - Fault transmissibility multiplier computations
  - Geologic tuning of transmissibility multipliers
  - Uncertainty incorporation of fault geometries and properties in workflow

AUDIENCE

Development and exploration geologists, geophysicists, geomechanics, and reservoir engineers with prior experience in Petrel software.

PREREQUISITE

Petrel Fundamentals course or similar Petrel experience, and general knowledge of structural geology, reservoir engineering, and geophysics.
the petroleum system into geologically-based, objective, consistent, and documented results that can be used to understand and rank opportunities. They will evaluate a concession, from initial area screening to play evaluation and lead identification to the final assessment of the prospects developed from the leads.

**COURSE CONTENT**

- Petroleum system and play-to-prospect fundamentals: lecture and exercises, exploration terminology, organization, and objectives
- Global themes: what they are and how are they used in play identification
- Petroleum systems and petroleum systems modeling basics
- Lecture and exercises
- Play identification and evaluation: fairway mapping, chance mapping, and resource assessment
- Probabilistic volumetrics and prospect chance of success
- Concession analysis workshop
- Initial screening of concession area dry-hole analysis
- Quick evaluation of hydrocarbon generation potential
- Play analysis and lead identification
- Converting reservoir play fairway maps to play element chance maps
- Seal derivation of play fairway maps from seal facies and property maps using geological concepts and sparse data
- Using predefined and user-defined compaction trends to create seal capacity maps in the Petroleum Systems Quick Look module for the Petrel platform.
- Identifying leads
- Concession analysis workshop

**AUDIENCE**

Geoscientists with a need to learn prospect exploration fundamentals and how to perform workflows using Petrel software platform

**PREREQUISITE**

Petrel Software Fundamentals, OG-SW0-SIS12520.

### Petrel Velocity Modeling

**Skill – 3 Days**

This course introduces the attendee to velocity modeling, velocity handling, and domain conversion functionality in the Petrel 2013 platform.

The course takes the attendee through the preparation stage of data used for velocity estimation and modeling. This preparation stage includes quality control and editing of checkshot data used in sonic calibration and quality control of time surfaces and well tops used for defining velocity intervals.

Furthermore, the available velocity modeling techniques are presented, including well velocity estimation, the nature and modeling of seismic velocities, surface-based and 3D grid-based seismic velocity modeling, as well as user-defined velocity functions.

Following the velocity modeling phase, domain conversion of various objects and methods for modeling structural uncertainty are covered.

**COURSE CONTENT**

- Quality control of and editing of well data
- Checkshot calibration of sonic logs
- Velocity functions and various velocity modeling approaches
- Velocity modeling quality control and modeling
- Depth error analysis and correction
- Surface-based and 3D grid-based seismic velocity modeling
- Anisotropy in seismic velocities
- Geostatistical methods
- Quantifying residual depth error and creating a depth correction model
- Creating user-defined velocity functions
- Domain conversion
- Modeling structural uncertainty

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers and technical personnel experienced with Petrel platform software.

**PREREQUISITE**

Petrel Geophysics course or similar Petrel experience.

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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Field Trip: Fluvial and Deltaic Architecture and Advanced Modeling using Petrel - Utah / Colorado, USA

Skill – 7 Days

This field and classroom-based reservoir geology and modeling course covers applied techniques for reservoir geocellular modeling. The course teaches attendees novel and practical methods to build realistic models of fluvial and deltaic sediment body architecture, demonstrated using the Petrel platform. The attendees will use the Petrel software to integrate core and well log data in a series of deterministic model exercises. The results are compared with other traditional Petrel platform modeling techniques and each is then evaluated against outcrop reality to determine which techniques are the most suitable for analogous subsurface reservoir modeling studies. The course follows the typical workflow of a subsurface 3D modeling study and is aimed at making a series of realistic predictive models of reservoir geometry and architecture using detailed knowledge of sedimentology and sequence stratigraphic concepts. This course blends lectures, modeling exercises, and over 10 field trips to sites in Grand Junction, Colorado and Green River, Utah. A full day-by-day agenda can be found at NExTtraining.net.

**COURSE CONTENT**

- Diagnostic outcrop, core, and log interpretation of fluvio-deltaic environments and facies
- Core, log and reservoir properties integration to define flow units
- Conceptual models and sequence stratigraphic framework building for reservoir modeling
- Well data correlation techniques
- Deterministic modeling techniques
- Hierarchy, zone logs, and layering applications
- Different modeling techniques and implications comparison for static connectivity

**AUDIENCE**

Geologists and reservoir modelers.

**PREREQUISITE**

Petrel Fundamentals course or minimum 3 months of Petrel use.

Practical AVO and Seismic Inversion with Petrel

Skill – 5 Days

A profitable development of an oil or gas field starts with a good understanding of the subsurface as a basis for efficient and successful field management. The integration of AVO and inversion techniques in Quantitative Interpretation helps to create the best possible petrophysics subsurface model. Improved discrimination of reservoir units are made and models are generated using logs and seismic data. These techniques lead to highly accurate or highly probable (static) subsurface reservoir modeling studies. The course follows the typical workflow of a subsurface 3D modeling study and is aimed at making a series of realistic predictive models of reservoir geometry and architecture using detailed knowledge of sedimentology and sequence stratigraphic concepts. This course blends lectures, modeling exercises, and over 10 field trips to sites in Grand Junction, Colorado and Green River, Utah. A full day-by-day agenda can be found at NExTtraining.net.

**COURSE CONTENT**

- Introduction
- Seismic Processing for AVO and inversion
- Exercise - Pre-stack Seismic Interpretation
- Exercise - Angle stack creation
- Exercise - Non-Rigid Matching
- AVO Theory
- Exercise - AVO Forward Modeling
- Practical applications of AVO analysis – fluid factor, intercept and gradient etc.
- Estimation of water saturations in shaly-sands.
- Quick look techniques to estimate the oil/water, gas/water and oil/gas contacts, salinity estimations of formation water and filtrate water, and unmoved hydrocarbon zones
- Estimation of water saturations in shaly-sands.
- Workshops: 1-2 hours daily of workshop examples

Petrophysics, Quick Look and Log Quality Control

Skill – 5 Days

This course covers the following topics:

- **Geology of Carbonates and Clastics**
- **Gamma Ray (GR) and Spontaneous Potential**: Tool physics and applications to estimate clay volume, clay type and formation water salinities.
- **Porosity and Lithology**: Density and Neutron tool physics and applications to estimate clay volume, clay type and formation water salinities.
- **Acoustics**: Tool physics and applications for rock mechanics, well bore stability, and secondary porosity
- **Resistivity Measurements**: Tool physics of Shallow Rxo, Laterolog and Induction and High Technology resistivity tools.
- **Introduction to High Technology Tools**: NMR, Borehole Imaging, Dielectric and Wireline Formation Testing.
- **Interpretations**: This covers the evaluation of:
  - Clay Volume (Vsh, Vcl),
  - Estimating the parameters of “m” and “n” in the Archie Equation,
  - Quick look techniques to estimate the oil/water, gas/water and oil/gas contacts, salinity estimations of formation water and filtrate water, and unmoved hydrocarbon zones
  - Estimation of water saturations in shaly-sands.

**WORKSHOPS**

- 1-2 hours daily of workshop examples

**COURSE CONTENT**

- Reservoir Rock; Life of a well
- Tool Conveyance, depth Control, filtrate Invasion profiling
- Basics of Logging, Log Quality Control
IMMERSIVE LEARNING PROGRAMS

Competency Management

COURSE OFFERINGS

GR Spectroscopy
The Spontaneous Potential
Acoustic Log, secondary porosity, rock mechanical properties and wellbore stability
The density and photoelectric capture cross section
The Neutron Log, neutron spectroscopy and sigma neutron capture cross-section
Density-Neutron applications for lithology, shale volume and effective and total porosities
Basics of Resistivity and the Archie Equation
The concept and applications of the Formation Factor (FF) as a variable –m emulator
Resistivity measurements in the invaded zone (Rxo)
Resistivity measurements in the uninvaded zone using Induction and Laterolog
The concept and applications of laterolog and induction array resistivity measurements
Introduction to High Technology Tools
Dielectric measurements
Magnetic Resonance Imaging and its applications
Borehole imaging
Interpretation overview of important petrophysics parameters
Estimating fluid salinities-Porosity-Lithology
Wettability and the saturation exponent (n)
Estimation of the volume of shale
Computing the values of Sw using different techniques in clean and shaly formations

Field Trip: Practical Fracture Analysis of Clastic Reservoirs with Petrel - Casper, Wyoming

Skill – 5 Days

This 5-Day course combines field and classroom training sessions that integrate model building using the Petrel platform with classic field observations. The field trip portion of the course will consist of short excursions to view the oilfield facilities, surface geology, and outcrops in the area as well as time spent viewing core. This course provides the geoscience professional with tangible examples from real-world applications. The classroom portion of the course is a hands-on session where participants will learn about the practical aspects of generating and understanding Seismic Attribute responses, starting from the mathematical geophysical generation to practical geological understanding and application.

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PREREQUISITE

None

AUDIENCE

This course will be suitable for all geoscientists and engineers who will benefit greatly from a strong foundation in petrophysics, logging tool physics and log interpretations. This course will also be particularly useful to all new hires who will be working in upstream domains.

Must have working Petrel knowledge.

NOTE: Please schedule your departing flight after 3 p.m. on Saturday. Participants must arrive in Denver, Colorado no later than noon on Sunday.
<table>
<thead>
<tr>
<th>COURSE OFFERINGS</th>
<th>IMMERSIVE LEARNING PROGRAMS</th>
<th>COMPETENCY MANAGEMENT</th>
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</table>

### Techlog Formation Evaluation

**Skill – 3 Days**

In this course, you explore the use of base modules Techplot and Techdata, and Quanti. You achieve a good grounding in the data model within the Techlog application. You explore deterministic calculations and the principles behind the powerful Application Workflow Interface for single and multiwell use. You study the integration of different data to enhance the interpretation processes. You review how to perform day-to-day tasks within the Techlog Suite and learn advanced techniques for improving the analysis results.

#### COURSE CONTENT

- Understand the Techlog interface and data structure
- Enhance data management and quality control
- Use basic plotting tools
- Use the Quanti Quick Look for Quick Look log analysis
- Create workflows for multiwell deterministic evaluation using Quanti
- Computing Petrophysical Summaries and generating Summaries report
- Monte Carlo Analysis

### Petroleum Systems and Exploration and Development Geochemistry

**Advanced – 5 Days**

This 5-Day course focuses on the dynamic petroleum system concept, exploration geochemistry of conventional and unconventional petroleum, and reservoir geochemistry. The course is designed for exploration, production, and development geologists. Lectures show how geochemistry can reduce the risk associated with petroleum exploration, how to predict oil quality from inexpensive wellbore measurements, how to identify reservoir compartments and de-convolute commingled petroleum, and how to assess completion problems. It provides interpretive guidelines for sample collection and project initiation, how to evaluate prospective source rocks, and how to define petroleum systems through oil-oil and oil-source rock correlation.

#### COURSE CONTENT

- Objectives, Terms, Nomenclature
- Petroleum System Folio Sheet: Map and Cross Section at Critical Moment, Table of Accumulations, Event Chart, Burial History Chart
- Timing of Petroleum System Events and Processes
- Introduction to Basin and Petroleum System Models
- Origin and Preservation of Sedimentary Organic Matter
- Project Initiation and Sample Collection, Exercises
- Vitrinite Reflectance: Thermal Maturity, Calibration, Kinetics
- TOC, Rock-Eval Pyrolysis, Geochemical Logs
- Fractional Conversion, Original TOC, Expelled Petroleum, Expulsion Efficiency
- Interpretive Pitfalls; Exercises
- Gas Chromatography, Stable Isotopes, Surface Geochemical Exploration
- Semivariograms and Spatial Significance of Data
- Biomarker separation and analysis
- Gas Isotope Logging, Fluid Inclusion Volatiles, Diamondoids
- Interpretive Pitfalls; Exercises
- Thermal Maturity Parameters; Cracking, Thermochemical Sulfate Reduction
- Biodegradation Parameters
- Ancillary Geochemical Tools; Semi-Volatile Aromatics, Light Hydrocarbons, Mud Gas Isotope Logging, Fluid Inclusion Volatiles, Diamondoids
- Chemometrics for Correlation, Mixture Analysis
- Interpretive Pitfalls; Exercises
- Exploration Geochemistry Case Studies
- Objectives, Terms, Nomenclature
- Migration and Compartments
- Migration Mechanisms: Diffusion, Solution, Gas-Phase, Oil-Phase
- Sample Collection/Water Chemistry
- Gravity Segregation, Biodegradation/Water Washing
- Phase Changes: Deasphalting, Wax Crystallization, Retrograde Condensation, Evaporative Fractionation

### Subsurface Facies Analysis - Integrating Borehole Images & Well Logs with Petrophysical and Seismic Data to Develop Geologic Models

**Skill – 5 Days**

This course presents an integrated approach to subsurface facies analysis by combining image and dip data interpretation with outcrop studies. The approach uses high-resolution seismic data to refine complete reservoir models. Attendees will learn the integrated approach from examples and case studies.

#### COURSE CONTENT

- Data acquisition, processing, and structural analysis
- Structural analysis using image and dip data
- Sedimentology and continental settings
- Eolian sediments
- Fluvial sediments and fluvial settings (various models)
- Deltaic, coastal, and shelf siliciclastic settings
- Deltaic, coastal, shelf, deepwater, and carbonate sediments
- Carbonate models and facies in coastal and shelf settings
- Fractured reservoirs and fracture systems
- Fractured reservoir case studies
- Geothermal systems in volcanic rocks

### Audience

- **Audience**
  - Geoscientists interpreting seismic data volumes
  - **Prerequisite**
    - Petrel Fundamentals training course is required.
    - Petrel Geophysics course is recommended.

- **Audience**
  - Geoscientists, engineers, and technical staff responsible for analysis and integration of image and dip data.
  - **Prerequisite**
    - Basic geology and reservoir modeling background.
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

• Thermal Maturation, TSR, Reactive Polar Precipitation
• Interpretive Pitfalls; Exercises
• Gas Chromatography, Stable Isotopes
• Oil Fingerprinting; Reservoir Compartments
• Leaky Casing, Production Allocation
• Interpretive Pitfalls; Exercises
• Hydrocarbon and Non-Hydrocarbon Gases
• Gas Shale and Other Unconventionals
• Reservoir Geochemistry Case Studies

AUDIENCE

Geoscientists needing knowledge of Petroleum Systems, Petroleum Geochemistry and Basin Modeling

PREREQUISITE

Knowledge of Basic Petroleum Geology and Petroleum Systems

A Strategic Approach to Oil and Gas Exploration

Advanced – 4 Days

This course focuses on understanding the use of strategic planning to optimize the probability of success in oil and gas exploration. The course includes recognizing the need for strategic change and developing options to respond to changing business environments, in addition to implementing new strategic directions and managing and monitoring performance.

The course builds on a number of case studies of strategic change and what can be learned from these scenarios. The course scope includes the technical, economic, and political drivers that shape the performance of all oil and gas organizations. The course will cover the importance of strategic planning at all stages of the exploration value chain (access through to basin selection and exploration play testing).

The attendees will gain an understanding of how to recognize the need for a strategic approach, how to develop a set of strategic options, and then how to select and implement the appropriate strategy for a given situation.

COURSE CONTENT

• Strategic change and organization life cycle
• Identify the key ingredients for winning strategies
• Exploration life cycle
• Exploration value chain
• Portfolio management – managing exposure
• Exploration process
• Delivering strategic change, organization, and performance
• People development
• Technology
• Monitoring and reviewing performance

AUDIENCE

Geologists, geophysicists, team leaders, and managers.

PREREQUISITE

None
Field Development Planning

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked ⬤ while technical courses that use software have been marked ⬤ and the courses with practical sessions (either hands-on operational or software or both) are highlighted with ⬤. There are some courses that use simulators and are highlighted with ⬤.

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>DOMAIN</th>
<th>SOFTWARE</th>
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<tbody>
<tr>
<td>Geology and Geophysics</td>
<td>Advanced Reservoir Monitoring</td>
<td>Applied Production Logging and Reservoir Monitoring</td>
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<tr>
<td>Petrophysics</td>
<td>Resources and Reserves Evaluation</td>
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<tr>
<td>Reservoir Engineering</td>
<td>Production Engineering</td>
<td>Management and Economics</td>
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<tr>
<td>Advanced</td>
<td>Project Risk Analysis and Management</td>
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</tbody>
</table>

### Advanced

- Advanced Integrated Reservoir Analysis
- Conducting an Integrated Reservoir Study
- Applied Geostatistics for Petroleum Engineers and Geoscientists
- Risk, Uncertainty, and Decisions in E&P Projects
- Integrated 3D Reservoir Modeling Workshop
- Intermediate Production Logging and Reservoir Monitoring
- Clastic Sedimentology for Exploration and Development
- Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel

### Skill

- Integrated Reservoir Analysis
- Petroleum Economics
- Well Placement Fundamentals
- Introduction to Reservoir Engineering
- Project Management
- Development Geology
- Basic Reservoir Monitoring
- Basic Production Logging
- Basic Logging Methods and Formation Evaluation
- Prospect Evaluation, Risks, and Volumes
- Introduction to Field Development Planning
Field Development Planning

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<tr>
<th>COMPONENT LEVEL</th>
<th>Petrel</th>
<th>ECLIPSE</th>
<th>MEPO</th>
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<td>Petrel Well Design</td>
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<td>Petrel Structural Modeling</td>
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<td>Petrel Uncertainty Analysis and Assisted History Matching</td>
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<td>Petrel Velocity Modeling</td>
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<td>Petrel Geology</td>
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<td>ECLIPSE Blackoil Reservoir Simulation</td>
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<td><strong>FOUNDATION</strong></td>
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<td>Petrel Reservoir Engineering - 3 Day</td>
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<td>MEPO Introduction</td>
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<td>Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course</td>
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Visit NEExTtraining.com/classes for the latest calendar or to register for a course.
Field Development Planning

NEXT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

**DOMAIN**  
OFM  
PIPSIM - INTERSECT

**SOFTWARE**

<table>
<thead>
<tr>
<th>Techlog</th>
<th>Integrated Asset Modeler</th>
<th>COMPETENCY LEVEL</th>
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<tbody>
<tr>
<td>Techlog for Geologists</td>
<td>Integrated Asset Modeler Fundamentals</td>
<td><strong>ADVANCED</strong></td>
</tr>
<tr>
<td>INTERSECT Reservoir Simulation</td>
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<td><strong>SKILL</strong></td>
</tr>
<tr>
<td>PIPSIM Gas Field Production Operation</td>
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<td><strong>FOUNDATION</strong></td>
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**OFM Fundamentals Using Gas Operations Examples**

**OFM Fundamentals Using Oil Production Examples**
**Introduction to Field Development Planning**

*Foundation – 5 Days*

This 5-Day course covers the fundamental approach to working with and writing a field development plan (FDP), which is the output of a sequence of decision- and discipline-based tasks to create a development plan. It is the basis for a method of developing, producing, and maintaining hydrocarbon resources, including surface design, and it provides input for designing the associated surface facilities. The combined surface and subsurface documents form the basis for financial decisions. Attendees will be introduced to all these concepts as they are applied in the process of creating a development plan in relation to the reservoir life cycle.

**COURSE CONTENT**

- Introduction to the different phases of a reservoir life cycle, including the reason for and the need to create a field development plan to appropriately exploit the reservoir
- Introduction to different field development options for the reservoir
- Discussion of data integration and interdependence, including integration and timing of subsurface and surface decision making
- Discussion of the different interfaces and their relationships, data gathering, and need for reservoir monitoring
- In-depth discussion of various components of an FDP, highlighting the different tasks and activities that need to be done and reported
- Review of the concepts of FDP, including an introduction to opportunity framing, workflow, road map, risk register, and stakeholder mapping.

**AUDIENCE**

Multidisciplinary asset teams comprising engineers, geoscientists, and managers involved in developing hydrocarbon resources and other actual or potential asset team and other members.

**PREREQUISITE**

Engineering or geoscience background.

**Basic Logging Methods and Formation Evaluation**

*Foundation – 5 Days*

In this introduction to openhole data acquisition, interpretation concepts, and practices, attendees will learn the primary logging tools used, the physics of how the measurements are made, and best practices to determine porosity and water saturation. Topics include new high-technology tools and their application to conventional and unconventional environments, including nuclear magnetic resonance (NMR), logging while drilling (LWD), wireline formation testing, and borehole imaging. The attendees will also learn how to interpret actual log data in exercises designed to strengthen your understanding and interpretation skills.

**COURSE CONTENT**

- Reservoir rock, sedimentary basins, rock properties, carbonates, clastics, shales, and diagenesis
- Logging overview
- Spontaneous potential (SP) and gamma ray
- Porosity logs: Density, neutron, and acoustic
- Resistivity basics, deep-reading tools, true resistivity, shallow-reading tools, and flushed-zone resistivity
- Shale volume computations
- Quicklook methods
- Water saturation computations in the presence of shale
- Carbonates and their challenges
- NMR
- Borehole imaging

**AUDIENCE**

Petrophysicists, geoscientists, engineers, and log analysts wanting to increase their understanding of basic log analysis.

**PREREQUISITE**

None

**Prospect Evaluation, Risks, and Volumes**

*Foundation – 5 Days*

Risk and volume assessments form the basis for decisions on whether to drill or not drill a well, and as such, form the link between subsurface evaluation and the business aspects of the petroleum industry. This course explains how risks and volumes can be assessed in a realistic manner based on a sound understanding of the geological details of the prospect as well as of its regional geological setting and current play understanding.

At the conclusion of the course, the participants will have an excellent understanding of the essentials required for realistic risk and volume assessments of exploration prospects. The course allows participants to produce well-considered and realistic assessments for prospects in which they may be involved, and to understand and constructively challenge risk and volume assessments of colleagues and partners or competitors.

**COURSE CONTENT**

- Risk and volumes assessment fundamentals
- Risk and uncertainty difference
- Statistics fundamentals, including distribution curves, expectation curves, adding and not adding risk volumes, and Bayes theorem
- Trap, reservoir, seal, and charge uncertainties
- Consistent and realistic risk estimation
- Volume range calculations for prospects and portfolios of prospects; prospect volume summations for a correct representation of prospect portfolios
- Geophysical evidence incorporated DHIs in a realistic risk assessment

**Basic Production Logging**

*Foundation – 5 Days*

Production logging tools have specific uses as well as limitations. Attendees will learn the various applications for these tools, the interpretation assumptions that are integral to their designs, and how log quality is affected by the acquisition process. Hands-on demonstrations teach the fundamentals of production log interpretation, and an in-class workshop focuses on the interpretation of single- and two-phase flow. Discussion includes use of these logs for measuring three-phase flow.

**COURSE CONTENT**

- Inflow and outflow performance and productivity index for oil and gas wells
- Tool conveyance using tractors and coiled tubing
- Depth control in cased wells using gamma ray and casing collar locator data
- Completions for vertical, deviated, horizontal, and multilateral wells
- Pressure-control system for rigless operation
• Reservoir fluids properties, including gas/oil ratio, bubblepoint pressure, and three-phase diagrams
• Reservoir drive mechanisms and associated production problems
• Justification of production log acquisition
• Standard production logging tools
• Techniques for measuring oil, water, and gas rates
• Interpretation of logs for single-, two-, and three-phase production

AUDIENCE
Geoscientists or engineers responsible for interpreting production logs.

PREREQUISITE
Engineering or geoscience degree recommended as this course deals with production logging physics.

Development Geology

Foundation – 5 Days

This course provides attendees with the fundamental skills to construct geologic models and understand the factors that affect field operations and field management. The course covers from the gathering and interpretation of geologic data to the preparation of geologic models to the quantification of subsurface uncertainty, in addition to applying geologic concepts, constructing maps and sections, and validating computer-generated interpretations. Also included are calculating subsurface volumes and assessing their uncertainties, preparing a well proposal, planning appraisal wells, and assessing their economic value. Attendees will acquire practical experience by working in teams on an actual field study.

COURSE CONTENT
• Scope of oil and gas business
• Subsurface models, input data, and modeling concepts
• Gathering, processing, and interpreting seismic data
• Structural types, traps, fault seals, maps and sections, and correlations
• Clastic sedimentary environments
• Basic well technology, horizontal wells, well data, log and core data, uncertainties, and mapping
• Carbonate reservoirs
• Subsurface development options
• Volumetrics and subsurface uncertainties
• Static and dynamic models
• Field operations, well design, and geologic input
• Development options, project planning, and phased costs
• Impact of subsurface uncertainty on project economics

AUDIENCE
Engineers and geologists involved in reservoir appraisal and development projects.

PREREQUISITE
Basic understanding of reservoir and petroleum geology.

Well Placement Fundamentals

Foundation – 5 Days

This course introduces the concept of geological well placement (geosteering) and provides knowledge of the processes and techniques that can be used to successfully place high-angle and horizontal wells using geological and petrophysical data in real-time during drilling. The main purpose of high-angle and horizontal wells is to maximize reservoir contact and enhance well productivity. To plan and construct such wells requires real-time collaboration between geologists, who need quality formation evaluation data; drillers, who require considerable input from the geologists; and petrophysicists, who interpret the formation evaluation data during the drilling process to optimize well placement. This process is generally facilitated by the well placement coordinator. Various technologies involved in directional drilling, measurement, and formation evaluation while drilling are reviewed. The three different methods used to geologically place horizontal wells are introduced and the applications are discussed.

COURSE CONTENT
• Geological well placement
• Reservoir geology review
• Directional drilling
• Measurement while drilling
• Formation evaluation and LWD
• Applications of LWD measurements in well placement
• Applications of well placement methods
• Case studies illustrating the use of the three well placement methods

AUDIENCE
Multidisciplinary asset teams of operating companies comprising mainly drilling engineers, reservoir engineers, and geoscientists who need to make decisions regarding the applicability and benefits of implementing a geological well placement process for drilling horizontal and high-angle wellbores.

PREREQUISITE
Geoscience or engineering degree.
Introduction to Reservoir Engineering

Foundation – 5 Days

This 5-Day course will introduce participants to the basics of reservoir engineering. It will cover the role of reservoir engineers in exploration and production. Participants will also learn about fluid and rock properties used in reservoir engineering applications and the fundamental concepts of fluid flow in porous media. Multiphase situations, types of oil and gas reservoirs, reservoir drive mechanisms, the basics of material balance and decline curve analysis, and reserve definitions will also be discussed.

**COURSE CONTENT**
- Overview of Reservoir Engineering
- Reservoir life cycle
- Reservoir formation properties
- Fundamentals of reservoir fluids phase behavior
- Darcy’s Law and fundamentals of fluid flow in porous media
- Principles of Well Testing in reservoir characterization
- Oil and Gas Well Inflow Performance Analysis
- Reservoir Drive Mechanisms
- Principles of Material Balance Analysis
- Immiscible displacement concepts
- Definition of Reserves and Volume Estimation Methods
- Decline Curves Analysis

**AUDIENCE**
Individuals who are training to become engineers, geologists, or geophysicists.

**PREREQUISITE**
None

Project Management

Foundation – 5 Days

This course satisfies the PMI® certification 35-hour training requirement. In this course, attendees will gain in-depth and comprehensive exposure to the key skills and knowledge they need for effective project management as described in the Association for PMI’s “PMBoK Body of Knowledge” and the Project Management Institute’s “A Guide to the Project Management Body of Knowledge.” Course instruction is through a combination of lectures, practical exercises, and interactive sessions. The attendees draw upon their own experiences and real-world examples to enhance the learning experience. The topics, disciplines, and enabling skills are progressively built upon and linked to the development of case studies in a team environment. This course, taught by a PMI registered education provider, prepares the attendees for the PMI’s PMP certification examination.

**COURSE CONTENT**
- Project financial appraisal
- Scope management, including work definition
- Time management: Planning and scheduling
- Cost management: Monitoring and control
- Risk management
- Procurement and contracts
- Alliances and partners
- Quality
- Human resources management

**Integrated Reservoir Analysis**

Foundation – 5 Days

This course focuses on the skills required for integrated analysis of rock, pore, and fluids data and how to solve problems associated with identifying and exploiting reserves. The attendees will improve their understanding of pore scale interaction, including rock texture characteristics and petrophysical rock typing techniques, in addition to learning how to use pore geometry tools such as core analysis of porosity and permeability, capillary pressure, wettability, and relative permeability. The attendees will also better understand how to integrate these measurements with well log information to predict petrophysical rock types and flow units, plus gain experience with NExT QuickScan and quicklook techniques through in-class exercises.

**COURSE CONTENT**
- Geological framework of reservoirs
- Environments of deposition: Carbonates and clastics
- Scale of the pore system: Core versus logs
- Lab-measured porosity and permeability
- Winland R35 method for petrophysical rock type, with emphasis on pore-throat radius
- Petrophysical rock types: Impact of water saturation
- Capillary pressure measurements: Pore-throat radius and water saturation above free water
- Flow units: Flow capacity versus storage capacity
- High-flow zones and barriers

**AUDIENCE**
Geologists, geophysicists, engineers, and petrophysicists wanting to learn improved interpretation workflows.

**PREREQUISITE**
Intermediate understanding of geology and petrophysics.

Petroleum Economics

Foundation – 4 Days

The course teaches the fundamentals of petroleum economics as applied to selecting oil and gas projects, including a review of the time value of money concepts.

**COURSE CONTENT**
- Introduction to petroleum economics
- Forecasting production volumes
- Entering and using product prices
- Calculating royalty and interest
- Understanding operating expenses, capital investments, depreciation, and taxes
- Understanding inflation, escalation, and discounting
- Calculating cash flow, economic indicators, and net present value
- Understanding worldwide fiscal systems

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
• Performing incremental analysis
• Selecting projects

AUDIENCE
Anyone wanting a fundamental knowledge of petroleum economics.

PREREQUISITE
None

Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel

Skill – 5 Days

This 5-Day interactive and practical course will introduce the procedures and workflow for building a 3D model, teaching attendees about the use geological modeling to produce realistic volumetric estimations for hydrocarbon reservoirs. It will show how new operational data and revised interpretations can be identified and incorporated into models at any point in the workflow. Exercises will be done using the industry-standard Petrel* E&P software platform.

Relevant industry case studies and practical applications will be reviewed throughout the course. Attendees will gain an understanding of the key challenges associated with building effective 3D reservoir models, from interpretation and design to quality assurance and optimization of results.

They will also gain an understanding of the science and workflows behind building consistent 3D reservoir models, including fluid distribution, permeability, compartments, and volumetric estimation and learn how to integrate data from cores and logs and how to upscale the data into geological and flow simulation models that will have a high impact on field development and production scenarios.

COURSE CONTENT
• Conceptual design and workflow
• Reservoir envelope: top and base structure
• Internal framework: correlation scheme
• Reservoir compartments: fault geometry
• Reservoir architecture: facies model
• Petrophysical property distribution
• Volumetric assessment
• Reservoir framework
• Depth conversion uncertainty
• Model surface selection and quality control
• Fault modeling and compartments
• Stratigraphy and correlation
• Grid construction
• Reservoir architecture
• Depositional models and facies analysis
• Core log integration
• Basic statistics
• Objects and indicators
• Seismic conditioning
• Facies modeling
• Property modeling in 3D
• Basic petrophysics
• Rock typing
• More basic statistics

• Porosity models
• Saturation models
• Permeability models
• Uncertainty and Upscaling
• Geological model analysis
• Hydrocarbon volumes initially in place
• Drainable volumes
• Simulation grid construction
• Property upscaling
• Multiple scenarios, realizations, and ranking

AUDIENCE
Geologists, geophysicists, petrophysicists, reservoir engineers, drilling engineers, and seismic interpreters

PREREQUISITES
Basic knowledge of Petrel E&P software platform and a basic understanding of the principles of geology and log analysis.

Clastic Sedimentology for Exploration and Development

Skill – 5 Days

This course covers the fundamentals of clastic sedimentology at scales for both regional exploration and detailed reservoir characterization. Reviews of the main types of sedimentary basins are presented to the attendees in the context of crustal dynamics. Plate tectonics and the production and transport of clastic materials are included for different tectonic, topographic, and climatic settings. Emphasis is on the practical interpretation of subsurface data—seismic, core, and wireline logs—for facies analysis and reservoir characterization. Examples draw from different facies, ages, and basinal settings. Particular attention is given to the principles by which depositional settings are interpreted using both outcrop and subsurface data and to the best correlation methods for different settings.

COURSE CONTENT
• Types of sedimentary basins in different tectonic contexts
• Large-scale tectonic settings of main types of sedimentary basins and relationship between structural style and fill patterns
• Effects of base-level changes and syndepositional tectonics on sediment distribution patterns
• Correlation in different sedimentary settings
• Role of analogs in building reservoir models in different depositional settings
• Sediment generation and supply in different settings
• Fluid dynamics and rheology of erosion, transport, and deposition
• Basic mechanics of sediment erosion, transport, and deposition; resultant bedforms and sedimentary structures
• Postdepositional processes and products

AUDIENCE
Exploration and development geologists, geophysicists, and reservoir engineers who need an overview of sedimentary organization across a range of scales in different basinal and environmental settings.

PREREQUISITE
None
Integrated 3D Reservoir Modeling Workshop

Skill – 5 Days

In this workshop, attendees learn a hands-on practical workflow for building a static reservoir model using the Petrel platform. Course topics include a solid presentation of the theory and methodologies behind 3D reservoir modeling with practical applications. Attendees will learn a step-wise approach to model building that starts with an overview of reservoir modeling, building of a structural framework, continuing with layering and gridding, and populating the model with reservoir properties. The attendees will gain valuable experience in the use of volumetrics with uncertainties and basic geostatistics.

**COURSE CONTENT**
- Petrel platform data import and export review
- Well correlations: Generate and edit well tops
- Structural modeling: Fault modeling, grid design, quality checking, zonation, and layering
- Statistics and data analysis review
- Basics of geostatistics and variogram analysis, introduction to kriging, and estimation techniques
- Deterministic and property modeling, including facies modeling
- Property data (petrophysics, seismic, and well-test data) integration
- Volumetric calculations exercise, with multiple realizations and ranking
- Design and properties upscaling

**AUDIENCE**
Geoscientists or engineers desiring a practical approach to building 3D reservoir models with the Petrel platform.

**PREREQUISITE**
Basic understanding of Petrel platform.

Intermediate Production Logging and Reservoir Monitoring

Skill – 5 Days

This course provides attendees with in-depth instruction on cased hole logging tool physics, interpretation, and QC techniques for wellbore-specific production logging and reservoir monitoring scenarios. Attendees learn how and when to use these tools to meet logging objectives and quicklook techniques for identifying log QC problems. Using real-world examples, the attendees learn to interpret behind-casing resistivity data and measure three-phase flow using production logs.

**COURSE CONTENT**
- Inflow performance and productivity index for oil and gas wells
- Outflow performance: Matching inflow with outflow to optimize productivity
- Flow regimes in vertical, deviated, and horizontal wells
- Techniques for measuring individual fluid velocities of oil, water, and gas
- Three-phase holdups from electrical and optical sensors
- Production logging in horizontal wells
- Pulsed neutron log physics, capture cross section, and carbon/oxygen logging
- Cased hole formation resistivity data
- Workshops: Capture mode for evaluating water and gas saturation; Interpreting behind-casing resistivity logs; Three-phase flow

**AUDIENCE**
Petrophysicists and engineers responsible for wellbore diagnostics or reservoir monitoring who want a detailed understanding of cased hole logging tools.

**PREREQUISITE**
Basic Production Logging and Basic Reservoir Monitoring courses or more than 1 year of experience with applied cased hole logging.

Applied Geostatistics for Petroleum Engineers and Geoscientists

Skill – 5 Days

The focus of this course is to produce a consistent reservoir description through integration of core, well log, and seismic data and application of geostatistical techniques. Attendees will learn the reservoir modeling workflow, from construction of the 3D static reservoir model through upscaling for dynamic reservoir simulation, in addition to increasing your awareness of geostatistics and the situations that can benefit from application of geostatistical techniques. Instruction includes guidance through assembly and analysis of the required data for geostatistical techniques and the resulting numerical models.

**COURSE CONTENT**
- Basic probability theory and univariate and bivariate statistics
- Geologic content of data and spatial continuity of rock properties using variogram analysis
- Estimation methods, including various types of kriging
- Simulation methods, including sequential Gaussian simulation and indicator simulation
- Advanced geostatistical techniques, including object modeling and simulated annealing
- Techniques for upscaling and data integration (3D seismic and production data)

**AUDIENCE**
Practicing reservoir engineers, production engineers, and geoscientists working as a part of an integrated reservoir management team.

**PREREQUISITE**
Knowledge of basic mathematics.

Risk, Uncertainty, and Decisions in E&P Projects

Skill – 5 Days

Understand why projects can fail because of adverse events with geologic, technical, commercial, or contractual origins. In this course, attendees will increase their understanding of how risk and uncertainty impact the decisions on which projects they select, how to develop them, and how these decisions affect their economic performance. Improving the quality of decisions is the main goal of this course; not just understanding risk and uncertainty for their own sake. Probabilistic concepts and tools are used to describe projects with risk and uncertainty to give a better understanding of the principles and tools underlying these concepts.

**COURSE CONTENT**
- Probability overview and simple exploration economics
- Dependencies
- Decision analysis
- Decision trees, Bayes formula, and the value of information
- Uncertainties
- Components of accuracy
- Monte Carlo analysis and its application
- Correlations and regressions
- Geostatistics: Stationary assumptions, variograms, kriging, cokriging, filtering, and multiple realizations

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Advanced Integrated Reservoir Analysis

**Skill – 10 Days**

Using a subsurface integration model can resolve reservoir problems that range from petrophysical rock typing to log analysis. In this course, attendees will learn how to perform an integrated analysis of rock, pore, and fluids data and how to solve problems associated with identifying and exploiting reserves. The attendees will apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques, in addition to learning how to identify lithologic zones and fluid types from log data, follow simple procedures for rapid and accurate interpretation, and apply correlations to core and petrophysical rock type zonation to upscale log data for reservoir simulation applications. Course materials cover advanced interpretation for better understanding of dataset limitations and measurement requirements for effective reservoir development and reservoir drive mechanisms, recovery factor, and simulation models. The attendees will gain experience with NExT QuickScan and quicklook techniques through in-class exercises.

**COURSE CONTENT**

- Integrated reservoir analysis overview and case histories
- Petrophysical rock types and flow units
- Principles of saturation distribution and capillary pressure from laboratory data
- Quicklook analysis and interpretation techniques
- Saturation calculations
- Tool corrections for resistivity and flushed zone (Rxo) measurements, and tornado chart corrections
- Porosity measurements (sonic, neutron, and density)
- Capillary pressure and electrical rock properties
- Quicklook carbonate and shaly sand analysis
- Advanced log analysis

**AUDIENCE**

Petrophysicists, geoscientists, and engineers responsible for reservoir characterization who rely on core interpretation and other integrated petrophysical data for decisions and analyses.

**PREREQUISITE**

Basic understanding of geological concepts and reservoir characterization.

Applied Project Management - Oil and Gas

**Skill – 5 Days**

The focus of this course is delivery of project management techniques for estimating, planning, managing, and controlling an oil and gas project. It extends to identification, assessment, and control of qualitative risks, as well as quantitative risk analysis using the basics of probability. Delivered in a workshop style, the course combines lectures on how to develop relevant estimates, plans, and risk analysis with the course case study project. The workshop format can be adapted to develop estimates, plans, and risk analyses as deliverables for client-specific projects. All terms and techniques used are compatible with the PMI’s “A Guide to the Project Management Body of Knowledge.”

**COURSE CONTENT**

- Terms, processes, and stage gate reviews in capital value process
- PMI processes for management of oil and gas projects
- Decision-support reports and documents
- Project life cycle definitions and estimations
- Scope management and work breakdown structures
- Use of Microsoft® Project in project planning and control
- Basic project cost and progress recording

**AUDIENCE**

Geoscientists and petroleum engineers responsible for conducting comprehensive reservoir studies.

**PREREQUISITE**

Background in petroleum engineering or geosciences and experience in reservoir studies.
Advanced – 5 Days

Encompassing advanced techniques for production logging and reservoir monitoring, this course teaches attendees the design of a data-acquisition program for evaluation of wellbore or reservoir behavior based on field development objectives. Hands-on examples demonstrate in-depth log interpretation techniques for resistivity measurements acquired behind casing, three-phase flow in horizontal wells, and fluid saturations. Attendees will learn quicklook techniques for log QC as well as how to plan and integrate multisource data for a more complete evaluation.

**AUDIENCE**

Professionals with geoscience background and minimum of 2 years of exposure to field production.

**PREREQUISITE**

More than 2 years of experience interpreting reservoir monitoring logs (attendees are encouraged to bring difficult log examples for in-class discussion and interpretation).

**Course Content**

- Inflow and outflow performance and productivity
- Flow regimes and slippage velocities in vertical, deviated, and horizontal wells
- Various techniques for measuring oil, water, and gas velocity
- Measurement of three-phase holdups using electrical and optical sensors
- Spinner calibrations in vertical, deviated, and horizontal wells
- Three-phase production logging in horizontal wells
- Physics of pulsed neutron and carbon/oxygen logging
- Pressure data and formation fluid sample acquisition behind casing
- Workshop: Use of capture and carbon/oxygen modes for evaluating water and gas saturations
- Workshop: Interpreting resistivity logging measurements acquired behind casing
- Workshop: Production logging in horizontal wells with three-phase flow

**Resources and Reserves Evaluation**

Advanced – 5 Days

This course presents advanced techniques for reserves estimation and addresses the difference in classification of resources and reserves. Attendees will learn definitions of reserves and resources and guidelines for their application from various regulatory and industry authorities, including Society of Petroleum Engineers (SPE), World Petroleum Council (WPC), American Association of Petroleum Geologists (AAPG), and the US Securities and Exchange Commission (SEC). Attendees will discover the latest and most accurate methods for estimating reserves, both deterministic and probabilistic, and gain a thorough understanding of various reserves levels and their equivalence in both systems, including proved, proved plus probable, and proved plus probable plus possible.

**Course Content**

- Basic definitions and classifications
- Statistics and probabilities
- Simulation
- Probability and uncertainty
- Expected value, and expected value and decision trees
- Utility theory
- Unconventional resources
- Reserves definition and classification
- Time value of money
- Before-tax and after-tax cash flows
- Decline curves
- Volumetrics

**Audience**

Professionals with geoscience background and minimum of 2 years of exposure to field production.

**Prerequisite**

More than 2 years of experience interpreting reservoir monitoring logs (attendees are encouraged to bring difficult log examples for in-class discussion and interpretation).

**Course Offering**

Applied Production Logging and Reservoir Monitoring

Advanced – 5 Days

Through immersive workshops, participants will learn to design data-acquisition programs for evaluating wellbore or reservoir behaviors based on field development objectives. The course features hands-on examples of advanced log interpretation techniques for resistivity measurements acquired behind casing, three-phase flow in horizontal wells, and fluid saturations. Attendees will also learn quick look techniques for log QC, as well as how to plan and integrate multisource data for a comprehensive evaluation.

**Audience**

Geoscience professionals with at least 2 years of experience in reservoir monitoring.

**Prerequisite**

At least 2 years of experience interpreting reservoir monitoring logs, recommended. Attendees are encouraged to bring difficult log examples for in-class discussion and interpretation.

**Course Content**

- Inflow and outflow performance and productivity
- Flow regimes and slippage velocities in vertical, deviated, and horizontal wells
- Various techniques for measuring oil, water, and gas velocity
- Measurement of three-phase holdups using electrical and optical sensors
- Spinner calibrations in vertical, deviated, and horizontal wells
- Three-phase production logging in horizontal wells
- Physics of pulsed neutron and carbon/oxygen logging
- Pressure data and formation fluid sample acquisition behind casing
- Workshop: Use of capture and carbon/oxygen modes for evaluating water and gas saturations
- Workshop: Interpreting resistivity logging measurements acquired behind casing
- Workshop: Production logging in horizontal wells with three-phase flow

**Resources and Reserves Evaluation**

Advanced – 5 Days

This course offers advanced techniques for reserves estimation and addresses the differences in classification between resources and reserves. Attendees will gain insights from leading regulatory and industry authorities, including SPE, AAPG, WPC, and SEC. They will explore modern methods for estimating reserves in both deterministic and probabilistic frameworks, gaining a comprehensive understanding of reserve levels and their equivalences across different systems.
OFM Fundamentals Using Oil Production Examples

Foundation – 2 Days

This course introduces the attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared oil and waterflood production project. The course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in the OFM software suite. The course covers each of the required tasks. In accomplishing these tasks the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters. The course also covers graphical display features ranging from tabular plots through line graphs to GIS map-based representations.

COURSE CONTENT

- A brief walkthrough of a fully functioning project
- Review project data and check for missing values
- Use filters to screen out unwanted entities for analysis
- Group project data at multiple levels
- Create calculated fields and calculated variables
- Create single- and multiple-well plots
- Create and format well and field summary reports
- Export reports and table data to other applications

AUDIENCE

Anyone responsible for setting up and maintaining a project using OFM software.

PREREQUISITE

None

Petrel Geology

Foundation – 3 Days

The Petrel platform Geology course consists of two workflows for volumetric calculation; a map-based and a 3D model workflow.

The map-based workflow focuses on the creation of surfaces that delineate the target reservoir. These surfaces, in combination with properties in the form of gridded surfaces or constants, are used to calculate volumes. The 3D model-based workflow focuses on the construction of a 3D grid, populating the grid with properties to be used in determining an accurate volume calculation.

COURSE CONTENT

- Petrel user interface
- Find your data
- Data display in the Well Section window
- Log Editing
- Well correlation
- Isochore and Isopach Processing
- 2D Gridding and Quality Improvement
- Surface Editing and Operations
- Log Property Mapping
- Map-based Volume Calculations

AUDIENCE

Geoscientists, geophysicists, and engineers working on static and dynamic modeling.

PREREQUISITE

Petrel Fundamentals course or similar Petrel platform experience coupled with

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- Material balance
- Economic yardsticks
- Investment choices
- International contracts
- Field examples

AUDIENCE

Petroleum engineers, geologists, reserves analysts, and others involved in estimation of reserves.

PREREQUISITE

Degree in engineering or geoscience, and knowledge of reservoir engineering and petroleum geology.

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Petrel Reservoir Engineering - 3 Day

Foundation – 3 Days

In 3-Day this course, you will build a 3D simulation model inside Petrel based on a geological input data, add wells and well control rules, create black oil fluid models and rock physics functions and submit the model to the simulators.

COURSE CONTENT

- Set up simulation case in Petrel
- Initialization and Volume Calculation
- Simulation Run and viewing Results
- History Matching and Prediction
- Simulation study exercise

AUDIENCE

Development and exploration petroleum engineers, reservoir engineers and geoscientists.

PREREQUISITE

General knowledge of reservoir engineering, and/or petroleum geology, geophysics.

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Project Risk Analysis and Management

Advanced – 4 Days

Uncertainty is inherent in all projects and operations, particularly in technical, financial, schedule, legal, and quality arenas. This course presents the attendees with techniques used in the identification, assessment, and control of uncertainties in a project-based enterprise. Attendees will learn about risk analysis and management as a field of expertise focused on the systematic and comprehensive analysis of uncertainty.

COURSE CONTENT

- Risk analysis process and stages of risk life cycle
- Exposure, impact, and probability assessment
- Risk identification process
- Mitigation strategies
- Using Microsoft Excel and @Risk™ for project risk analysis
- Case study analysis: Resetting probability parameters

AUDIENCE

Anyone wanting to increase skills in project risk management.

PREREQUISITE

Understanding of project planning, monitoring, and control, as well as a basic comprehension of MS Excel and Project.

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a general knowledge of petroleum geology and geophysics as well as elemental software skills.

**ECLIPSE Blackoil Reservoir Simulation**

**Foundation – 5 Days**

The focus of this course is on learning the ECLIPSE Blackoil reservoir simulation software, rather than simulation methodology. This fully implicit, three-phase, 3D, general-purpose blackoil simulator includes several advanced features of ECLIPSE simulator software.

**COURSE CONTENT**

- Overview of how a simulator initializes and executes
- Block-centered and corner-point grid geometries
- Rock and fluid properties
- Allocation of initial pressure and saturation distribution
- Aquifer definition
- Control wells under history-matching and production regime
- ECLIPSE Blackoil file structure
- Input rules
- Specifying and editing input and output data
- Building and executing a simulation model
- Analysis of results through postprocessing

**AUDIENCE**

Reservoir engineers, geoscientists, and other technically trained individuals interested in learning the ECLIPSE Blackoil simulator.

**PREREQUISITE**

ECLIPSE Applied Reservoir Simulation Fundamentals course and background in reservoir engineering.

**MEPO Introduction**

**Foundation – 3 Days**

This course is designed to introduce the application of the MEPO optimizer to reservoir engineers and asset teams involved with related disciplines. The course will cover workflow processes for several concrete application scenarios using industry standard design and optimization techniques in reservoir simulation. Following an introduction to the basic functionality of the tool and project structure, the course attendees will be given a brief summary of terminology and concepts in uncertainty modeling, assisted history-matching, and production forecasting, followed by presentation and hands-on experience gained by working with the application of the MEPO optimizer. Practical exercises include performing uncertainty analyses as well as investigating the influence of various parameters on reservoir modeling and alternative development strategies. The remainder of the course is dedicated to principles and practice of MEPO with a focus on history-matching tasks and uncertainty quantification. Significant emphasis will be placed on design, execution, and postprocessing of reservoir simulation runs. Using carefully selected example cases and exercises, the attendees will gain an understanding of methods and modeling techniques that will enable them to make use of the MEPO optimizer in their routine tasks.

**COURSE CONTENT**

- Introduction to MEPO optimizer
- Introduction to dynamic uncertainty quantification
- Experimental designs
- Analyzing features
- Introduction to optimization methods for history matching and reservoir optimization
- General understanding of the use of MEPO optimizer

**Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course**

**Foundation – 3 Days**

Attendees in this course will explore the functionality of Merak Peep software and decline analysis module. These software packages allow for navigating efficiently through the case document, edit existing data, and analyze economic runs.

**COURSE CONTENT**

**Merak Peep Fundamentals**

- Create, edit, and copy economic case documents
- Review essential economic inputs
- Create filters and user parameters to easily sort large data volumes
- Use batch processes to edit or report multiple cases simultaneously and calculate price sensitivity

**Merak Peep Decline Fundamentals**

- Maintain current in-house and vendor data to understand production levels
- Import and export production history
- Create groups and summary wells to better manage well data
- Forecast production rates and volumes
- Perform basic decline analysis-rate/time curves and cumulative curves

**OFM Fundamentals Using Gas Operations Examples**

**Foundation – 2 Days**

This course introduces attendees to the primary functionalities of the OFM software by allowing the attendees to interact with a preprepared gas well operations project. The flow of the course centers on the attendee acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks using the OFM software suite. The course covers each of the required tasks. In accomplishing the tasks, the attendees are exposed to the range of common features of the software application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project application. During the course, the attendees will learn how to use the OFM software as a quality assurance tool, seeking deficiencies in the data before using the project data to illustrate primary and derived performance parameters. The course also covers graphical display features, ranging from tabular plots through line graphs to GIS map-based representations.

**COURSE CONTENT**

- Brief walkthrough of a fully functioning project to provide quick set of reference points
- Review project data and check for missing values
- Use filters to screen out unwanted entities for analysis
- Group project data at multiple levels
- Create calculated fields and calculated variables
**COURSE OFFERINGS**

- Create single- and multiple-well plots
- Create and format well and field summary reports
- Export reports and table data to other applications

**AUDIENCE**

Anyone responsible for setting up and maintaining a project using OFM software.

**PREREQUISITE**

None

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**Petrel Velocity Modeling**

**Skill – 3 Days**

This course introduces the attendee to velocity modeling, velocity handling, and domain conversion functionality in the Petrel 2013 platform.

The course takes the attendee through the preparation stage of data used for velocity estimation and modeling. This preparation stage includes quality control and editing of checkshot data used in sonic calibration and quality control of time surfaces and well tops used for defining velocity intervals.

Furthermore, the available velocity modeling techniques are presented, including well velocity estimation, the nature and modeling of seismic velocities, surface-based and 3D grid-based seismic velocity modeling, as well as user-defined velocity functions.

Following the velocity modeling phase, domain conversion of various objects and methods for modeling structural uncertainty are covered.

**COURSE CONTENT**

- Quality control of and editing of well data
- Checkshot calibration of sonic logs
- Velocity functions and various velocity modeling approaches
- Velocity modeling quality control and modeling
- Depth error analysis and correction
- Surface-based and 3D grid-based seismic velocity modeling
- Anisotropy in seismic velocities
- Geostatistical methods
- Quantifying residual depth error and creating a depth correction model
- Creating user-defined velocity functions
- Domain conversion
- Modeling structural uncertainty

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers, managers, reservoir engineers and technical personnel experienced with Petrel platform.

**PREREQUISITE**

Petrel Geophysics course or similar Petrel experience.

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**Petrel Reservoir Engineering course or equivalent Petrel experience**

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**Petrel Structural Modeling**

**Skill – 4 Days**

The Petrel 2015 Structural Modeling course presents different approaches to building models that capture geologically complex situations, such as reverse faults and truncations.

The Structural Modeling course presents the flexibility of Petrel and the different approaches that enable you to build 3D models ready for simulation.

The first part of the course demonstrates the real power of Petrel in building watertight frameworks of structurally and stratigraphically complex regions using the new Volume Based Modeling functionality. It is also demonstrates the robust Fault modeling while interpreting seismic functionality which allows rapid real-time creation of the Structural framework, placing the geophysical interpretation at the core of good model building.

**COURSE CONTENT**

- Introduction to Modeling
- Structural framework
  - The Concept of Volume Based Modeling
  - Generate the Fault framework
  - Fault framework while interpreting
  - Boundary definition and Horizon modeling
  - Horizon filtering attribute
  - Refine and create zone model
  - Troubleshooting
  - Depospace
  - Structural gridding
    - Corner Point Gridding
      - Data preparation
      - Modeling of main faults
      - Pillar gridding
      - Make horizons
      - Truncations
      - Reverse faults
      - Modeling salt diapirs
    - Tools for model optimization

**AUDIENCE**

Development and exploration geologists, geophysicists, petroleum engineers,
This course builds on the Petrel platform reservoir engineering course and is an extension of the well modeling environment within the Petrel platform software suite. The course provides support for existing reservoir engineering workflows such as development strategy and field management. Two main production workflows are discussed in the course: performance table collection and nodal analysis simulation. Attendees will learn how to use reservoir simulated variables as input data for creating performance tables and running a nodal analysis case. The integration of production simulated variables to support reservoir engineering workflows will be demonstrated by creating performance tables (VFP) within the Petrel platform suite and associating the results with the development strategy process. In this way, an integrated reservoir-production engineering cycle is completed without leaving the Petrel environment. The attendees will also learn how to use nodal analysis simulation to introduce several inflow performance relationship models for pressure and temperature traverse. When running the nodal analysis case, attendees will learn how to create profile plots, such as liquid holdup, erosional velocity ratio, fluid mean velocity, and so forth.

**COURSE CONTENT**
- Well deliverability module
- Inflow performance relationship (IPR) model manager and supported flow correlations.
- Petrel platform well model optimization by creating a single flow path model
- IPR model manager
- Fluid properties for better understanding of input data
- Hydraulic tables (VFP tables)
- VFP tables associated with a development strategy
- Nodal analysis case and display nodal charts
- Profile spreadsheets and derived logs generated from nodal analysis through Petrel platform
- Well models importing from

**AUDIENCE**
Development and exploration geologists, geophysicists, geochemists, petroleum engineers, managers, reservoir engineers, and other technical staff.

**PREREQUISITE**
Petrel Fundamentals course in addition to Petrel Reservoir Engineering course or equivalent experience.

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**Petrel Property Modeling**

**Skill – 3 Days**

This course focuses on the fundamentals of modeling using the Petrel platform. The course covers basic geostatistical, data preparation, data analysis, facies, and petrophysical modeling. Attendees will learn different ways to create property models and how to condition models to existing models and secondary data. This course guides the user through concepts, algorithms, and software functionalities in property modeling.

The first portion of the course focuses on the use of basic geostatistical tools through data analysis. Also, premodeling processes concerned with well data preparation will be covered, the first step of which is the property modeling workflow followed by upscaling well logs to create single-property values at the well location for each cell. This technique creates hard data that will be used to populate the 3D grid with either deterministic or stochastic algorithms. The second half of the course focuses on facies and petrophysical modeling workflows using stochastic methods as well as covering the usage of kriging for continuous properties. Implementing data analysis results and using secondary data to constrain the result will also be shown.

**COURSE CONTENT**
- Basics of uni- and bivariate geostatistics
- Data preparation, including well log edits, calculations, and upscaling for discrete and continuous data
- Facies modeling
  - Data analysis
  - Sequential indicator simulation
  - Object facies modeling
- Petrophysical modeling
  - Data analysis
  - Sequential Gaussian simulation
  - Gaussian random function simulation
  - Kriging
  - Using secondary data to populate facies models
- Petrophysical modeling
  - Data analysis
  - Using secondary data to populate petrophysical models

**AUDIENCE**
Development and exploration geologists, geophysicists, geochemists, petrophysicists, petroleum engineers, managers, reservoir engineers, and technical personnel with prior experience in using Petrel platform software.

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**PIPESIM Gas Field Production Operation**

**Skill – 2 Days**

This course illustrates the use of the PIPESIM* steady-state multiphase simulator for designing and modeling the operations of gas production systems. Practical and comprehensive problems will be discussed and analyzed throughout the course.

**COURSE CONTENT**
- Navigating the PIPESIM simulator user interface
- Size flowlines and surface equipment
- Troubleshooting and debottlenecking network models
- Modeling gas wells, including various completion models
- Matching inflow performance to test data
- Modeling water separation and injection into a saltwater disposal well
- Modeling sources representing wellhead or manifold production
- Constructing a compositional fluid model
- Predicting gas hydrate formation
- Predicting erosion and corrosion
- Predicting liquid loading in gas wells
- Modeling centrifugal and reciprocating gas compressors
- Comparison of the relative benefits of push versus pull compression
- Estimating the required slug catcher size
- Modeling a transmission network
Petrel Well Design

Skill – 3 Days

This course is designed specifically for SIS drilling support to learn the well planning fundamentals and Petrel drilling workflows.

There are four main topics: offset well analysis, well design; well positioning and real-time operation.

The attendee is guided through the preparation stage for data used in well design. This includes project setup, data import and preparation. You will learn how to import trajectory and targets from third-party applications, such as EDM.

COURSE CONTENT

- Petrel platform introduction
- Petrel interface and windows
- Set units and CRS for a new project;
- Import well head, trajectory, well logs, well tops and image;
- Display data in 2D and 3D windows;
- Creating well section window;
- Objects spreadsheets and settings.
- Create well plan using Well plan designer;
- Create well plan from Template;
- Modify well plan using Well plan designer, dragger, and Inspector;
- Convert proposed wells to advanced plans
- Create well plan report;
- Create well plan using Well plan designer;
- Create well plan from Template;
- Modify well plan using Well plan designer, dragger, and Inspector;
- Convert proposed wells to advanced plans
- Create well plan report;
- Trajectory uncertainty;
- Driller’s target;
- Anti-collision;
- No-go zone;
- Create anti-collision report.
- Import offset well data using indexed EDM files;
- Import drilling events;
- create drilling risk and manage risks;
- Import and display BHAs.
- Introduce real-time data handling in Petrel
- Making scaled map view for well plan;
- Generate vertical section for plan;
- Making scaled vertical view for well plan.

AUDIENCE

Production engineers, facilities engineers, field production operations engineers

PREREQUISITE

General knowledge of petroleum engineering and software skills

INTERSECT Reservoir Simulation

Skill – 3 Days

The INTERSECT Reservoir Simulation course introduces reservoir engineers to methods of constructing simulation models using INTERSECT. The training discusses the main features of INTERSECT relative to working with Petrel or the ECLIPSE reservoir simulator. Along the way, users will also become acquainted with the basic features of the INTERSECT simulator. The course incorporates information about using Petrel pre- and post-processors as the primary front-end for the INTERSECT simulator.

COURSE CONTENT

- Overview of Reservoir Simulation with INTERSECT
- The Petrel RE Workflow
- The Migrator Workflow
- The INTERSECT File Structure
- The INTERSECT Input Format (IXF)
- Field Management Concepts
- Field Management Applications
- Field Management with the Petrel User Interface
- Reports
- Differences Between INTERSECT and ECLIPSE
- Simulator Performance Improvements

AUDIENCE

Reservoir engineers working on simulation studies

PREREQUISITE

Petrel Fundamentals course.
In addition some basic knowledge of well design and drilling is recommended

Integrated Asset Modeler Fundamentals

Skill – 5 Days

This course is based on Integrated Asset Modeler (IAM) 2013 release. This course demonstrates the primary functionalities of IAM for integrated asset modeling studies. It covers coupling model procedures for reservoir to network, network to surface and reservoir, network to economic model including the composition management between models.

The course covers a brief introduction to IAM utilities like variable sensitivity, and optimizer.

COURSE CONTENT

- Couple reservoirs to networks
- Run time-based simulations
- Connect models
- Add a Microsoft Excel model to a flow diagram
- Transfer compositions
- Learn key reservoir network coupling fundamentals
- Create Asset Management Strategies
- Perform Optimization studies
- Evaluate economics with Merak Peep models

AUDIENCE

Reservoir engineers working on simulation studies
PREREQUISITE
Reservoir engineering.

Techlog for Geologists
Advanced – 5 Days

In this course, attendees learn advanced interpretation and processing capabilities with a focus on the management of wellbore image data and the performance of interpretation workflows for analysis of these data. Topics include facies typing using neural network methods, multiwell plotting, cross section building, and mapping in the Techlog software platform application. Learn to use Techlog platform geologic tools to achieve efficient data integration.

COURSE CONTENT
• Load, process, and manipulate image data and core photos
• Pick dips and facies
• Interpret dips and facies
• Neural network techniques for facies prediction
• Use zone editing for field maps, kriging, and multiwell cross sections

AUDIENCE
Development and exploration geologists with prior experience using the Techlog software platform.

PREREQUISITE
Techlog Fundamentals course.
Unconventional Resources

NEXT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>Coal Seam Gas</th>
<th>Tight Gas</th>
<th>Shale Gas - Shale Oil</th>
<th>Heavy Oil</th>
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<td>FOUNDATION</td>
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<td>Fundamentals of Coal Seam Gas (CSG) Development</td>
<td>Analysis and Development of Tight Gas Reservoirs</td>
<td>Rapid Field Development Planning of a Shale play</td>
<td>Heavy Oil Exploitation</td>
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<td>Introduction to the Geology of Coalbed Methane</td>
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<td>SKILL</td>
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<td>Geomechanics Applications in Coal-Bed Methane</td>
<td>Geomechanics Applications in Heavy Oil</td>
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<td>Characterisation and Petrel* 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky</td>
<td>Microseismic Imaging and Hydraulic Fracturing</td>
<td>Completions and Stimulation Aspects of Shale Plays</td>
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<td>Reservoir Engineering Aspects of Shale plays</td>
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<td>Well Architecture and Drilling in Shale Plays</td>
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<td>Water Management Aspects of Shale Plays</td>
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<td>Petrophysics Aspects of Shale Gas</td>
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<td>Shale Oil Fundamentals</td>
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<td>ADVANCED</td>
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<td>Unconventional Gas Reservoirs - Focus on Coalbed Methane and Introduction to Shale and Tight Sand Reservoirs</td>
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<td>Petroleum Systems and Exploration and Development Geochemistry</td>
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<td>Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements</td>
<td>Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane</td>
<td>Shale Plays Production - Exploiting Production Sweet Spots</td>
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<td>Shale Plays Evaluation - Finding Production Sweet Spots</td>
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<tr>
<td>SOFTWARE</td>
<td>Software</td>
<td>Field trips</td>
<td>Includes practical sessions</td>
<td>Uses simulation</td>
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Unconventional Resources

NExT's curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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<td>COMPETENCY LEVEL</td>
<td>SOFTWARE</td>
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<td>Petrel</td>
<td>Mangrove</td>
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<tr>
<td>ADVANCED</td>
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<td>Mangrove Hydraulic Fracture Design Software</td>
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<tr>
<td>SKILL</td>
<td>Petrel Reservoir Geomechanics</td>
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Basics of Shale Prospects

Awareness – 1 Day

Due to increasing global demand for clean hydrocarbons, the E&P companies are in search of unconventional resources. These unconventional resources include hydrocarbons recovered directly from organic rich shales. The approach required to economically extract oil and gas from shales is different as compared to conventional reservoirs and is continuously being evolved and improved. What started as an experiment more than three decades ago promises to be a major source of energy for decades to come.

COURSE CONTENT

- A North American Success Story
- International Growth Potential
- Geology – What’s different?
- Geomechanics – What’s different?
- Well Engineering – What’s different?
- Drilling & Completions Operations – What’s different?
- Production Management – What’s different?
- Exploration, Appraisal & Development Frame Work – What’s different?
- Drilling
- Evaluation
- Completion
- Software
- Early Exploration
- Drilling Performance Improvement
- Well Performance Improvement
- Social & Environmental Sustainability

AUDIENCE


PREREQUISITE

Basic knowledge of E&P Oil and Gas Industry

Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources

Foundation – 5 Days

This 5-Day course will show how geochemistry and petroleum system modeling can reduce exploration risk for conventional and unconventional (e.g., shale-gas or shale-oil) resources. Lectures will show how forward deterministic computer models use geohistory analysis, boundary conditions, and chemical reaction kinetics to predict the timing of petroleum generation, molecular composition, and extent of overpressure. Factors controlling “sweet spots” will be discussed, including the influence of geomechanics on rock fracturing and producibility and the extent of primary or secondary cracking based on biomarkers, isotope “rollover”, and diamondoids. Discussions will provide guidelines for sample collection and project initiation, how to evaluate prospective source rocks, and how to define petroleum systems through oil-source rock correlation. Participants will learn how to calibrate petroleum system models using data from wells, such as pressure, corrected bottom-hole temperature, and vitrinite reflectance.

COURSE CONTENT

- The Dynamic Petroleum System Concept
- Introduction to 1D, 2D, 3D basin and petroleum system modeling
- Petroleum system folio sheet
- Timing of petroleum system events and processes
- The Alaska North Slope 3D model
- Fundamentals of Model Input
- Thermal maturation and vitrinite reflectance
- TOC, Rock-Eval pyrolysis, geochemical logs
- Fractional conversion, original TOC, expelled petroleum, expulsion efficiency
- Boundary Conditions and Geohistory Analysis
- Boundary conditions: paleowater depth, sediment-water interface temperature, heat flow
- Geohistory analysis: pore pressure, compaction, tectonics
- Fundamentals of Kinetics and Model Calibration
- Chemical reaction kinetics
- Model calibration and risk analysis
- PVT analysis
- Unconventionals, Case Studies, and Conclusions
- Modeling unconventional resources
- Case studies
- Review and conclusions
- Practical exam

AUDIENCE

This course is intended for oil and gas professionals who want an overview of Geochemistry and Petroleum System Modeling. It is suitable for exploration, production, and development geologists.

PREREQUISITE

A basic knowledge of chemistry and geology.

Shale Reservoirs - Applied Core Analysis

Foundation – 5 Days

The objective of an integrated core analysis program is to evaluate the two most fundamental requirements for successful production from unconventional gas reservoirs: reservoir quality and completion quality. Unconventional gas reservoirs are heterogeneous and strongly anisotropic. It is important to develop a model that can deal with this variability and provide useful information for the preparation of a field development strategy. Analyses of organic-rich mudstone cores can provide valuable information in understanding the quality of the reservoir and provide critical input to the completion design. This 5-day course provides attendees with an integrated workflow to assess unconventional resources through core analysis. Participants will be exposed to specialized core measurement techniques required to assess reservoir and completion quality in these formations.

COURSE CONTENT

- Geology and petrology for unconventional resources
- Laboratory techniques employed during petrologic evaluation
- Composition and texture, organic maturity, and shale diagenesis
- Laboratory hands-on session
Introduction to the Geology of Coalbed Methane

Foundation – 3 Days

This course reviews (1) CBM origins, (2) controls on CBM occurrence and production, (3) methods of assessing CBM resources and producibility in various geologic settings, (4) controls on coalbed gas composition, (5) influences on permeability and production rates, (6) hydrologic issues and water production, and (7) methods of drilling, completing, and stimulating CBM wells. In the US, CBM accounts for approximately 10% of both natural gas production and reserves. Internationally, however, CBM plays a much less important role in meeting energy demands, even in countries where coal and CBM are abundant.

Examples from several basins will be presented to clarify controls on CBM occurrence and producibility and to demonstrate the origins of highly productive CBM fairways or sweetspots. The properties of contrasting coalbed gas systems (i.e., thermogenic vs. biogenic system and water-productive and water-free systems) will be described in terms of their origins, gas resources, and CBM play characteristics. Drilling, completion, and stimulation of CBM wells are considerations in relation to geologic controls of best engineering practices. Understanding these factors can facilitate development of CBM resources from diverse physical settings.

COURSE CONTENT

- Coal depositional systems
- Resource delineation questions
- Structural settings
- Maceral types and reservoir fluid composition
- Coalbed gas origins and coal thermal maturity
- Coalbed permeability
- Hydrologic analysis
- Coal tonnage estimating and coalbed gas volumes
- Coalbed gas drilling, completions, and production methods
- Coalbed gas stimulation, and completion advisor
- Water-lift methods for coalbed gas wells

AUDIENCE

Engineers, geoscientists, financial decision makers, and managers concerned with the evaluation of gas shale resources

PREREQUISITE

Engineering or geoscience background

Introduction to Shale Reservoirs

Foundation – 5 Days

This 5-day course provides attendees with focused instruction on the geological, geophysical and petrophysical attributes of shale reservoirs, including the origin and accumulation of natural gas and liquids. Participants will be exposed to the methods and workflows for identifying and characterizing shale reservoirs. They will build on this foundation to learn about the engineering aspects of shale hydrocarbons exploration. Participants will gain an understanding of methods and workflows for developing shale hydrocarbons resources including horizontal well architecture & placement, completions, hydraulic fracturing and production.

COURSE CONTENT

- Geologic Considerations: regional (or basin-wide) structural influences and tectonic considerations and local stratigraphy.
- Exploration Considerations: Reconnaissance methods; objectives and tasks involved in the exploration study; screening and ranking prospects; importance of fractures; use of seismic in the evaluation of shale reservoirs; role of geomechanics; use of basin modeling and petroleum systems analysis; risk analysis and pilot projects
- Formation Evaluation: Wireline Logging; Borehole Imaging; Micro-Seismic Analysis; Wireline formation testing. Using log measurements for determination of mineralogy; porosity (total porosity vs. effective porosity); permeability; free and total gas quantification; adsorbed hydrocarbons quantification; saturation and shale gas integrated with cores. Understanding rock heterogeneity
- Geomechanics - Paleostress; Modern Stress; Near borehole Stress and Wellbore Failure; Mechanical Earth Model (MEM); Thickness, Depth and Pressure; Hydrocarbons Storage Capacity.
- Horizontal Borehole Considerations
- Reservoir Quality Considerations for Borehole Placement: Lateral orientation
- Rig Technologies; Pad Drilling; Drilling Fluids; Bottom Hole Assembly Optimization
- Drainage areas and borehole spacing; Production “Sweet Spots” Economics; Statistical Drilling; Sweet Spot Drilling;
- Completions – Integration process and best practices in designing completions. Topics such as well integrity, casing requirements, cemented or uncemented liners, fracture staging tools and technology, perforating, and artificial lift are presented.
- Fracturing and Fracture Evaluation – Stimulation operations and evaluating completion efficiency. Transverse versus longitudinal fractures, fracture spacing, fracture complexity, job sizing, fluid chemistry and proppant design, risk minimization, and microseismic monitoring. Overview of software applications with field examples
- Water Cycle
- Production Philosophies – production and field redevelopment strategies to maintain production. Tools and workflows for production monitoring and control. Possible Flow Assurance Issues

PREREQUISITE

Basic knowledge of petroleum geology and engineering principles.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
AUDIENCE
Petroleum Engineers, Geoscientists and Managers wanting to gain a good understanding of characterizing and developing Shale reservoirs

PREREQUISITE
Petroleum Engineers and Geoscientists with experience of one year or more in the Oil & Gas industry

Heavy Oil Reservoir Engineering
Foundation – 2 Days

In this 2-day introductory course, participants will learn the reservoir engineering aspects of heavy-oil exploitation. They will be introduced to heavy oil, its sampling, phase behavior and flow assurance. Primary, non-thermal, thermal and newly developed recovery process will also be discussed.

COURSE CONTENT
- What is heavy oil?
- Global heavy oil development
- Economics and drivers
- Industrial trends and challenges
- Overview of recovery processes
- Heavy oil workflow
- Why do we need heavy oil fluid analysis?
- Describing heavy oil
- Sampling
- Phase behavior
- Flow Assurance
- Primary recovery processes
- Non-thermal recovery processes
- Steam-based thermal recovery processes
- Non steam-based thermal recovery processes
- Newly developed recovery processes

AUDIENCE
Engineers, geoscientists, financial decision makers, and managers concerned with the evaluation of gas shale resources

PREREQUISITE
None

Analysis and Development of Tight Gas Reservoirs
Foundation – 5 Days

This 5-Day course will provide participants with an overview of the analysis and development of tight gas reservoirs. This course will cover the evaluation, completion, stimulation, along with the development of tight gas reservoirs. Other topics that will be discussed include geologic characteristics, formation evaluation (log and core analysis, in-situ stress tests, and well tests), estimating reserves and well performance, hydraulic fracture treatment design and execution, and field development considerations.

COURSE CONTENT
- Introduction to tight gas
- Completion methods
- Formation evaluation I
- Statistical correlations
- Formation evaluation II – rock mechanics
- Developing data sets
- Hydraulic fracturing fundamentals
- Post-fracture evaluation
- Completion and stimulation of coal bed methane
- Tight gas sands
- Unconventional reservoirs
- Conventional decline curve analysis
- Advanced decline curve analysis
- Analytical simulation
- Moving domain analysis
- Production data analysis

AUDIENCE
Petroleum engineers with production or operations background.

PREREQUISITE
Petroleum engineer with production/operations background
Rapid Field Development Planning of a Shale play

Foundation – 2 Days

The objective of this 2-Day training is to provide participants a practical exposure to a Rapid FDP process. Participants will be working in teams of 2 or 3 to prepare an FDP for a given shale play considering sweet spot maps, surface restrictions, lateral spacing, orientation, pad configurations, type curves & stimulation options.

COURSE CONTENT

- Introduction to Shales (North American Success story and International Growth potential)
- Introduction to FDP; Need for & benefits of a Rapid FDP for shale plays
- Introduction to Well Engineering for shales- What is different in drilling shale wells?
- Introduction to Pad Placement in Petrel
- Practical Session: Optimum Pad Placement
- Introduction to Pad Well Design in Petrel
- Practical Session: Optimum Pad Well Designs
- Production forecasting using Type Curves
- Introduction to RapidPlan FDP application
- Practical session: Generate & optimize FDP scenarios
- Practical Session: Analysis of FDP results
- Brief introduction to other FDP options available in RapidPlan

AUDIENCE

Geoscientists & Petroleum Engineers interested in getting a practical exposure to the Rapid FDP process for Shales.

PREREQUISITE

Knowledge of Petrel software or attend a Petrel Fundamentals training

Shale Oil Fundamentals

Skill – 3 Days

This course is designed to cover the typical workflow performed during the exploration, development, and exploitation of a shale reservoir play. The attendee will learn about the integration of disciplines important in studying shales. This workflow has been developed based on experience in multiple shale plays in North America and will be referred to as the “Shale Operating Cycle.” This cycle is composed of the following phases: the exploration phase, pilot project phase, appraisal phase, factory mode phase, and reassessment phase. The ultimate goal of the investigation into each shale reservoir is to develop an understanding of the geologic factors that control production from the shale reservoir and then determine the best methods for producing them.

COURSE CONTENT

- Unconventional reservoirs overview
- Shale basics
- Geoscience, geochemical, and geomechanical considerations
- Shale exploration projects and considerations
- Reconnaissance methods
- Screening and ranking shale plays
- Mineralogy, porosity, and permeability determination
- Reservoir evaluation tools
- Fracture characterization, prediction, and detection methods
- Hydraulic fracturing, horizontal borehole, lateral landing, completion, and environmental considerations

AUDIENCE

Geoscientists, engineers, and managers wishing to know about shale oil exploration and development.

PREREQUISITE

None

Heavy Oil Exploitation

Foundation – 5 Days

This foundation course covers the full E&P life cycle with major focus on the challenges in exploitation. The course introduces attendees to the applications of various key technologies and their appropriate interpretations along with systematic workflows and field examples. Attendees will learn ways to reduce the lifting cost and make heavy oil more economically viable assets.

COURSE CONTENT

- Heavy oils: Definition, geologic features, technologies and workflows for sampling and phase behavior characterization, and production challenges
- Recovery methodologies: Nonthermal and thermal, toe-to-heel air injection with and without solid catalyst, and steam-solvent-based hybrid processes
- Nonthermal and thermal simulation processes
- Completions types and requirements for thermal recovery processes, sand control and management techniques
- Production techniques and lift methods
- Surface processing and upgrading schemes, transportation methodologies, storage practices

AUDIENCE

Multidisciplinary asset team members, including geologists, geophysicists, asset managers, and reservoir, drilling, production, completion, and facilities engineers.

PREREQUISITE

Bachelor’s degree in engineering or geosciences.

Geomechanics Applications in Shale Gas

Skill – 2 Days

This course presents the fundamentals of geomechanics as they apply to exploitation of shale gas reservoirs. The course combines theoretical, laboratory (core testing), and field aspects, resulting in a consolidated approach to understanding the optimal methodologies and technologies for efficient recovery of these resources. Field examples from unconventional reservoirs reinforce the attendee’s understanding of these fundamentals and their applications.

COURSE CONTENT

- Fundamentals of geomechanics in unconventional reservoirs
- Shale heterogeneity evaluation
- Review of workflows using geomechanics principles
- Design of data-acquisition programs for effective geomechanics analyses
- Workflows for estimation of anisotropic parameters using acoustic azimuthal anisotropy

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
**IMMERSIVE LEARNING PROGRAMS**

**COMPETENCY MANAGEMENT**

- Mechanical earth models and tight rock analyses
- Key geomechanical elements affecting hydraulic fracture stimulation design
- Completion

**AUDIENCE**

Engineers, geoscientists, and technologists involved in exploration, drilling, completions, and production in unconventional reservoirs.

**PREREQUISITE**

Bachelor’s degree in engineering or geosciences.

### Petrophysics Aspects of Shale Gas

**Skill – 5 Days**

This 5-Day course provides a general introduction to the use of well logs to evaluate organic shale reservoirs. Primary focus will be on estimating basic components of reservoir quality—TOC, primary mineralogy, porosity, saturation, permeability, hydrocarbon in place. Additional focus will be on estimating basic components of completion quality—minimum horizontal stress for isotropic and anisotropic systems. The combination of the two criteria will be used to identify, qualify and pick a lateral landing point for an organic shale.

**COURSE CONTENT**

- Definition of productive organic shale reservoir
- TOC/Kerogen identification and quantification
- Adsorbed gas quantification using Langmuir isotherm
- Quantification of mineralogy through log evaluation and relationship to productivity
- Porosity—effective vs. total and their estimation
- Hydrocarbon saturation calculation and accounting for clay water
- Estimation of pore gas hydrocarbon with adsorption correction
- Delineation of shale gas beds and identification of potential pay
- Determination of stress for completion design
- Estimation of producibility based on porosity, permeability, fractures, pressure etc.
- Determination of lateral landing points using stress profiles and rock quality

**AUDIENCE**

Engineers and Geoscientists

**PREREQUISITE**

None

### Water Management Aspects of Shale Plays

**Skill – 5 Days**

Shale reservoirs are known to have low matrix permeability, and gas production in commercial quantities requires fractures to provide permeability. Hydraulic fracturing requires use of large amounts of water along with chemicals in small amounts to facilitate the fracturing process. Some portion of the frac fluid will return to the surface as produced water, potentially contaminated. This 5-day course provides participants with a good overview of water management and treatment design, including topics on sourcing, transportation, storage, treatment technologies, disposal, and the regulatory framework. This is a practical training class in which analytical techniques will be taught with a hands-on approach utilizing current methodologies and instrumentation in a full-scale teaching laboratory working with actual oil and gas waters from various shale plays. Sample collection, sample preparation, and laboratory skills will be emphasized, and participants will be able to enhance their knowledge of methodologies.

**COURSE CONTENT**

- Produced water’s history and market overview
- Water cycle
- Water chemistry
- Lab work: water chemistry analyses and lab instrumentation
- Frac fluid compatibility
- Produced water treatment technologies
- Water quality by shale plays
- Lab work: laboratory observations of various produced waters
- Produced water’s history and market overview
- Water cycle
- Water chemistry
- Lab work: water chemistry analyses and lab instrumentation
- Frac fluid compatibility
- Produced water treatment technologies
- Water quality by shale plays
- Lab work: laboratory observations of various produced waters
- Water transport and storage
- Blending/minimalist approach
- Water treatment process design
- Produced water treatment technologies
- Oil/water separation
- Scaling and cation/anion removal
- Dissolved solids
- Select constituent removal
- Sample collection and preparation
- Solids
- Inorganics
- Organics
- Bacteria
- Laboratory techniques
- Regulatory framework and air emissions
- Data management
- Types of facilities
- Practical session: water treatment design and field trial planning

**AUDIENCE**

Engineers actively engaged in unconventional stimulation design and execution operations; geoscientists and managers in unconventional resources development such as shale or tight gas/ oil

**PREREQUISITE**

Engineering degree with 2 to 3 years of working experience in the oil and gas industry

### Well Architecture and Drilling in Shale Plays

**Skill – 5 Days**

This 5-Day course is designed to increase understanding of the essential aspects of well architecture and drilling in unconventional resource plays to enable asset team members to make better field development decisions. The course covers some high-angle lateral well issues and ties drilling mechanics to the geoscience covered in previous weeks. It also covers the necessary fundamentals of well architecture and drilling in shale plays. The class includes: best practices in survey and anti-collision; well design and pad drilling; overview of motors and rotary steerable systems; geosteering, MWD systems, and key LWD tools for unconventional

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**Software**

Technical courses that use software

**Field trips**

Includes practical sessions

**Uses simulation**
lateral wells, BHA design and components, bit selection and optimization and drilling fluids; and hydraulics, hole cleaning, wellbore integrity, torque and drag. Throughout the course, field examples and practical aspects will be used to reinforce the learning experience.

**Course Content**

- Surveys: concept of spatial relationship through accelerometers, magnetometers, and gyro; environmental issues caused by magnetic field variations, metals, etc.; capturing and validating static surveys; understanding EOU and traveling cylinder plots, and anticollision practices.
- Well design and pad drilling: considerations in well design, from lease line constraints to fracture wing length to dogleg capabilities of tools; and pad drilling
- MWD, LWD in lateral wells
- Overview of motors and rotary steerable systems
- Drilling mechanics and hydraulics

**Audience**

Engineers and geoscientists interested in Shale Gas training

**Prerequisite**

None

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**Reservoir Engineering Aspects of Shale Plays**

**Skill – 5 Days**

This 5-Day course will help the participants understand the essential aspects of reservoir engineering in unconventional resource plays enabling asset team members to make better field development decisions. The course will include topics related to reserves estimation, well testing, fluid evaluation sampling and well and reservoir dynamic modeling.

**Course Content**

- Basic reservoir drive mechanisms
- Production mechanism in oil/gas shales
- Phase behavior for five reservoir fluids
- Rock wettability, relative permeability, capillary pressure
- Fundamentals in pressure transient test and its limitation in shales
- Rate transient in gas shale
- Reserves definitions
- Reserves estimation using volumetric and decline curve analysis in shales
- Limitations of these conventional methods
- Introduction to reservoir simulation
- Model design and calibration
- Production prediction
- Results interpretation
- Characteristics of Shale Simulators
- Production data analysis using reservoir simulation

**Audience**

Engineers and Geoscientists interested in developing competencies in reservoir engineering fundamentals of shale plays.

**Prerequisite**

A basic knowledge of reservoir engineering and petroleum geology.

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**Production Engineering Aspects of Shale Plays**

**Skill – 5 Days**

This 5-Day course will cover the essential of production engineering aspects of shale reservoir, especially how to use production data in analyzing well performance and improving reservoir understanding. From a production engineering perspective, most conventional reservoir methodologies are still relevant; however, they are applied in different ways. Understanding the limitation, advantages and how to adapt each of the methodologies in shale reservoirs is critical to the success of field development.

**Course Content**

- Introduction to Production Fundamentals – In day one, the course will cover the key production mechanisms, inflow and outflow, the concepts of nodal analysis, unconventional system and how they differ from conventional production. Concept of time-lapse nodal analysis will be introduced to extend the traditional nodal analysis workflow to unconventional system.
- Production modeling – In day two, discussion will continue on production modeling, with latest analytical method for production engineering workflows. The concept of rate transient analysis for production interpretation will be introduced, and how it differs from decline curve analysis.
- Production Impairment – The course will then cover production impairment mechanisms, including near-wellbore damage (skin), hydraulic fracture degradation, multiphase problem in the wellbore, slugging, liquid loading, with an introduction of transient flow simulation and how it is different from steady-state simulation. Flow assurance concepts will be introduced too, including scale, waxes, asphaltenes and hydrates.
- Artificial Lift – In day four the course will review the principles of artificial lift methods, with a focus on gas lift and electrical submersible pumps. The concept of artificial lift surveillance and optimization will be introduced, with an ESP case study in the Eagle Ford.
- Production performance analysis of shale reservoirs – On day five, participants will be exposed to techniques used to analyze production performance at different stages of the shale evaluation and development cycle, including moving domain analysis. Production drivers of shale production will be introduced. An overview of US shale plays will be presented, including geology, petrophysics, completion methods, and production characteristics.

**Audience**

Engineers and Geoscientists interested in Shale Gas

**Prerequisite**

None

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**Geomechanics Applications in Coal-Bed Methane**

**Skill – 2 Days**

Geomechanics plays a critical role in optimizing unconventional reservoir exploitation. This 2-Day course provides essential aspects of geomechanics in coalbed methane (CBM), enabling an engineer or geoscientist to make better field development and operational decisions. A unique feature of this course is that it gives a unified geomechanics approach combining theoretical, laboratory (core testing), and field aspects to effective exploitation of unconventional reservoirs. This course covers the necessary fundamentals of geomechanics as applied to coal, cleats, and natural fractures and their influence on drilling, wellbore stability, and stimulation; critical elements in designing coal completions; and geomechanical aspects in CBM-EOR and carbon dioxide sequestration.

**Course Content**

- Fundamentals of geomechanics
- Concept of stress/strain, in situ stresses, and principle of effective stress
COURSE OFFERINGS

IMMERSIVE LEARNING PROGRAMS

COMPETENCY MANAGEMENT

- Computation of mechanical properties and strength parameters from logs
- Rock/coal strength
- Understanding Mohr circle and Mohr-Coulomb criterion for rock failure
- Characteristics of coal
- Characterizing coal structure
- Effect of coal cleats and natural fractures on mechanical properties, strength, and stresses
- Evaluating coal mechanical properties and strength from core data
- Wellbore stability in coal
- Borehole stresses and near-wellbore mechanics
- Mechanics of borehole collapse, sloughing, and lost circulation
- Estimation of safe mud-weight window
- Factors causing wellbore instabilities in coal
- Coal stimulation
- Basics of fracture gradient and hydraulic fracturing in coals
- Overview of common completion techniques in CBM
- Success stories and review of case studies
- Geomechanical aspects in CBM-EOR and CO2 sequestration

AUDIENCE

Engineers, geoscientists, and technologists involved in exploration, drilling, completions, and production in unconventional reservoirs; asset and technical managers

PREREQUISITE

Four-year engineering and geoscience degree

Completions and Stimulation Aspects of Shale Plays

Skill – 5 Days

This 5-Day course will introduce the audience to the engineering methodology of completing organic shale reservoirs. The fundamentals of hydraulic fracturing are reviewed. Designing and completing hydraulically fractured horizontal wells for optimum productivity is the focus of the course. Various measurement techniques to employ in the completion optimization exercise are reviewed. Classroom exercises to select lateral landing points, design perforation strategies, place perforations and design stimulation stages, determine fracturing fluid formulations are employed in order for the student to gain a personal understanding of the impacts of these parameters on stimulation effectiveness.

COURSE CONTENT

- Rock mechanics, fracturing fluids and additives, proppants
- Stress profiles, impact of tectonics, pore pressure
- Modeling of fracture geometries
- Complex fracture geometries, impact of anisotropy
- Justification, design, construction, measurements
- Completion systems, cementing, perforating
- Fracture staging, perforation placement
- Impact of stress anisotropy and natural fractures
- Hydraulic fracture spacing, complexity prediction and modeling

AUDIENCE

Engineers and Geoscientists selected by Saudi Aramco to participate in the Shale Plays training program

Characterisation and Petrel® 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky

Skill – 5 Days

This is a 5-Day field- and classroom-based reservoir geology and modeling course based in Lexington and Prestonsburg, East Kentucky. The course will focus on capturing the geological knowledge necessary to build realistic models of coal-bearing fluvial and deltaic sediment body architecture using Petrel® (E&P software platform). The course follows the typical workflow of a subsurface 3D modeling study and is aimed at fluvio-deltaic reservoir characterization and making realistic predictive models of sedimentary geometries and architecture by incorporating detailed knowledge of sedimentology and sequence stratigraphic concepts. Outcrops, cores, and well logs are studied to characterize both small- and large-scale patterns of sedimentary architecture within a sequence stratigraphic framework in these carboniferous coal-bearing fluvio-deltaic sediments. The course blends instruction at outcrops with corresponding classroom instruction in building 3D models of the same outcrops. Generally, the mornings are spent in the field with afternoon classroom-based modeling sessions. The physical demands for this class are easy according to our field course grading system.

COURSE CONTENT

- Geological setting, upper carboniferous stratigraphy, sedimentology
- Core/log characterization
- Petrel modeling
- Core workshop
- Travel to Prestonsburg
- Overnight at Prestonsburg
- Stop 1: Pikeville Cut-Thru
- Stop 2: Coal Run Village
- Stop 3: Johns Creek
- Stop 4: Ivel
- Stop 5: Raccoon Creek
- Classroom: modeling intro
- Overnight at Prestonsburg
- Stop 6: Sidney 1
- Stop 7: Sidney 2
- Stop 8: Zebulon 2
- Classroom: modeling 1
- Overnight at Prestonsburg
- Stop 9: Burning Fork
- Stop 10: Zebulon 1
- Return travel to Lexington
Microseismic Imaging and Hydraulic Fracturing

Skill – 5 Days

This 5-Day course covers the main concepts of hydraulic fracturing and microseismic imaging. Hydraulic fracturing will be illustrated by numerous examples. For microseismic imaging, the theoretical background of acquisition, processing, and interpretation of the data will be presented, focusing on practical considerations related to executing a successful imaging project. The theoretical basis will be closely tied to key field examples in order to demonstrate specific aspects. Potential interpretation pitfalls will be stressed in terms of data quality, image accuracy, sensitivity, and resolution, as well as fundamental limitations of the data related to geomechanics. Quality control attributes will be presented in order for participants to better understand the data limitations and confidence, especially the potential impact on interpretation. Finally, there will be an overview of advanced processing and future research directions.

COURSE CONTENT
- Fracture modeling and containment
- Fracture containment
- 2D and 3D models
- Microfacture and Minifract testing
- Core testing
- Frac fluids and proppants
- Types and rheology of face fluids
- Additives and leakoff
- Ideal frac proppants
- Proppant flowback
- Frac design, perforating, and postfrac treatments and evaluation
- Steps in frac design
- Preparing and executing fracs
- Postfrac treatments and evaluation
- Theoretical considerations and basic processing
- Theoretical considerations
- Acquisition
- Basic processing
- Fracture interpretation and pitfalls
- Fracture interpretation
- Interpretation pitfalls
- Advanced processing and interpretation

AUDIENCE
Geoscientists interested in characterizing and realistically modeling sedimentary architecture to support hydrocarbon, coalbed methane, or coal extraction

PREREQUISITE
Working knowledge of Petrel

Economics of Unconventional Resources

Skill – 4 Days

During this 4-ay course, participants will learn about the types of unconventional resources and the similarities among tight gas, coalbed methane, and shale gas. The life cycle and key parameters of unconventional plays will be discussed in order for participants to gain an understand of how to model the economic viability of a potential development. This modeling process will incorporate the benefits of the latest industry knowledge of unconventional resource development, such as sweet spot identification, well planning, drilling, and completions, in order to maximize the potential for profitability. Participants will gain an overview of worldwide unconventional activity, the ability to understand best practices for development, and the process for identifying key risks and uncertainties. In addition, a proven process for modeling the economics of unconventional resource development, including decision mapping and decision trees, will be covered. This course uses Excel, but primarily uses the Merak software Peep and Decision Tool Kit.

COURSE CONTENT
- Understanding the unconventional reservoir
- Life cycle of unconventional resources
- Overview of worldwide unconventional resources
- Case studies of North America development
- Development strategies
- Current practices in evaluation and development
- Key technical and business parameters
- Best practices for successful development
- Decision modeling
- Build decision map and decision model
- Understand major impacts on project viability
- Model type well
- Project cash flow and dynamic decision tree
- Understand breakeven price, hurdle rate, and other metrics
- Consider options for development and project modeling
- Project schedules and other parameters

AUDIENCE
Geoscientists, engineers, commercial team members, or managers who need to model and analyze the business impact of unconventional resources

PREREQUISITE
Working knowledge of project economics or a foundation level course in petroleum economics

Geomechanics Applications in Heavy Oil

Skill – 3 Days

Structured to help engineers and geoscientists make informed decisions on development strategies and operations in heavy oil sands, the course material presents the essential geomechanics aspects employed in thermal-based recovery operations. Attendees will learn how to build MEMs and the advantages of coupling geomechanics models with reservoir models. The attendees will also learn about the geomechanical effects that can result from SAGD projects and keep up to date with technologies and tools for monitoring the integrity of the reservoir and the caprock.

AUDIENCE
Geoscientists and engineering personnel involved with the mapping of fracturing operations using microseismic and/or in the planning, execution, and interpretation of microseismic data to image hydraulic fracturing

PREREQUISITE
Basic knowledge of well completions and well intervention operations

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
COURSE CONTENT
- Basic principles of rock mechanics
- In-depth discussion of earth stresses
- Types of rock failures and their causes
- MEMs
- Caprock integrity analysis to assess hydraulic and mechanical integrity
- Workflow for coupled reservoir-geomechanics modeling
- Reservoir monitoring

AUDIENCE
Engineers, geoscientists, and technologists involved in exploration, drilling, completion, and production in unconventional reservoirs; asset and technical managers.

PREREQUISITE
Bachelor’s degree in engineering or geosciences.

Petroleum Systems and Exploration and Development Geochemistry
Advanced – 5 Days

This 5-Day course focuses on the dynamic petroleum system concept, exploration geochemistry of conventional and unconventional petroleum, and reservoir geochemistry. The course is designed for exploration, production, and development geologists. Lectures show how geochemistry can reduce the risk associated with petroleum exploration, how to predict oil quality from inexpensive wellbore measurements, how to identify reservoir compartments and de-convolute commingled petroleum, and how to assess completion problems. It provides interpretive guidelines for sample collection and project initiation, how to evaluate prospective source rocks, and how to define petroleum systems through oil-oil and oil-source rock correlation.

COURSE CONTENT
- Objectives, Terms, Nomenclature
- Petroleum System Folio Sheet: Map and Cross Section at Critical Moment, Table of Accumulations, Event Chart, Burial History Chart
- Timing of Petroleum System Events and Processes
- Introduction to Basin and Petroleum System Models
- Origin and Preservation of Sedimentary Organic Matter
- Project Initiation and Sample Collection, Exercises
- Vitrinite Reflectance: Thermal Maturity, Calibration, Kinetics
- TOC, Rock-Eval Pyrolysis, Geochemical Logs
- Fractional Conversion, Original TOC, Expelled Petroleum, Expulsion Efficiency
- Interpretive Pitfalls; Exercises
- Gas Chromatography, Stable Isotopes, Surface Geochemical Exploration
- Semivariograms and Spatial Significance of Data
- Biomarker Separation and Analysis
- Source- and Age-Related Parameters, Introduction to Oil-Oil and Oil-Source Rock Correlation
- Interpretive Pitfalls; Exercises
- Thermal Maturity Parameters; Cracking, Thermochemical Sulfate Reduction
- Biodegradation Parameters

AUDIENCE
Geoscientists needing knowledge of Petroleum Systems, Petroleum Geochemistry and Basin Modeling

PREREQUISITE
Knowledge of Basic Petroleum Geology and Petroleum Systems

Unconventional Gas Reservoirs - Focus on Coalbed Methane and Introduction to Shale and Tight Sand Reservoirs
Advanced – 5 Days

This course, with its emphasis on coalbed methane reservoirs and overview of shale gas and tight gas sand reservoirs, covers the critical aspects of these three unconventional resources. Attendees will learn the role that natural fractures play in fluid flow from these typically low-permeability formations in addition to learning the optimal drilling, completion, and stimulation practices for production from these reservoirs.

COURSE CONTENT
- Unconventional gas: Origins in self-sourcing reservoirs, thermal maturation, and hydrocarbon generation
- Thermogenic versus biogenic self-sourcing gas reservoirs, controls on gas occurrence and producibility
- Role of natural fractures in unconventional gas production, review of hydrology role in water production and management
- Drilling, completion, and stimulation practices with a focus on mature US basins
- Examples of mature unconventional gas plays around the world
**Shale Plays Evaluation - Finding Production Sweet Spots**

**Advanced – 4 Days**

Shale gas reservoirs have distinct characteristics that require specific evaluation techniques. In this course, attendees will learn the geologic, geophysical, and petrophysical attributes of these reservoirs, including the origin and accumulation of the natural gas. The attendees will gain exposure to the methods and workflows for identifying, characterizing, and developing shale gas reservoirs. Instruction includes field examples that deliver a foundation for understanding the exploration, appraisal, and location of production sweet spots for development. Course exercises demonstrate how to assess economic viability of assets.

**COURSE CONTENT**

- Unconventional versus conventional reservoirs
- Geologic, geochemical, and geomechanical considerations in exploitation
- Role of geomechanics in basin modeling, petroleum systems analysis, and risk assessment
- Development of MEMs, including thickness, depth, pressure, and gas storage capacity
- Formation evaluation methodologies: Mineralogy, porosity, permeability, free and total gas quantification, adsorbed gas
- Correlation of wireline logs, borehole images, microseismic analysis, and wireline formation tests
- In situ permeability and determination of permeability anisotropy
- Calculations of gas in place
- Key criteria governing wellbore placement, including drainage areas and borehole spacing
- Penetration of production sweet spots and their economics
- Statistical drilling and sweet spot drilling

**AUDIENCE**

Operating company multidisciplinary asset team members, engineers, geoscientists, financial decision-makers, and resource managers.

**PREREQUISITE**

Bachelor’s degree in geosciences.

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**Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane**

**Advanced – 3 Days**

This course is designed to implement a comprehensive learning module of production data interpretation and analysis, including the principles of production fundamentals, technologies, and workflows with applications and field examples for unconventional resources. Production analysis requires handling and conditioning large volumes of multiple source, multiple frequency data, identifying and synchronizing events, and assigning the appropriate production rate to each event. These critical steps enable production engineers to make efficient interpretation and analysis of the data and to optimize well productivity using advanced methodologies.

**COURSE CONTENT**

- Science: Foundational understanding of principles and governing factors of production
- Technologies: Exposure to sensor technologies and tools necessary for data conditioning
- Workflows: Skills to apply methodologies and workflows to enable data interpretation and analysis

**AUDIENCE**

Practicing reservoir, production, and facilities engineers and engineering and asset managers.

**PREREQUISITE**

4-year geoscience/engineering degree.

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**Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements**

**Advanced – 5 Days**

Rock Physics is a key component in oil and gas exploration, development, and production. It combines concepts and principles from geology, geophysics, petrophysics, applied mathematics, and other disciplines. Rock physics provides the empirical relationships, understanding and theory to connect petrophysical, geomechanical and seismic data to the intrinsic properties of rocks, such as mineralogy, porosity, pore shapes, pore fluids, pore pressures, stresses and overall architecture, such as laminations and fractures. Rock physics is needed to optimize all imaging and reservoir characterization solutions based on geophysical data, and to such data to build mechanical earth models for solving geomechanical problems. Attendees will obtain an understanding of the sensitivity of elastic waves in the earth to mineralogy, porosity, pore shapes, pore fluids, pore pressures, stresses,
and the anisotropy of the rock fabric resulting from the depositional and stress history of the rock, and how to use this understanding in quantitative interpretation of seismic data and in the construction of mechanical earth models. A variety of applications and real data examples is presented.

**COURSE CONTENT**

- Introduction
- Hooke’s law, anisotropy and elastic wave velocities
- Sedimentary rocks as heterogeneous media
- The concept of the Representative Elementary Volume (REV) and effective elastic properties
- Voigt/Reuss and Hashin-Shtrikman bounds
- Modulus-porosity relations for clean sands
- Critical porosity and mechanical percolation
- Gassmann’s equations and fluid substitution
- Fluid properties and mixtures
- Diagenetic and sorting trends in velocity-porosity data
- Velocity-porosity models for shaly sands
- Empirical relations between velocity and porosity, clay content, etc.
- Properties of sand-clay mixtures
- Velocity-porosity relations for shales
- Relations between VP and VS
- Rock compressibilities and relation of 4D seismic to well testing
- Reflection coefficients and AVO
- Elastic impedance
- Rock physics templates
- Effective medium and effective field theories
- Velocity-porosity relations for carbonates
- Biot theory
- Patchy saturation
- Squirt flow
- Sediment compaction and the state of stress in the Earth
- Pore pressure and the concept of effective stress
- Poroelasticity
- Application to pore pressure prediction
- Fracture gradient and 3D stress modeling
- Effect of stress on seismic body waves
- Third-order elasticity
- Granular media and discrete element methods
- Displacement discontinuity methods
- Stress sensitivity of sandstones
- Stress sensitivity of shales
- Stress perturbations around a borehole
- Determination of velocity variations around a borehole from advanced sonic logging

**AUDIENCE**

Geoscientists, petrophysicists, and engineers wishing to understand rock physics and learn how to work together in integrated teams to build geomechanical models.

**PREREQUISITE**

A basic knowledge of Geology, Geophysics, and Petrophysics.

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**Petrel Reservoir Geomechanics**

**Skill – 2 Days**

This course introduces reservoir engineers and consultants to some basic concepts in geomechanics and the Petrel platform. Attendees will learn how to incorporate data about geomechanical effects into reservoir models of well production behavior.

In addition to introducing geomechanics concepts, this course presents the types of data used for geomechanical modeling in the petroleum industry, and some of the geomechanical effects observed in oil and gas reservoirs and the subsurface during hydrocarbon production. The course also includes how to build reservoir models that show geomechanical effects such as pressure, stress, and strain, as well as data on reservoir flow, illustrating the effects over time, and how to build reservoir geomechanical models using the Petrel software platform.

**COURSE CONTENT**

- Introduction to Petroleum Geomechanics
- Review of Geomechanics
- Fundamentals of Reservoir Geomechanics
- The full Petrel Geomechanics Workflow

**AUDIENCE**

Reservoir Engineers and geotechnical consultants with good prior reservoir engineering and Petrel knowledge

**PREREQUISITE**

Petrel Reservoir Engineering and ECLIPSE
Mangrove Hydraulic Fracture Design Software

**Advanced – 5 Days**

Mangrove™ engineered stimulation design is built on the industry leading Petrel® E&P platform which links reservoir characterization, stimulation, and production simulation and helps optimize completion designs in conventional and unconventional reservoirs. In addition to the conventional planar fracture simulation models, two new unconventional fracture simulation models i.e UFM (Unconventional Fracture Model) and the wiremesh model are incorporated in the software that can simulate complex hydraulic fracture networks.

Mangrove, therefore, enables optimized completion design which helps in maximizing production performance and improved ROI in tight sand, shale, and conventional reservoirs.

**Course Content**

- Petrel Introduction for Mangrove users. Various introductory information on the use of Petrel and what is needed to run Mangrove.
- Well Setup
- Defining Zones
- Fluids and Proppants definitions
- Defining Completions
- Defining Treatment paths and pumping schedules
- 2D Fracture Networks definition in reservoir
- Defining Stimulation cases and the creating of Production Grids
- Production simulation case definitions
- NPV Analysis and the use of the Scenario manager for sensitivities
- Creating Mangrove Engineering Reports

**Audience**

This course is designed to introduce Reservoir Engineers, Geoscientist, Stimulation Engineers and Asset teams to the Mangrove Software.

**Prerequisite**

Petroleum Engineering, Geomechanics and Geology

Techlog for Unconventional Shales Evaluation

**Advanced – 3 Days**

In this course, you go through the complete petrophysical evaluation of a shale oil and a shale gas reservoir. The course covers the calculation of the organic matter content in the reservoir, the reservoir quantitative evaluation, and the computation of hydrocarbon volumes in place.

The specificities of the shale reservoir will be discussed (petrophysical properties, fluids behavior), and you will use some advanced measurements such as spectroscopy and NMR, and learn how to integrate these into your workflow.

**Course Content**

- Calculation of TOC, comparison of TOC from different sources
- Build a petrophysical interpretation model fit to shale reservoirs using Quanti. Elan
- Calculate hydrocarbon volume in place

**Audience**

- Development and Exploration Geologists
- Petro physicists

**Prerequisite**

Techlog Fundamentals
Techlog Quanti. Elan
Carbonates and Fractured Reservoirs

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked , while technical courses that use software have been marked , and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

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The courses are organized by competency level: Foundation, Skill, Advanced.
Fractured Reservoir Characterisation with Emphasis on Carbonates

Foundation – 3 Days

This 3-Day classroom course covers the essential topics in geology and geomechanics required by those dealing with fractured reservoirs, from appraisal through development to secondary recovery. It also introduces the basics of the reservoir engineering issues. Although much of the material is general to all types of fractured reservoirs, there is an emphasis on carbonates. Sessions include exercises and are intended to provide space for open discussion of the specific issues or datasets brought by participants. A comprehensive reference list of technical sources is provided to attendees, along with the slideset used during the course.

**Course Content**
- Course introduction and objectives
- Basics of structural geology for FRC
- Introduction to key data sources for FRC
- Fracture modeling
- Case histories
- Geomechanics and drilling in fractured reservoirs

**Audience**
Geologists, geophysicists, petrophysicists, and reservoir engineers looking to develop their skills in the fractured reservoir characterization workflow

**Prerequisite**
Basic background in geology and/or associated reservoir characterization subjects

Applied Carbonate Sequence Stratigraphy

Foundation – 5 Days

This 5-Day course focuses on carbonate sequence stratigraphy, with particular emphasis on practical application in oil and gas exploration and development.

**Course Content**
- Why carbonates are important to the oil industry
- Why carbonates differ from siliciclastics
- Basic controls on carbonate sedimentation
- Carbonate systems and platform types
- Introduction to sequence stratigraphy of carbonate systems
- Case studies: examples of different types of carbonate reservoirs
- Sequence stratigraphy versus lithostratigraphy
- Carbonate response to relative sea-level change
- Tectonic influences
- Climatic influences: icehouse/greenhouse climates
- Seismic recognition of carbonate systems
- Seismic sequence stratigraphy of carbonates
- Seismic geometry and geomorphology of carbonate systems
- Interpretation of carbonate sequences from wireline logs
- Diagenetic processes and models
- Carbonate pore systems
- Principles of geomodeling of carbonate reservoirs
- Objectives and workflows for describing carbonate reservoirs
- Flow units in carbonate reservoirs

**Audience**
Geologists, geophysicists, and petroleum engineers involved in exploration and development for carbonate reservoirs

**Prerequisite**
Basic knowledge of geology

Carbonate Sequence Stratigraphy and Application to Petroleum Reservoirs

Skill – 5 Days

This 5-Day course focuses on modern concepts of carbonate sedimentology, sequence stratigraphy, and diagenesis and how these impact on the exploration for, and production from, carbonate reservoirs. It is designed for exploration and development geologists, geophysicists, and reservoir engineers who need an understanding of occurrence and nature of carbonate reservoirs—their geometry, facies, and diagenetic alteration. Participants will learn and develop their skills over the 5 days through a mixture of fieldwork, individual and group exercises, and lectures.

**Course Content**
- Major controls on the occurrence and nature of carbonate platforms
- Depositional environments, facies, and facies models for rimmed carbonate platforms and ramps
- Exercises on modern carbonate lithologies
- Field-based study on carbonate grain types and early lithification in subtropical lagoon, beach, and reef environments
- Lectures on principles of carbonate sequence stratigraphy
- Field study of a Miocene fault-block carbonate platform
- Stratigraphic geometries, facies associations, depositional sequences, logging exercise, and recognition of potential reservoir facies
- Application of carbonate sequence stratigraphy and seismic stratigraphy to rimmed shelves and to ramps
- Tectonic/basinal controls on carbonate platform types
- Introduction to Bosence’s new genetic classification
- Near-surface diagenetic environments, processes, and products in carbonate rocks and relation to sequence stratigraphy
- Burial diagenesis
- Porosity and permeability evolution in carbonate reservoir rocks

**Audience**
Geologists, geophysicists, and petroleum engineers who wish to learn more about interpretation of carbonate reservoirs

**Prerequisite**
Basic understanding of geology

Field Trip: Arid Coastline Carbonates and Evaporites of Abu Dhabi, UAE

Skill – 5 Days

Dr. Anthony Kirkham leads participants on a study of the Recent, Holocene, Pleistocene, and Miocene carbonate and sabkha evaporite environments of central and western Abu Dhabi, one of the world’s best locations for studying such sediments. This trip’s destination is an outdoor laboratory in which attendees can
study geologically modern sequence stratigraphy in a proximal ramp situation with complete exposure of the sediments and rocks. This course will illustrate how a range of depositional, diagenetic, and erosional processes can combine to create a complex stratigraphic architecture that could be difficult to interpret subsurface. Learning how these processes interact in real life will provide valuable insight for the geologist who is faced with limited exploration or development data and needs to construct 3D models.

**COURSE CONTENT**

- Snorkeling across Recent carbonate sediments around Abu Dhabi Island
- Dolith deltas, interdelta coral reef patches, coral thickets, red algae, sea grass
- Ras Gharab and Futais Island: Pleistocene aeolianite and other enigmatic limestones
- Mussafah Channel: subtidal, intertidal, and supratidal sediments with evaporites and microbial mats
- Transgressive and regressive carbonates
- Salina deposits
- The origins of sabkhas
- Aeolian carbonate dunes and deflation
- Al Aryam: tidal channels, levees
- Understanding anhydrite distributions
- Ru'aiq approach road: lateral zonation within microbial mats, hardgrounds, and tepee structures
- Bu Labyad area: Miocene and Pleistocene zeugen and Miocene salina
- Thumayiyat: microbial mats and evaporites
- Jebel Dhanna: spit-lagoon complexes
- Beach rocks and conialolites
- Sabkha Matti: a continental sabkha
- Sia: beach ooliths
- Shuweihat Island: snorkeling on a modern fringing reef
- Evening lecture comparing Abu Dhabi with other Recent and ancient marine carbonate systems
- Liwa: modern giant barchan dunes with interdune sabkhas
- Return to Abu Dhabi

**AUDIENCE**

Geologists and petrogeologists wanting to understand carbonate and evaporite environments and how field outcrops relate to recorded data

**PREREQUISITE**

Geologists and petrogeologists wanting to understand carbonate and evaporite environments and how field outcrops relate to recorded data.

**Field Trip: Oligo-Miocene carbonate sedimentary models of Malta: analogues for Cenozoic reservoirs worldwide**

**Skill – 5 Days**

The 5-Day course is designed as an introduction to carbonate sedimentology and sequence stratigraphy through lectures and the excellent Oligocene and Miocene limestone outcrops of Malta and its sister island, Gozo. Malta benefits from excellent exposures of systems tracts across depositional models of both carbonate rimmed platform and a carbonate ramp and illustrates the principles of sequence stratigraphy. Additional interest arises from the overprints of synsedimentary tectonics associated with rifting, plus spectacular karstic collapse structures. These exposures provide a general training ground for carbonate rocks as well as very good analogs for Cenozoic reservoirs (e.g., SE Asia and Gulf of Suez).

**Course Offerings**

**COURSE OFFERINGS**

- Field Trip: Syn-Rift Carbonate Platforms; Miocene-Recent Gulf of Suez
  
  **Skill – 6 Days**
  
  This 6-Day field- and classroom-based course investigates the complex facies relationships found in rift basin carbonate platforms and provides insights into synsedimentary structural influences and changing depositional environments with rift basin evolution. Based on the shores of the southern Gulf of Suez, this course starts with a review and update on the processes of carbonate sedimentation using the natural laboratory of the nearby modern, shallow marine environments. Tectonostratigraphic models for carbonates are then investigated with a focus on rift basin environments. Concepts are reinforced and demonstrated in the field on world-class exposures of an exhumed Miocene carbonate platform. This enables potential reservoir facies to be studied in different structural settings and the change from marine to nonmarine carbonate factories to be correlated with rift basin evolution. Final review lectures examine evaporitic to marine to lacustrine rift basin carbonates from Mesozoic and Cenozoic basins.

**PREREQUISITE**

None

**Field Trip: Syn-Rift Carbonate Platforms; Miocene-Recent Gulf of Suez**

**Skill – 6 Days**

This 6-Day field- and classroom-based course investigates the complex facies relationships found in rift basin carbonate platforms and provides insights into synsedimentary structural influences and changing depositional environments with rift basin evolution. Based on the shores of the southern Gulf of Suez, this course starts with a review and update on the processes of carbonate sedimentation using the natural laboratory of the nearby modern, shallow marine environments. Tectonostratigraphic models for carbonates are then investigated with a focus on rift basin environments. Concepts are reinforced and demonstrated in the field on world-class exposures of an exhumed Miocene carbonate platform. This enables potential reservoir facies to be studied in different structural settings and the change from marine to nonmarine carbonate factories to be correlated with rift basin evolution. Final review lectures examine evaporitic to marine to lacustrine rift basin carbonates from Mesozoic and Cenozoic basins.

**COURSE CONTENT**

- Introduction to processes of carbonate accumulation, carbonate factories, and depositional environments
- Modern carbonate grains and textural classification of carbonates
- Carbonate facies and facies models
- Field study, Sharm El Naga: carbonate grain types and early lithification in subtropical lagoon, beach, fringing reef, and wadi environments
- Evening classroom: Gulf of Suez - Red Sea rift basin geological evolution
- Lectures and classroom exercises
- Principles of carbonate sequence stratigraphy
• Outcrop and seismic sequence stratigraphy of carbonates
• Tectonic classification of carbonate platforms
• Field study of a Miocene fault-block carbonate platform on the Gulf of Suez rift margin
• Evening exercise: interwell correlations in fault-block platform setting
• Field study of stratigraphic architecture and carbonate facies associations in a transfer zone setting
• Changing carbonate factories with rift basin isolation
• Exercise on stratigraphic logging and facies correlation
• Lectures and classroom exercises on rift basin carbonates
• Exercises on interpretation of marine and lacustrine carbonate reservoir rocks

AUDIENCE
Petroleum geologists, general geologists, sedimentologists, reservoir modelers, reservoir engineers, petrophysicists

PREREQUISITE
Basic knowledge of geology

Advanced Carbonate Petrophysics From Pores to Logs

Skill – 5 Days

This hands-on course focuses on why pore geometry must be the focal point for carbonate petrophysical analysis. Participants will work with petrographic information, mineralogy data, routine core analysis, capillary pressure, electrical rock properties, nuclear magnetic resonance, and open hole logs. The importance of core-log integration and cross-calibration is shown, as well as reducing the uncertainty of computed reservoir properties. Petrophysical property analysis is often the key to building a static reservoir description. But in carbonates, a model that is not cross-calibrated from core to logs to seismic may result in a large statistical uncertainty.

COURSE CONTENT
• General introduction to the course
• Course objectives and deliverables
• Quick review of carbonate systems
• Why petrophysics is important
• Steps needed in calibrating core-to-log lithology
• Lithology workshop
• Total porosity and how it is determined
• Effective porosity and how it is determined
• Calibrating core and log porosities
• Porosity workshop
• Open hole porosity
• Quicklook log analysis
• What parameters are needed to estimate a water saturation?
• Log workshop
• Introduction to petrophysical rock types and pore geometry
• Petrophysical rock type workshop
• Applied capillary pressure
• Calibration of predicted pore throat radius and lab-determined pore throat radius
• Capillary pressure workshop
• Permeability and cross-calibration between core and logs

• Applied flow units
• Flow unit workshop
• Well evaluation workshop
• Final participant presentation of results

AUDIENCE
A subsurface professional working on early field development, static model building, or advanced recovery methods in carbonates

PREREQUISITE
Basic understanding of carbonate depositional systems, lithology, and pore geometry

Advanced Formation Evaluation in Carbonates

Advanced – 5 Days

This 5-Day course focuses on advanced interpretation in carbonates. There is a strong emphasis on evaluating the parameters that affect carbonates, such as m, n, and microporosity. This course includes 1 to 2 hours daily of workshop examples and will be extremely useful to petrophysicists, reservoir engineers, and geologists who work in carbonates reservoir environment.

COURSE CONTENT
• Carbonate geology and deposition
• Dolomitization
• Nuclear magnetic resonance and the NMR scanner
• Acoustic measurements and the acoustic scanner
• Borehole imaging using microresistivity and ultrasonic imaging
• Physics of neutron logging using pulsed neutron to give a sigma log
• The physics of dielectric logging and the dielectric scanner
• Variable m and the formation factor applications
• Wettability and the variable n
• Effect of vugs and fractures on resistivity measurements
• Dual porosity: macroporosity and microporosity
• Permeability estimations in carbonates
• Connectivity theory: a new approach for interpretations in carbonates
• Flow units and the Lorenz plots
• Capillary pressure from core analysis
• Capillary pressure from the NMT T2 conversion
• The J-function
• Rock types: Winland and the ADNOC function

AUDIENCE
Petrophysicists, reservoir engineers, and geologists who work in carbonates reservoir environment

PREREQUISITE
None
Evaluation and Management of Fractured Reservoirs

**Advanced – 5 Days**

This 5-Day course covers the elements needed in the evaluation of fractured petroleum reservoirs from both an exploration and a development point of view. A general sequence of study will be presented, as well as the data types needed to complete the study. Techniques presented will emphasize outcrop and subsurface rock data, petrophysical data, rock mechanic principles, and reservoir performance data. A multidisciplinary approach to the study of these reservoirs will be stressed. Participants should leave the course with knowledge of what controls short-term and long-term performance in fractured reservoirs and the types of data necessary to evaluate and manage them.

**COURSE CONTENT**

- Introduction to fractured reservoirs and their development consequences
- General geomechanics and focus on fracture formation
- Demonstration experiment of fracture formation
- Exercise
- Fractured reservoir type classification and associated field development strategies
- Case history: prediction of open fracture location and orientation
- Virtual field trip along natural fracture systems
- Fracture detection: borehole image tools
- Fracture detection: seismic methods
- Case histories
- Basement fractures and prediction of their location, orientation, and depth
- Sealing fractures: prediction of location and orientation
- Case history
- In situ stress determination, relevance for field development planning
- Integrated final exercise

**AUDIENCE**

Geoscientists and reservoir engineers who need to know how fractured reservoirs differ from conventional reservoirs; those working with fractured basement reservoirs for groundwater and/or geothermal resources

**PREREQUISITE**

Applied knowledge of reservoir geology and/or reservoir engineering

Characterization, Evaluation and Enhanced Oil Recovery in Naturally Fractured Reservoirs

**Advanced – 5 Days**

Natural fractures are increasingly recognized as dominant permeability paths in many reservoirs. Unfortunately, there are few guidelines available for geologists and engineers characterizing and engineering naturally fractured reservoirs. This course is intended as an up-to-date summary of an integrated reservoir study, including characterization, experimentation, and integration of information in determining the most suitable process option in naturally fractured reservoirs. Most of the information originates from the ongoing CO2 pilot in the naturally fractured Spraberry Trend Area in West Texas. Two other important case studies are also presented: The Midale CO2 flood conducted by Shell Canada and a 15-year-old gravity stable CO2 pilot in West Texas.

**COURSE CONTENT**

- Characterization of naturally fractured reservoirs
- Geological and petrophysical analysis of reservoir cores
- Screening reservoir data for waterflood and gas injection candidates
- Core-log integration, reservoir characterization
- Development of specific algorithms for log evaluation
- Fracture identification (natural or coring induced) and characterization
- Well test analysis and analysis of inflow performance of horizontal wells
- Imbibition, capillary pressure, interfacial tension, and wettability determination
- Scaling laboratory results to predict waterflood response
- Numerical simulation of waterflooding naturally fractured reservoirs
- Phase behavior and minimum miscibility pressure determination
- Gas injection experiments in fractured systems
- Evaluation, scaling, and design of gas injection results
- Case history review of Midale CO2 pilot and Wellman Unit CO2 flood

**AUDIENCE**

Reservoir engineers, geoscientists, operating personnel, other actual or potential asset team members

**PREREQUISITE**

Experience in oil and gas field operations; some knowledge of naturally fractured reservoirs
Deepwater Exploration and Production

NExT’s curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked 🔴 while technical courses that use software have been marked 🐠 and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 🐮. There are some courses that use simulators and are highlighted with 🔴.

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<tr>
<th>COMPETENCY LEVEL</th>
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<tr>
<td>ADVANCED</td>
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<td>Deepwater Seismic Interpretation</td>
<td>HPHT Drilling Design and Operations</td>
<td>Deepwater Geohazards</td>
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<td>SKILL</td>
<td>Depositional Environments from Slope Aprons to Tropical Reefs - Tabernas &amp; Sorbas Basins, Spain</td>
<td>Deepwater Drilling Design and Operations</td>
<td>Deepwater Well Project and Risk Management</td>
<td>Economies of Deepwater Projects</td>
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<td>FOUNDATION</td>
<td>Permian basin floor fan systems of Karoo South Africa</td>
<td>Sedimentology and Depositional Environments of Deepwater Deposits</td>
<td>Deepwater Petroleum Systems - Fundamentals and Applications</td>
<td>Subsea Production Systems (SPS) and Technologies</td>
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Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Deepwater Exploration and Production

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<td>Wellflo Underbalanced Hydraulics Modeling</td>
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Software: 🌐
Technical courses that use software: ⚡
Includes practical sessions: ⌚️
Field trips: 🏈
Uses simulation: 🎨
Immersive Learning Programs

Deepwater Reservoirs

Foundation – 5 Days

This in-depth course provides the process sedimentology background required to understand deepwater systems and to recognize sediment gravity flows on subsurface datasets. Course participants will be able to:

- Differentiate between mass transport complexes, sediment gravity flows, and contours and predict net/gross values for each in seismic data
- Differentiate between channels, lobes, mass transport complexes, and contoured deposits on well logs
- Identify processes responsible for sedimentary structures, bedforms, and lithology and use these to determine deposition environments and lateral continuity of reservoirs from core samples
- Correlate reservoir sandstones using concepts developed by Mike Gardner in the Brushy Canyon formation of the southwestern U.S. The course also builds on several outcrop analogs, including the Ross formation of Ireland

Course Content

- Introduction to deepwater oil and gas exploration
- Sequence stratigraphic controls on deepwater sedimentation
- Exercises on sequence analysis on seismic and well logs.
- Fluid gravity vs sediment gravity flows
- Hyperpycnites, debrites, contortions (bottom-current deposits), turbidites, hybrid beds, traction vs suspension bedforms, liquefaction and fluidization
- Mass transport complexes and the effects of processes on reservoir quality.
- Hierarchy, fill, architecture, evolution
- Recognition in outcrop, core, well-logs and seismic.
- Hierarchy, fill, architecture, evolution
- Recognition in outcrop, core, well-logs and seismic.
- Mike Gardner’s BCFS, AIGR and SSEM models, LOBE and SLOPE consortia at the University of Liverpool
- PAB consortium out of IFP, France.

Audience

Geoscientists who wish to understand deepwater reservoirs.

Prerequisite

Basic knowledge and understanding of geology.

Introduction to Deepwater Rig Operations

Foundation – 5 Days

This course will describe the different types of deepwater drilling units, including the specific equipment requirements and techniques to spud a well. The goal of this course is to expose the attendees to brief but precise information on floating drilling rigs, SS and DPDS, and their specific equipment for drilling wells in deepwater zones. Techniques and methods employed extending from the arrival of floating drilling units on a location until the cementing of the casing will be presented. Major issues and solutions faced in deepwater drilling operations is also included as well as the environmental forces and their impacts on deepwater operations. Key learning objectives of this course include what is an SS and a DPDS with their advantages and disadvantages; description and function of all specific equipment deployed in deepwater operations, either on the floating rig or subsea (riser, BOP, wellheads, tensioners etc.); the different station keeping methods for maintaining a floating drilling vessel on location (mooring, dynamic positioning); and the environmental forces and their impact.

Course Content

- Floating drilling units
- Vessel stability
- Mooring systems
- Dynamic positioning operations
- Riser systems
- Subsea wellheads and casing operations
- BOP equipment
- Emergency disconnect
- Plug and abandonment

Audience

Operators, drilling supervisors, junior level staff, company representatives, new managers, drilling contractor personnel involved in drilling, marine, maintenance, supervision, management, and service company management, and team leaders.

Prerequisite

Basic drilling operations knowledge and an understanding of the marine environment for drilling operations. Offshore drilling experience is beneficial.

Deepwater Petroleum Systems - Fundamentals and Applications

Skill – 5 Days

This course covers the fundamentals of PSA with an emphasis on deepwater applications. PSA, a relatively new specialization in the field of petroleum geology, is an investigation in the generation of hydrocarbons in the subsurface and reconstructing the filling history of existing oil and gas accumulations, aiming to quantify the charge risk of undrilled prospects. Deepwater environments present the petroleum system analyst with a number of specific challenges because source rocks are typically beyond the reach of the drill bit and oil-to-source rock correlations are complicated by oil transformation processes such as remigration and biodegradation. Following a 3-day introduction to the PSA fundamentals, case histories from the Gulf of Mexico, offshore West Africa, and the Mediterranean are presented. Special attention is given to geochemical well evaluations, which form an essential part of PSA, not only in deepwater environments but also for the evaluation of unconventional hydrocarbons such as shale gas and basin center gas.

Course Content

- Source rocks
- Burial, temperature, maturity
- Petroleum geochemistry
- Deepwater well evaluations
- Applications

Audience

Geoscientists working in (deepwater) exploration and their direct supervisors in addition to reservoir engineers, petrophysicists, and prospect portfolio analysts.

Prerequisite

Basic geology and chemistry understanding, but not essential.

Subsea Production Systems (SPS) and Technologies

Skill – 5 Days

This 5-Day course provides participants with an introduction to subsea production facilities. It will take participants from the conceptual design to the operation of the subsea production facilities. Participants will have the chance to learn about typical system architecture, design drivers, and general requirements for a
subsea production system (SPS). Equipment design and operations, flow lines, flow
assurance, and material selection will all be covered.

COURSE CONTENT

• SPS concepts and definitions
• General design requirements
• Equipment and operations
• Procedures for operations
• Maintenance and repair
• Limitations, barriers, and challenges
• SPS technology
• Major subsea technology
• Global energy balance
• Flow assurance
• Subsea well intervention
• Data acquisition and data management
• Instrumentation, control, and monitoring systems
• Integrated systems

AUDIENCE

Engineers involved with subsea facilities design and operations or anyone who
wants to learn about the evolving subsea facility technologies

PREREQUISITE

Participants should have a general knowledge of oil and gas production systems
and offshore production systems

Sedimentology and Depositional Environments of
Deepwater Deposits

Skill – 5 Days

This 5-Day course covers the theory and application of sedimentology and
depositional environments of deepwater deposits. The course consists of an
extensive series of topic-related modules in addition to workshops on attendee
datasets.

COURSE CONTENT

• Lecture modules supported and complemented by a number of paper-based
  exercises mostly built around correlation problems
• Full set of lecture materials and exercises and the book "Petroleum Systems
  of Deepwater Settings" by P. Weimer and R.M. Slatt given to each attendee
  [subject to availability from the publishers and to timely advice by the client on
  the required number of copies]

AUDIENCE

Geologists

PREREQUISITE

Reasonable knowledge of petroleum geology.

Field Trip: Permian basin floor fan systems of Karoo,
South Africa

Skill – 6 Days

This course will help attendees understand the lithofacies and architectural
relationships of the Permian basin floor fan system in the Tanqua-Karoo area
(western Cape, South Africa) from outcrops, cores, and logs. This area contains
some of the world’s best basin floor exposures. This region has been the topic of

a European-sponsored research project in which a large amount of outcrop data has
been acquired and seven research boreholes were drilled, cored, and logged with
state-of-the-art logging suites. These data and the important results of the project
will be shared with the attendees. Hiking over the succession from the basinal
fans across the shelf edge to the prodelta deposits is a highlight of the course. The
course base is the Inverdoorn Game Lodge.

COURSE CONTENT

• Ordovician to Devonian succession
• Overview of Western basin margin and its development
• Channel geometries, levees, collapse structures, paleoflow relationships, and
  thin-bedded overbank deposits
• Study internal architecture, sedimentary structures, and Fan 3 sheet sands
• Lobe architecture, beds-elements-lobe associations, local channelization, and
  linked debrites
• Inverdoorn core workshop, logs and borehole images, and comparison with
  outcrops
• Using well data and outcrop analogues for reservoir modeling
• New information from cores/logs not observed in outcrops
• Hike entire sedimentary succession from basin floor fans to slope deposits, shelf
  edge transition, and prodelta deposits

AUDIENCE

Petroleum geologists, general geologists, sedimentologists, reservoir modelers,
reservoir engineers, and seismic interpreters.

PREREQUISITE

None

Deepwater Sedimentary Systems: Exploration and
Production

Skill – 3 Days

Addressing the complexities of deep marine systems, this course teaches attendees
how these facies evolved on the slope and in the open ocean, how they build into
distinctive architectural elements, and how to recognize them. The course covers
how to analyze and interpret seismic records, seafloor images, well logs (including
borehole image logs), core materials, and outcrop characteristics of deepwater
reservoir components with an emphasis on internal architecture as related to
reservoir performance. Attendees will perform hands-on case studies of deepwater
plays from around the world, illustrating characteristics unique to their exploration,
appraisal, development, and reservoir management.

COURSE CONTENT

• Deepwater overview and building blocks
• Downslope, along-slope, and open-ocean systems
• Architectural elements: Nature and recognition
• Channel style and geometry
• Lobes, mounds, and sheets
• Deepwater massive sands
• Thin-bedded turbidites
• Deepwater drilling, seismic sequence stratigraphy, and deepwater plays review
• Subsurface models

AUDIENCE

Geologists, geophysicists, and petroleum engineers involved in exploration and
development of deepwater plays and project managers of deepwater plays and
reservoir production.
**Deepwater Well Project and Risk Management**

**Skill – 5 Days**

The key objectives for this course will be to highlight the critical project and risk management issues required to run a deepwater well, to help participants become familiar with key issues and principles and to develop an understanding of the challenges, choices, and compromises necessary to drill deepwater wells.

**COURSE CONTENT**

- The Stage Gate Process
- Integrated management system and documentation
- Regulatory and Health Safety and Environment (HSE)
- Hazards, probability, and risk
- Time and cost estimation
- Management of change
- Supply chain, logistics, and operations base
- Management review and quality control
- Well PM software and Key Performance Indicators (KPIs)
- Task progress and phase close out
- Rig selection
- Riser and conductor design
- Contingency plans
- Emergency response
- Applying risk management tools
- Macondo review
- Analysis and key factors for focus
- Teamwork
- Training, competency assurance, and situational awareness
- Communications and decision-making
- Managing change

**AUDIENCE**

Drilling managers, operations superintendents, senior well engineers, well engineers, as well as wellsite leaders and supervisors involved in deepwater well projects. This course is also suitable for general managers, asset managers, project managers, and others involved in the planning and management of deepwater drilling activities.

**PREREQUISITE**

Basic petroleum geology, basic stratigraphy, and basic sedimentology.

**Deepwater Drilling Design and Operations**

**Skill – 5 Days**

This course is designed to help drilling engineering professionals understand the technologies, terminology, concepts, processes, and equipment used to drill deepwater oil and gas wells. The course follows a typical deepwater drilling program and drilling process from geology to rig selection and station keeping to conductor driving and surface casing setting followed by wellhead systems, BOP and marine riser systems to typical deepwater rig equipment. Once the drilling process and equipment is reviewed, we then look at some of the other aspects that are different for deepwater drilling technology such as well control, shallow hazards and then we move to some of the new emerging technologies such as dual gradient and managed pressure drilling. Finally we discuss some of the typical operational aspects and workaround issues associated with deepwater wells.

**COURSE CONTENT**

- Drilling units
- Drilling equipment specific to deepwater drilling
- Pore pressure and fracture pressure window
- Well control
- Riser selection
- Hydrates
- Drilling fluids
- Dual gradient and managed pressure drilling
- Completions

**AUDIENCE**

Drilling professionals with well design and operations experience desiring an understanding of the challenges faced in the deepwater drilling environment.

**Field Trips: Depositional Environments from Slope Aprons to Tropical Reefs - Tabernas & Sorbas Basins, Spain**

**Skill – 5 Days**

This 5-Day field course offers attendees an extensive series of outcrop examinations, field-based correlations, reservoir descriptions, instructions, and exercises. The course aims to familiarize the attendees with the stratigraphy, shape, and scale of depositional bodies in small active Neogene basins. The value of sequence stratigraphic approaches, paleobathymetric analyses, and structural setting of the basin on predicting the large-scale character of the late Miocene deposits will be addressed in an appraisal and development context. Outcrop studies will illustrate the types of geological heterogeneity that occur in such sequences and show the geological processes responsible for these different hierarchical scales of variability. Relaxed team exercises at the outcrops will enhance knowledge transfer.

**COURSE CONTENT**

- Introduction to the Paleocene to Pleistocene infill of the Tabernas basin
- Assessing mass flow processes and deposits in the basal succession
- Tabernas basin (late Miocene)
- Assess sedimentary processes in high net to gross turbidite system
- Map depositional architecture of scour lobes
- Sorbas basin (Paleocene-Pliocene)
- Sediment production during relative increase in sea level (late Tortonian to late Messinian)
- Messinian evaporite cycles
- Carboneras basin (Serravallian-Pliocene)
- Introduction at the volcanic basement with sediment onlap (Early Tortonian)

**AUDIENCE**

Exploration and production geologists, geophysicists, and petroleum engineers who need a sound understanding of deep-marine and shallow sediments and their architectural elements.

**PREREQUISITE**

Basic knowledge of geology.
PREREQUISITE
Understand basic geomechanics, drilling operations, well placement, well planning, and drilling fluids basics.

Economics of Deepwater Projects
Skill – 3 Days

This 3-Day course is for attendees who already have some experience running project economics in the oil and gas industry but would like to learn how to model and evaluate the economics of deepwater development projects. An overview of the exploration, development, and production processes involved in deepwater projects will be presented. An evaluation model and method for evaluating deepwater projects will then be presented and discussed using supporting case studies. Attendees will learn how to incorporate common technical and nontechnical risks and uncertainties to arrive at a complete evaluation of the economics of deepwater projects.

COURSE CONTENT
- Framework for deepwater economic evaluations
- Decision framework of deepwater projects
- Development schedule and cash flow
- Deepwater decision analysis
- Decision analysis structure
- Risk identification and incorporation
- Decision trees

AUDIENCE
Engineers, economists, managers, or other technical staff with experience in project economics who want to learn how to model and evaluate the economics of deepwater projects.

PREREQUISITE
Experience with petroleum economics or equivalent.

Deepwater Geohazards
Skill – 5 Days

Obtain a good understanding of the geological, geophysical and geomechanical aspects of geohazards, their prediction and mitigation.

Learn about the potential drilling risks and mitigation.

Please note that this is not a drilling deep water course but it complements such course.

The course is most suited for geoscientists, petroleum engineers and drilling engineers who want to know more about geological and geophysical aspects of geohazard.

COURSE CONTENT
- Key Geohazard Mechanisms
- Understanding and their predictions
- Fundamental of geomechanic and its applications in drilling,
- Basic of pore pressure and over pressure mechanisms
- Pore pressure prediction methods (pre-drill, while drilling and post drill)
- Identification of geohazard related to drilling A-Z (from platform installation to drilling, completion and production)
- Geo-hazards Identification, Understanding risk & Mitigation

AUDIENCE
Geophysicists, geologists and drilling engineers

PREREQUISITE
None
Deepwater Seismic Interpretation
Advanced – 5 Days

This course addresses the problem of accurate seismic interpretation in deep-water and the delicate construction of seismic maps in the deep-water realm. It is intended to all petroleum professionals involved in exploration and production, geophysicists, geologists, rock physicists, reservoir engineers and drilling engineers.

** COURSE CONTENT **
- **Seismic Interpretation Concepts.**
- **History of the Seismic Reflection Method.**
- **Reflection & Refraction, Wave Equations, Poisson’s Ratio. Waves, Convolution, Synthetic Seismograms.**
- **Amplitude and Phase Spectrum - Deconvolution.**
- **Seismic Acquisition and Processing Workflows.**
- **Deep-Water Petroleum Geology Provinces and World Distribution of Deep-Water Basins.**
- **Exploration and Production in Deep-Water.**
- **Deep-Water Seismic Reflection Section Parameters 2D and 3D.**
- **Un-migrated and Migrated Deep-water Seismic Sections and Dip and Strike Sections in the Deep-water Realm.**
- **Seismic Ties, Time Maps. Four-Way Dip Closures, Fault Closures- Exercises.**
- **Structural Interpretation in Deep-Water - Examples.**
- **Seismic Stratigraphic Mapping in Deep and Ultra deep-water. Onlaps/Toplaps/ Downlaps/Offlaps - Exercise.**
- **Sands and Carbonates Reservoir Stratigraphy. Deep-Water Reservoirs Stratigraphy - Turbidites.**
- **Well Location and DrillMap Exercise.**
- **Bright-spots - Dim-spots - Flat-spots. Seismic Attribute Analyses.**
- **AVO – Amplitude Variation with Offset Evaluations**
- **Map contouring exercises - anticline, rift basin, compressional basin.**
- **Interpretation of deep-water records offshore rifted margins.**
- **Data Comparisons: Gulf of Mexico, Offshore Brazil and West Africa, North Sea, Australia Northern Shelf/Slope, Southeast Asia Timor and Arafura Seas, Andaman Sea.**
- **Mapping Exercise #2: Syn-Rift Isopach Mapping. Seismic Velocities: Average, Interval, NMO, RMS, Dix Equation.**
- **Mapping Exercise #1: Top and Base Salt Mapping in deepwater. Pull-up correction base salt. Bathymetry correction. Mapping Techniques - Discussion. Time and Depth Map Contouring in deepwater.**
- **Depth Conversion Techniques: PSTM and PSDM.**
- **Gas seeps and gas hydrates recognition. Overpressure prediction**
- **Mapping reservoir porosity, net to gross and net pay thickness.**
- **Reservoir identification - bright spots, dim-spots, flat-spots.**
- **Attributes: amplitude, frequency and phase, windowed attributes.**
- **Comparative Interpretation of Post-Stack & Pre-Stack Time Migration.**
- **Pre-Stack Depth Migration - Interpretation.**
- **Mapping Exercise #3: Turbidite Play Offshore Brazil. Mapping Techniques Precision.**
- **Map Contouring - Block Faulting.**

** AUDIENCE **
Geologists, Geophysicists and Engineers who need to understand Seismic Interpretation in Deep Water Environments

** PREREQUISITE **
Some knowledge of Applied Petroleum Geology-especially DeepWater Geology

HPHT Drilling Design and Operations
Advanced – 5 Days

This course has been designed to help drilling engineering professionals understand the technologies, terminology, challenges, concepts, processes, and equipment used to drill High Pressure and High Temperature oil and gas wells.

** COURSE CONTENT **
- **Defining the HPHT Environment**
- **HPHT Challenges and associated Standards and Practices**
- **Geology in the HPHT Environment**
- **HPHT Reservoirs**
- **Casing Design and Tubular Selection**
- **Shoe Placement**
- **Annular Pressure build up and Thermal De-rating**
- **Casing Wear, H2S and CO2 Effects**
- **Cementing Challenges and Practices**
- **Drilling Fluid Aspects**
- **Gas Solubility**
- **Elastomers**
- **Well Control, Ballooning, Wellbore Breathing**
- **Gas Expansion**
- **Well Control Procedures**
- **Surface Equipment for HPHT**
- **Downhole Equipment Challenges**
- **Managed Pressure Drilling**
- **Finger Printing and Drilling Practices**
- **Contingency Planning**

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
**Wellflo Underbalanced Hydraulics Modeling**

**Foundation – 2 Days**

This 2-Day course teaches the fundamentals of using the Neotec Wellflo software. It shows the user how to enter the required well data and how to run underbalanced and managed pressure drilling simulations with the software. The course is a mix of PowerPoint slides and individual hands-on exercises to show the participants the use of the software. At the end of the course, participants should be able to enter the required well data and run simulations using the software.

**Course Content**

- Underbalanced drilling
- Air drilling
- Foam drilling
- Multiphase flow
- Flow patterns
- Heat transfer
- Operating windows
- Bottom hole pressures
- Equivalent liquid flow
- Hole cleaning
- Liquid hold up
- Reservoir contributions
- Correlations
- Managed pressure drilling
- Parameters and charts
- Exporting data
- Expert input data
- Operating windows
- Reservoir inflow performance

**Audience**

Drilling and fluid (mud) engineers planning underbalanced, air, or foam drilling operations; drilling managers and drilling supervisors requiring a better understanding of air, foam, or underbalanced drilling fluid hydraulics

**Prerequisite**

Comprehension and understanding of well design and hydraulics; an understanding of the basics of underbalanced, air, and foam drilling

**OLGA Flow Assurance (5 days)**

**Foundation – 5 Days**

During this 5-Day course, you will learn how OLGA dynamic multiphase flow simulator is used to understand and solve typical flow assurance challenges. This interactive and practical course includes step-by-step instructions to build and run simple transient simulation models. Key operational procedures are covered, like shut-down, start-up, and pigging. Best practices and workflows are also presented for liquid and hydrate management, slugging recognition and mitigation, and fluid handling in OLGA.

**Course Content**

- Introduction to multiphase production hydraulics and thermal issues
- Introduction to OLGA GUI
- Fluid handling in OLGA
- Introduction to the Flow Assurance concept
- Simulation of terrain slugging mitigation, hydrodynamic slugging and usage of OLGA Slug tracking
- Construction of a well-pipeline-riser oil system to simulate typical operational scenarios like shut-in, cool down, start-up and depressurization
- Simulation of liquid accumulation and pigging in gas condensate pipeline
- Evaluation of hydrate formation risk and inhibition
- Modeling separators and controllers in OLGA
- Modeling a pipeline using the Pipeline editor
- Introduction to advanced thermal modeling options

**Audience**

Anyone interested in gaining a general understanding of OLGA dynamic multiphase flow simulation to address flow assurance challenges, or beginner to intermediate OLGA users who want to explore OLGA advanced workflows and tools.

**Prerequisite**

No previous experience with OLGA is necessary, but a general knowledge of pipe flow and thermodynamics is an advantage.
OLGA Flow Assurance (3 days)

**Foundation – 3 Days**

This 3-Day flow assurance with the OLGA multiphase flow simulator course is intended to turn the beginner into an OLGA simulator user, capable of running realistic flow assurance tasks. A mixture of lectures and hands-on exercises helps the attendees understand the flow assurance challenges, the fundamentals of multiphase pipeline thermo-hydraulics, and how to apply OLGA in realistic flow assurance issues. The exercises are conducted using the OLGA GUI. All major features of the GUI are covered, including model building, case runs, parametric studies, and effective postprocessing. Fluid property tables for the OLGA simulator are generated with PVTsim third-party compositional pressure-volume-temperature compositional analysis. Our experienced instructors focus on teaching attendees how to turn data into a high-quality and effective OLGA model and how to perform simulations.

**Course Content**
- Basic multiphase production hydraulics and thermal issues
- Introduction to OLGA topology and basic assumptions
- Introduction to PVTsim analysis
- Flow assurance issues for oil and gas-condensate production
- Terrain slugging mitigation, hydrodynamic slugging, and OLGA slug tracking
- Shut-in, cool-down, start-up and depressurization of a well-flowline-riser configuration
- Building a simulation model with minimum information
- Gas condensate pipeline-modeling: characteristic steady-state behavior, pigging, turndown, ramp-up, three-phase flow, separator with level control

**Audience**
Beginner to intermediate OLGA simulator user, prospective OLGA simulator licensee, and the design or operations professional interested in exploring the uses and capabilities of multiphase transient simulations.

**Prerequisite**
No previous experience with the OLGA simulator is necessary, but a general knowledge of pipe flow and thermodynamics would be advantageous.

Drillbench Dynamic Well Control Modeling

**Foundation – 2 Days**

This 2-day course teaches the fundamentals of using the Drillbench Presmod Kick software. The course shows the attendees how to enter the required well data and how to run the dynamic well control simulations using the software. The course contains a mix of Microsoft PowerPoint slides and individual hands-on exercises to teach the attendees how to use the software. At the end of the course, the attendees will be able to enter the required well data and run well control simulations using the software.

**Course Content**
- Well control modeling
- Data entry into the software

**Audience**
Drilling engineers and drilling supervisors requiring a better and a more detailed understanding of potential well control issues.

**Prerequisite**
Familiar with well control principles in addition to having an understanding of the basics of fluid and gas behavior and with circulating pressure losses and basic reservoir inflow.

Drillbench Blowout Control

**Skill – 3 Days**

This 3-Day course introduces the principles and concepts related to blowout control operations and the use of the Drillbench Blowout software. This course provides an overview of so called tertiary well control options and the engineering calculations required to ensure that a well kill can be achieved. This course also deals with the basics of relief well planning and it deals with dynamic well kill operations for blowout wells.

**Course Content**
- History of wild well control
- Blowout Types
- Current Blowout Control Methods
- Fluid Mechanics Of A Blowout
- Relief well planning
- Shallow Gas
- Building the Model and Using The Software
- Blowout paths
- Reservoir flow
- Capping and Capping stacks
- Bullheading
- Momentum Kill
- Relief well Planning
- Intersect
- Relief well kill operations
- Pump and kill schedules

**Audience**
This course is suitable for drilling engineers, wellsite supervisors and service providers who design, plan and manage drilling operations.

**Prerequisite**
The skill level for this course requires a good understanding of the conventional drilling and well construction process. Participants should have a minimum of 5 year drilling related experience and must have an understanding of conventional well control and fluid hydraulics principles. Numerous computer simulations will be done during the course.
**PIPSIM Artificial Lift Design and Optimization**  
**Skill – 2 Days**

Using PIPSIM 2012 software, you evaluate various artificial lift options for the conceptual design of a deepwater field development. You learn how to optimize gas lift allocation for a field on the basis of current operating conditions and constraints.

**COURSE CONTENT**
- Study conceptual design for deepwater development  
- Learn subsea tieback design  
- Evaluate inflow performance  
- Analyze gas lift design  
- Create ESP design  
- Discover multiphase booster performance  
- Review field performance forecast  
- Employ optimization of gas lift allocation

**AUDIENCE**
Anyone who needs to learn how to evaluate various artificial lift options, optimize gas lift allocation, and perform ESP design using PIPSIM software

**PREREQUISITE**
PIPSIM Fundamentals or a working knowledge of PIPSIM software

**INTERSECT Reservoir Simulation**  
**Skill – 3 Days**

The INTERSECT Reservoir Simulation course introduces reservoir engineers to methods of constructing simulation models using INTERSECT. The training discusses the main features of INTERSECT relative to working with Petrel or the ECLIPSE reservoir simulator. Along the way, users will also become acquainted with the basic features of the INTERSECT simulator. The course incorporates information about using Petrel pre- and post-processors as the primary front-end for the INTERSECT simulator.

**COURSE CONTENT**
- Overview of Reservoir Simulation with INTERSECT  
- The Petrel RE Workflow  
- The Migrator Workflow  
- The INTERSECT File Structure  
- The INTERSECT Input Format (IXF)  
- Field Management Concepts  
- Field Management Applications  
- Field Management with the Petrel User Interface  
- Reports  
- Differences Between INTERSECT and ECLIPSE  
- Simulator Performance Improvements

**AUDIENCE**
Reservoir engineers working on simulation studies

**PREREQUISITE**
Pipesim Fundamentals or a working knowledge of PIPSIM software. INTERSECT or ECLIPSE.

**Petrel Exploration Geology: Integrated Evaluation of Petroleum Systems, Plays and Prospects**  
**Skill – 3 Days**

In this 3-Day course the participant will learn to use the Petrel Exploration Geology software suite of integrated petroleum system-based play to prospect exploration tools and workflows (Petroleum Systems Quick Look and Play to Prospect Risk). Participants will undertake play evaluation exercises that integrate all the elements of the petroleum system into geologically-based, objective, consistent and documented results that can be used to understand and rank opportunities. You will learn how to use the software tools and develop a better understanding of the fundamentals of play and prospect evaluation and the reasons why an integrated approach results in better evaluations, and therefore, better exploration success.

**COURSE CONTENT**
- Petroleum system and play definitions and concepts  
- Introduction to the Petrel Exploration Geology tools  
- Integrating petroleum system and play analysis  
- Initial Screening of Concession Area  
- Play Analysis and Lead Identification  
- Lead Evaluation  
- Prospect Evaluation and Ranking

**AUDIENCE**
Geoscientists familiar with prospect exploration fundamentals and workflows who want to learn to perform them using Petrel Exploration software.

**PREREQUISITE**
Ideally, participants will have attended the Petrel Fundamentals class.

**OLGA Well Dynamics**  
**Skill – 5 Days**

This 5-Day course is intended to train the engineers who work with production and well performance to use OLGA 7.3 to simulate the flow transients in the wells and production systems.

**COURSE CONTENT**
- General introduction to OLGA’s capability for well modeling  
- Fundamentals of multiphase flow in production systems  
- Dynamic heat transfer modeling for wells/pipelines  
- The OLGA model and its execution  
- PVT and fluid modelling aspects in OLGA simulations  
- Well model building in OLGA  
- Inflow performance relationship modeling and injectivity modeling in OLGA  
- Annulus modeling and communication between annulus and production strings  
- Artificial lift (ESP/Gas-lift) modeling with OLGA  
- Mud and well engineering fluid modeling and applications  
- Well operation scenarios

**AUDIENCE**
Production and Well Performance engineers, especially suitable for Offshore Well operation scenarios

**PREREQUISITE**
No previous OLGA experience is necessary, but knowledge of well performance and multiphase flow modeling is an advantage.
PIPESIM Gas Field Production Operation

Skill – 2 Days

This course illustrates the usage of the PIPESIM 2012 steady-state multiphase simulator for designing and modeling the operations of gas production systems. Practical and comprehensive problems will be discussed and analyzed throughout the course.

COURSE CONTENT

• Understand how to navigate the PIPESIM user interface
• Size flowlines and surface equipment
• Understand how to troubleshoot and debottleneck network models
• Model water separation and injection into a salt water disposal well
• Model sources representing wellhead or manifold production
• Construct a compositional fluid model
• Predict gas hydrate formation
• Predict erosion and corrosion
• Predict liquid loading in gas wells
• Model centrifugal and reciprocating gas compressors
• Compare the relative benefits of push vs. pull compression
• Estimate the required slug catcher size
• Model a transmission network

AUDIENCE

Production Engineers, Facilities Engineers, Field Production Operations Engineers

PREREQUISITE

General knowledge on petroleum engineering as well as elemental software skills are recommended.
## Health, Safety and Environment

Next's curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

### DOMAIN

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Newcomer Employee Workplace HSE

**Awareness – 4 Days**

The course covers the awareness level of safety & health in the Oil & Gas Exploration & Production industry sector.

**COURSE CONTENT**

- Characterization of naturally fractured reservoirs
- Safety Briefing & Class rules
- Introduction to the O&G E&P Industry Sector
- General HSE Induction
- The Fundamental Concepts of Quality, Safety, Health, Environmental Protection and Person Security
- Personal Security
- Environment
- Health-Drug-Fatigue-Malaria-First Aid
- Vehicle Passenger Safety and Responsibility
- Hazard Identification in the Workplace
- Hazard Analysis and Control methods and tools
- Investigation: Responsibility at the accident scene
- Personal Protective Equipment (PPE)
- Fire Prevention
- Electrical Safety
- Emergency Response Plan (ERP)
- Hazardous Material Handling and Safety
- Explosive Safety
- Radiation Safety
- Pressure Safety
- Well Integrity Safety and Emergencies
- Permit to Work (PTW)
- Lock-Out/ Tag-Out (LD/TO)
- Mechanical Lifting Safety
- Value of Teamwork to Injury Prevention
- Workplace physiology and human-body mechanics
- Pre-work Warm Up Exercises
- Stepping, Handling & Lifting (SHL) Body Protection Techniques
- Classroom practice and application of SHL Techniques
- Application of Observation / Intervention and Motivation in the workplace
- Hand & Boot Safety Emphasis
- Classroom practice in Observation / Intervention on SHL Techniques
- Optional Worksite practice in SHL Techniques and Observation / Intervention Techniques

**AUDIENCE**

All newcomer field/operations employees should have an initial orientation of this sort before the first field exposure.

**PREREQUISITE**

None

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Oil Spill Response & Control

**Foundation – 5 Days**

This 5-Day course covers Oil Spill Response and Control Programs in the Oil & Gas Sector. It is an intense classroom-only course that teaches a system of pre-spill readiness, spill response drills, Incident Command System (ICS), and post-spill reaction planning, strategy, and tactics. The content taught is based on the global standard-setting U.S. FEMA Incident Command System (ICS).

**COURSE CONTENT**

- Introductions
- ICS 100/200 and Development of an ICS 201 (ICS Means Incident Command System, ICS 100/200 are Certification levels, ICS 201 is a form used to manage a spill)
- Decontamination Station (DECON)
- Spill Tracking and Modeling – Hands-on Spill Volume Calculations
- Developing Areas of Operation – ICS 100/200
- Common Operational Picture/Situational Mapping
- Resource Tracking (Staging Areas) and Ordering (Reactive and Proactive)
- Field Air Monitoring
- ICS Training – Tactical Response Planning
- Working Lunch and Use of JSEA (JSEA means Job Safety Environmental Analysis)
- Classroom Training on Boat Handling/GPS
- Classroom Training Spill Prevention and Planning/Boat Handling
- Classroom Training on Boom Deployment
- The Five Major Aspects of Spill Response
- Regulatory Control based on U.S. Applicable Laws & Regulations
- Consideration of Habitat and Sensitive Areas
- Weather, Tides, Currents
- Air Monitoring
- Spill Tracking and Observation
- SCAT Team Participation and Sampling (Shoreline Cleanup and Assessment Technique)
- Applicable Use of Skimmers
- When to Start; When to Stop (How Clean is Clean?)
- Transport and Disposal
- Case Studies & Lessons Learned on Recent Spills

**AUDIENCE**

The course is designed for Managers who need to assess the readiness of their organization for an Oil Spill Response; Members of the Oil Spill Emergency Response Teams (either as oil-contact field staff or office-based support staff).

**PREREQUISITE**

General experience in the Oil & Gas E&P, Pipeline/Transport, and Downstream Processing Sectors.
HSE for Front-Line Supervisors in Oil & Gas Exploration & Production

**Foundation – 4 Days**

This 4-Day course teaches the fundamentals of supervising the health, safety, security, and environmental aspects of fieldwork in the oil and gas E&P industry sector.

**COURSE CONTENT**

- Course introduction and workshop
- Concepts of management systems
- Roles and responsibilities for supervisors in HSE
- SMART objectives
- Concept of a safety and loss prevention committee (SLPC)
- Roles of an SLPC
- Leadership of an SLPC
- Meeting management skills and workshop
- Decision-making styles and workshop
- Working in a team
- Conflict management for frontline supervisors
- Coaching techniques for frontline supervisors
- Problem-solving techniques and workshop
- Hazard assessment and analysis
- Risk analysis matrix
- Team workshops on hazard assessment, analysis, and risk control
- Environmental risks in E&P and the supervisor’s role
- Occupational health risks in E&P and the supervisor’s role
- Behavior-based safety
- Motivation theory
- Role of the supervisor in observation and intervention
- Loss causation model
- Role of the supervisor in investigations
- Assessment and auditing
- Workshops on investigations
- Management of change
- Individual action plan presentations

**AUDIENCE**

Frontline supervisors, line managers

**PREREQUISITE**

None

HSE in Oil & Gas Exploration & Production

**Foundation – 5 Days**

The course will provide knowledge of the methodologies, processes, procedures, and tools of the HSE, necessary to ensure a safe working environment. The participants will understand how to identify and reduce risks to prevent the occurrence of events or incidents that impact personnel, facilities and the environment.

**COURSE CONTENT**

- Introduction to Health, Safety and Environment
- Risk Analysis
- Hazard Identification
- Accident Management
- Safety at Work
- H2S
- Fire Protection
- Permit to Work
- Emergency Preparedness
- Drilling Risk Management
- Well Control

**AUDIENCE**

All employed in the oil and gas industry

**PREREQUISITE**

Diploma or University education

QHSE for Line Managers

**Skill – 5 Days**

This 5-Day course is designed for two full-time qualified instructors. The maximum class size is 18 attendees. The course is organized to be team-based (three teams) and is workshop intensive. This course teaches the role of a line manager in the control of health, safety, security, and environmental risk. It is focused on field operations in the oil and gas E&P industry sector. It is designed to give a line manager an overview of the responsibilities and accountabilities of HSE/security risk management and control.

**COURSE CONTENT**

- The case for QHSE
- QHSE and corporate culture
- Teambuilding, motivation, and behavior change
- Video: “Major Malfunction”
- Management systems
- Policies and objectives
- Standards and guidelines
- Organizational structure
- Information management: QHSE meetings
- Information management: Internet resources
- The language of risk management
- Hazard recognition, analysis, and control
- Supply chain and contractor management
- Environmental risk management
- Emergency response
- Crisis management
- Personal security risk management
- Health risk management
- Team peer evaluations and individual action plan discussion
COURSE OFFERINGS

- Performance monitoring and improvement: records
- Investigation demo
- Performance monitoring and improvement: compliance monitoring
- Inspections, assessment, audits
- Corporate audits and reviews
- Review of action plans/team presentations

AUDIENCE
Managers with profit and loss statement authority

PREREQUISITE
Line management experience, or HSE for Frontline Supervisors (HE-TC1-NXT22200)

Risk Management for Projects
Skill – 2 Days

This 2-Day course focuses on risk management—one of the 10 knowledge areas of project management. Risk management focuses on dealing with the inevitable negative events that can occur on any project. Participants will learn determining methods to decrease the probability of those events or decrease the impact they will have on the project, or both. Participants will also learn about dealing with the potential opportunities. They will learn determining methods to either increase the probability of those events or increase the impact they will have on the project, or both.

COURSE CONTENT
- Foundation of risk management
- Project life cycle and risk management
- Identifying risks and the risk management process
- PMBOK® Guide and risk management
- Planning to manage risks and risk tolerance
- Analyzing the causes and effects of risks
- Qualitative and quantitative risk analysis
- Qualitative risk analysis and project stakeholders
- Probability and impact analysis matrix, including standard deviation curves
- Developing a decision tree
- Monte Carlo analysis and poor man’s Monte Carlo analysis
- Planning risk responses and monitoring risks during execution

AUDIENCE
Advanced project managers with at least one year of experience in managing projects

PREREQUISITE
A course in the fundamentals of project management

Drilling Project and Risk Management
Skill – 5 Days

This 5-Day course covers the application of sound project and risk management principles to the management of drilling operations. It uses a holistic, multidisciplinary, and integrated management approach that involves operations, personnel, administration, finance, and legal functions. The main goal of the course is to highlight the critical project and risk management issues that are required to run drilling projects in an efficient, safe, environmentally friendly, and cost-effective manner. At the end of the course, participants will be familiar with the key issues and principles, how to apply them in practice, and how to integrate them into the asset or project team to optimize the management of the drilling project and manage the identified risks so as to increase value.

COURSE CONTENT
- Overview of drilling project and risk management
- Cost versus value
- Contract models
- Project planning and design
- Planning software
- Drilling programming and analysis
- Tendering and contracting strategy
- Project finance and administration
- Supply chain management
- Reporting systems
- Communications and knowledge management
- Project closeout
- Management systems
- Introduction to risk management
- Risk management process
- Levels of risk management
- Operational risk assessments

AUDIENCE
Drilling managers, general managers, asset managers, project managers, finance managers, and project controllers with direct responsibility for, or involvement in, the management of resources with ongoing or planned drilling operations; senior drilling engineers, drilling superintendents, and drilling supervisors

PREREQUISITE
Basic drilling engineering, well planning

Stepping, Handling, & Lifting Techniques and Desk Ergonomics for Office Employees
Skill – 1 Day

The 1-Day course is designed to teach office workstation ergonomics and body control techniques that maximize an employee’s stability, balance, and control to minimize stepping, handling, and lifting injuries. The course will be hands-on skills training and will incorporate an assessment and optimization of office desk/workstation ergonomics.

COURSE CONTENT
- Workplace physiology and human body mechanics
- Prework warm-up exercises
- Stepping, handling, and lifting (SHL) body protection techniques
- Classroom practice and application of SHL techniques
- Application of observation/intervention and motivation in the office
- Workstation ergonomics
- Workstation assessment of ergonomic features

AUDIENCE
Any employee working in an office environment

PREREQUISITE
None
Stepping, Handling, & Lifting Techniques for Oil and Gas Operations Employees

Skill – 1 Day

This 1-Day course is designed to teach body control techniques that maximize an employee’s stability, strength, and control to minimize stepping, handling, and lifting (SHL) injuries. The course is a hands-on skills training and incorporate certain aspects of personal protective equipment use and the practice of observation/intervention with regard to SHL activities in an oilfield environment. The techniques are derived from the principles of human factors research, ergonomics, kinesiology, sports performance research, and martial arts.

COURSE CONTENT

• Value of teamwork to injury prevention
• Workplace physiology and human body mechanics
• Prewarm-up exercises
• SHL body protection techniques
• Classroom practice and application of SHL techniques
• Application of observation/intervention and motivation in the workplace
• Hand and boot safety emphasis
• Classroom practice in observation/intervention on SHL techniques
• Optional worksite practice in SHL techniques and observation/intervention techniques

AUDIENCE

Any employee working outside of the office environment

PREREQUISITE

None

Advanced Driving Skills Course

Skill – 3 Days

This 3-Day course is designed to develop deep understanding of advanced crash prevention concepts and techniques, as well as crash mitigation strategy and tactics, and to practice skills associated with evasive action maneuvers during high-stress driving situations. The course is conducted at Schlumberger’s Kellyville, Oklahoma, Driving Safety Track.

COURSE CONTENT

• Crash-free driving concept
• Video: "If Only"
• DriveSMARRT
• Local journey management plan
• Convoy management plan
• Pretrip vehicle inspection
• Driver ergonomics
• Alertness management
• Driving monitors
• Adverse conditions
• Imminent crash avoidance
• Skill assessment and commentary drive
• Performing the commentary drive technique with the driving coach
• Driving safety management policies and standards
• Fatigue management
• Seat belt issues
• In-vehicle coached driving practices: emergency skid response
• Head-on collision avoidance evasive actions
• Dropping-a-wheel reaction and control
• Emergency response practice
• Commentary drive #2
• Final assessment

AUDIENCE

Drivers of light vehicles (10,000 pounds or less)

PREREQUISITE

Valid driver’s license; driving experience and skills necessary to control a vehicle at high speed during high-stress simulations

Stepping, Handling, & Lifting Techniques for Oil & Gas Operations (INSTRUCTOR TRAINING)

Advanced – 5 Days

This 5-Day course is designed to train the candidate to effectively deliver a stepping, handling, and lifting (SHL) injury prevention course. This train-the-trainer course includes assessment and coaching (using videotaping) on presentation skills, as well as the technical aspects of the SHL techniques. The body control techniques maximize an employee’s stability, strength, balance, and control to minimize SHL injuries. Participants will learn to teach a course of hands-on skills training and incorporate certain aspects of personal protective equipment use and the practice of observation/intervention with regard to SHL activities in an oilfield environment. The techniques are derived from the principles of human factors research, ergonomics, kinesiology, sports performance research, and martial arts.

COURSE CONTENT

• Welcome and introduction
• Teaching HSE
• Presenting SIPP
• Discussion of the concept “working with the mind”
• Examination of the course materials for SIPP
• SIPP presentation techniques
• Summary of day 2 and the remainder of the course
• SIPP technique
• Behavior-based safety
• Notice of accident/investigation
• Ergonomics
• Review of the SIPP program
• The concept of “behavioral training” for office staff
• Assign final presentation topics
• Working with comments: process
• Working with comments: practice
• Working with comments: QUEST
• Practice presentations
• Final presentations
• Class wrap-up and presentation of certificates
AUDIENCE
Those who would lead the program of injury prevention training

PREREQUISITE
Previous HSE qualifications and experience and/or academic qualifications in kinesiology, physical therapy, or advanced medical training (medic, nurse)

Emergency and Crisis Management in the Offshore Oil & Gas Environment

Advanced – 4 Days

This 4-Day course covers the assessment, planning, prevention, and mitigation considerations for major consequence events in the offshore drilling and production realm. The course is designed around the threaded scenario of the Gulf of Mexico Macondo incident—an example of a catastrophic failure of a well-supported exploration well in a regulated basin. Threaded means the examples of Macondo are used in each topic to test the attendees’ confidence in their own procedures, processes, and planning. The course is heavily invested in participatory teamwork. There are 15 content modules, 13 workshops, 10 work product final documents, 5 videos, 3 hypothetical scenarios, and 2 structured class discussions. The course is most effective when the attendees all come from the same project, company, or joint venture.

COURSE CONTENT
• Introduction
• Perspectives on crises
• Consequences of disaster
• Autopsy on Macondo: What are our risks?
• The crisis management plan
• Crisis management fundamentals
• Risk: recognition
• Assessment
• Prioritization and prevention
• Crisis prevention
• Structural, behavioral
• Scenario exercise
• Where do we stand on crisis and business continuity readiness?
• Audit/assessment
• Culture
• Scenario final test
• What do we do now?
• Structure, training, planning

AUDIENCE
Wellsite team supervisors, especially offshore installation management, through corporate executive staff

PREREQUISITE
None
## Simulator Based Training - Drilling Engineering

Next’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked  while technical courses that use software have been marked  and the courses with practical sessions (either hands-on operational or software or both) are highlighted with  . There are some courses that use simulators and are highlighted with  .

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<th>Drilling Management Trainer (DMT)</th>
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<td><strong>ADVANCED</strong></td>
<td>IWCF Wall Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training</td>
<td>Managing Drilling Operations (with Drilling Simulator)</td>
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<tr>
<td></td>
<td>IWCF Surface Well Control Certification (Supervisors) Level-4</td>
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<tr>
<td><strong>SKILL</strong></td>
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SOFTWARE | Technical courses that use software

.includes practical sessions

FIELD TRIPS

USES SIMULATION

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Managing Drilling Operations (with Drilling Simulator)

**Skill – 5 Days**

This 5-Day course will use a computer-based drilling operations management simulator to drill a well in a virtual environment. Participants will role play key rig site jobs to construct a well following a drilling program. The simulator will provide virtual on-the-job-training by recreating the rig site setup of the driller’s station, a drilling supervisor’s station, and mud engineer’s station. A graphical interface will provide a window into rig floor operations for the entire class. The instructor will act as a mentor, offering group skills training across a wide spectrum of drilling activities within the simulated operational scenario.

**COURSE CONTENT**

- Simulator overview and familiarization
- Simulation 1: spudding the well and surface hole interval
- Simulation 2: intermediate hole
- Simulation 3: intermediate hole continued
- Simulation 4: production hole

**AUDIENCE**

Trainee wellsite supervisors, drilling supervisors, drilling engineers, directional drillers, and mud engineers

**PREREQUISITE**

Knowledge of drilling, drilling engineering, cementing operations, BHA design fundamentals, cementing program designs, rig awareness, and drilling operations

### IWCF Surface Well Control Certification (Supervisors) - Level 4

**Advanced – 6 Days**

This course is designed to fulfill the requirements for International Well Control Forum (IWCF) surface well control qualification. It is assumed that attendees taking this course fulfill the prerequisite requirements. The course is aimed at those individuals in well-control critical positions. Course content will be taught according to the IWCF syllabus and will prepare candidates for the IWCF examinations and assessment. The assessment consists of practical assessment using simulator equipment (type of simulator dependent on location of training), principles and procedures (P&P) written examination, surface well-control equipment written examination, and IWCF certificates that are valid for 2 years.

**COURSE CONTENT**

- IWCF Registration, Barrier, and Pressure Concepts
- Well barriers and standards
- Responsibilities for well control and integrity
- Well control definitions and concepts
- U-tube analogy for well pressure calculations
- Kick tolerance
- Kick causes, prevention, and detection
- Shallow gas and well control preparation
- Well shut-in procedures and first actions
- Gas Behavior and Well Control Procedures
- Gas behavior in Water Based Mud (WBM)
- Convention and unconventional well control procedures
- Well control complications
- Gas behaviors in Oil Based Muds (OBM)
- Vertical and deviated well control
- Well Control Equipment
- Review and selection of equipment
- Equipment installation and testing
- Practical – full scenario simulations with “unexpected events”

**AUDIENCE**

This course is intended for rig-site personnel in critical well control positions, office based engineers or supervisors who require IWCF certifications and persons who desire a thorough understanding of well control concepts.

**PREREQUISITE**

Participants in the course must have successfully completed and possess a Valid IWCF Introductory Well Control – Level 2 and Valid IWCF Well Control (Drillers) – Level 3 or Valid IWCF Well Control (Supervisor) – Level 4. Under special circumstances, dispensation to move from level 2 to level 4, or, to move direct to level 3 can be given. In both cases the candidate must have successfully completed an industry accepted/recognized training program such that they can pass a level 3 knowledge test at the accredited center prior to enrollment in this level 4 course.

### IWCF Well Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training

**Advanced – 4 Days**

This course is designed to fulfill the requirements for International Well Control Forum (IWCF) Well Intervention Pressure Control Qualification. It is assumed that the individual attending this course fulfills the prerequisite requirements of this course. The program is aimed at persons in pressure control critical positions. Candidates are required to complete the IWCF accredited training course prior to sitting assessment. Course content will be taught according to the IWCF Well Intervention syllabus and will prepare candidates for the IWCF examinations and assessment. Assessment consists of:

**COURSE CONTENT**

- Introduction
- IWCF Registration
- Course orientation & Initial Assessment (written examination)
- Equipment#1 – Completion Equipment
- Class Exercise#1 – Completion Equipment
- P&P#1 – Pressure Control Management
- Class Exercise#2 – Pressure Control Management
- P&P#2 – Barrier Principles
- P&P#3 – Well Information
• P&P#4 – Shut-in Procedures
• P&P#5 – Pressure Control Methods
• P&P#6 – Problems
• Class Exercise#3 – Barrier Principles, Well Information, Shut-in Procedures, Pressure Control Methods and Problems

• Equipment#2 – Wireline Equipment
• Class Exercise#4 – Wireline Equipment
• Equipment#3 – Coiled Tubing Equipment
• Class Exercise#5 – Coiled Tubing Equipment
• Equipment#4 – Hydraulic Workover (Snubbing) Equipment
• Class Exercise#6 – Hydraulic Workover (Snubbing) Equipment

• IWCF Assessment – Completion Equipment
• IWCF Assessment – Principles & Procedures
• IWCF Assessment – Wireline Equipment
• IWCF Assessment – Coiled Tubing Equipment
• IWCF Assessment – Hydraulic Workover (Snubbing) Equipment
• IWCF Assessment Re-sit (as required)

AUDIENCE
Well-site personnel in critical well control positions and office based engineers/supervisors who require IWCF certification.

PREREQUISITE
Valid IWCF Level 2 – Drilling and Wells Personnel Basic Training
AND
Valid IWCF Level 3 – Drilling and Wells Personnel Training
OR
Valid IWCF Well Control (Supervisor) - Level 4

Under special circumstances, dispensation to move from level-2 to level-4, or, to move direct to level-3 can be given. In both cases the candidate must have successfully completed an industry accepted/recognised training program such that they can pass a Level-3 Knowledge test at the accredited center prior to enrollment on this Level-4 course.
Simulator Based Training - Production Engineering

NEXT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with. There are some courses that use simulators and are highlighted with.

**Integrated Production and Well Operations Modeling**

*Foundation – 5 Days*

In this course, an oil well simulator is used to explain many operations that take place in a real well. This course/workshop consists of theoretical (50%) and practical (50%) sessions with experienced professionals.

The participants will simulate the operation of different artificial lift systems used to produce oil (Electric Submersible Pumps, Gas Lift, Progressive Cavity Pumps) under several operating conditions and its effect on the production system. Water and air are used to simulate two-phase flow (oil and gas).

The standard configuration of the Oil Well Simulator uses an Electric Submersible Pump with a Variable Speed Drive allowing the variation of the pump speed (RPM). This feature is used to optimize production and well performance. A “Work–Over” can be performed by changing the artificial lift system from ESP to Gas Lift.

**Course Content**

- Quiz
- Introduction to Oil Well Operations - Theory
- Oil Well Completions - Theory
- Inflow Performance Relationship (IPR) - Theory
- Visualization of the Oil Field System - Hands On
- Regular Well Test (Flow Rate and Bottom Hole Pressure): Darcy, Vogel, Combined - Hands On
- The participant will measure flow rate in the tank and bottom hole pressures using fluid levels in the well.
- Develop spreadsheets to do the IPR basic calculations – Exercise
- Calculate permeability of a porous media (longitudinal) and two porous media (parallel and series) using the simulator - Hands On
- Fluid Mechanics, calculation of down hole pressure exercised by a column of fluids, basics of two phase flow, pressure losses in pipeline - Theory
- Visualization of two phase flow in vertical, horizontal and inclined pipe and calculations of pressure drop using the simulator - Hands On
- Artificial Lift Overview: Rod Pumps, Progressive Cavity Pumps, Electric Submersible Pumps, Gas Lift, Hydraulic Pumps - Theory
- Experiment in the simulator natural flow and determine the IPR for different operational condition – Hands On
- Formation Damage - Theory
- Formation damage calculations using the simulator, determine productivity with damage in the formation. “Perform” coiled tubing acidizing job, determine productivity of the well after acidizing - Hands On
- Gas Lift demonstration, continuous and intermittent gas lift, plunger lift, different type of completions (open, semiclosed and closed) using the simulator, optimum injection rate, velocity string - Hands On
- Demonstration of slick line operations using the simulator - Hands On
- Choke in Pipeline, derivation of equation for one phase flow - Theory
- Electric Submersible Pumps (ESP), Standard Applications, Motor, Seal/Protector, Intake, Gas Separator, Pump, affinity laws - Theory
- ESP demonstration using the simulator, check for the pump correct rotation, pump-off, gas lock, dual completion (simultaneous and back up ESP and Gas Lift), hole in the tubing, pump running at different speeds - Hands On
- Effect of hole in tubing - Hands On
- Producing the fluids through two different permeability zones (parallel, series) using the simulator, calculate the average permeability for both cases - Hands On
- Producing the well with two different pay zones with different reservoir pressures and productivity index, demonstration of cross flow using the simulator - Hands On
- Hydraulic Pump System (Jet Pump), demonstration using the simulator - Hands On

**Audience**

Technicians, Supervisors or Engineers with little or no prior knowledge of oil well operations.

**Prerequisite**

Participants should be familiar with basic Production Engineering, have some field experience in Production and basic knowledge of artificial lift systems. Basic understanding of well completions and operations.
Software courses use software
Includes practical sessions
Field trips
Technical courses that use software

Simulator Based Training - Surface Facilities

NEXT’s curriculum provides courses for technical and nontechnical professionals at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked while technical courses that use software have been marked and the courses with practical sessions (either hands-on operational or software or both) are highlighted with . There are some courses that use simulators and are highlighted with .

**DOMAIN**

<table>
<thead>
<tr>
<th>COMPETENCY LEVEL</th>
<th>DSS-100 Dynamic Simulator System</th>
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<tbody>
<tr>
<td>FOUNDATION</td>
<td>Introduction to Oil Field Surface Facilities Operations with Simulator</td>
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**Introduction to Oil Field Surface Facilities Operations with Simulator**

*Foundation – 5 Days*

This course will introduce the trainee to the basic types of equipment and mechanical systems used in oil and gas production facilities. The objective is to develop an understanding of the function and control of key equipment. It includes a substantial simulation component to enhance understanding of production system operation and performance.

**COURSE CONTENT**

- Introduction to Basic Equipment and Systems for Oil and Gas Production
- Overview of Oil and Gas Production Systems
- Pumps
- Tank Systems
- Troubleshooting Pump and Tank Systems
- Compressor Operation
- Reciprocating Compressors
- Centrifugal Compressors
- Troubleshooting Compressor Operation
- Instrumentation and System Control
- Introduction to Instrumentation
- Troubleshooting Instrumentation
- Process Control
- Well System Control
- Diagnosing Control Issues
- Well System Operation
- Introduction to Production Operations
- Monitoring Well Operation
- Alarms and Interlocks
- Abnormal Situation Management
- Well System Operation (Cont.)
- Optimizing Well Production
- Troubleshooting Production Issues
- Environmental System Operation

**AUDIENCE**

This class is aimed at entry level of operation engineers and technician

**PREREQUISITE**

None
Simulator Based Training - Business Simulator

NExT's curriculum provides courses for technical and nontechnical professional at all experience levels. The course matrix below organizes the curriculum by course focus and competency level. You can use this matrix to find the right course and build your training plans. Software and Domain courses are listed separately in their respective sections, please click on the interested tab to see all the courses under the corresponding discipline. Field trips are marked 🔴, while technical courses that use software have been marked 📊, and the courses with practical sessions (either hands-on operational or software or both) are highlighted with 📚. There are some courses that use simulators and are highlighted with 🎮.

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<tr>
<th>COMPETENCY LEVEL</th>
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<th>OilSim</th>
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<tr>
<td>SKILL</td>
<td>Petroleum Geopolitics with OilSim</td>
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<td>FOUNDATION</td>
<td>Introduction to Geology with OilSim</td>
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<td>Introduction to Management of E&amp;P Business with OilSim</td>
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<td>Introduction to Geophysics with OilSim</td>
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<td>Project Management Fundamentals</td>
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<td>Introduction to Shale Reservoirs</td>
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<tr>
<td>AWARENESS</td>
<td>Oil and Gas Business Simulation with OilSim</td>
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<td></td>
<td>Introduction to Petroleum Exploration and Production with OilSim</td>
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Introduction to Petroleum Exploration and Production with OilSim

Awareness – 5 Days

Level course is designed to expose the attendees to the full life cycle of the oil and gas industry to increase understanding of the functions of companies and their roles and responsibilities. It provides an overview of technologies, workflows, and processes that enable exploration, appraisal, development, and production of hydrocarbons as well as the risks, rewards, and their social, environmental, and financial impacts. OilSim® upstream learning simulator, a learning platform that enables teams to assume the roles of oil and gas companies and authorities, will be used in a competitive, friendly teamwork environment. Expert facilitators guide attendees, helping them to learn by actively making decisions in a virtual, realistic business environment.

COURSE CONTENT

- Introduction and Exploration
- Exploration and drilling
- Appraisal and field development planning
- Facilities planning and construction
- Producing and summary

Challenge modules include finding blocks, prioritizing blocks with CRS, use of 2D seismic and bidding, appraisal drilling, depletion planning, construction project planning, construction project execution, and operations. The course will end with team reflections on all learning modules and on OilSim simulator.

AUDIENCE

Individuals involved in any capacity in the oil and gas industry

PREREQUISITE

None

Oil and Gas Business Simulation with OilSim

Awareness – 2 Days

This 2-day course is designed to enhance understanding of the entire petroleum exploration and production value chain, including geoscience, engineering, and economical perspectives, enabling attendees to explain the overall oil and gas exploration, development, and production process. OilSim® upstream learning simulator, a learning platform that enables teams to assume the roles of oil and gas companies and authorities, will be used in a competitive, friendly teamwork environment. Expert facilitators guide attendees, helping them to learn by actively making decisions in a virtual, realistic business environment.

COURSE CONTENT

Module challenges include

- Initial screening to identify sedimentary basins using gravimetric and magnetic surveys
- Prospecting to find the best acreage, determine a bidding strategy, and win the bid using environmental surveys, regional geological maps, 2D seismic surveys, and topographic maps
- Exploration drilling to determine if the block contains oil and/or gas in commercial quantities, negotiate to share the risk, study 3D seismic surveys, assess environmental impact, contract drilling rigs and service providers, make a budget, and study the results from drilling
- Reservoir depletion plans using reservoir characteristics, nodal analysis, and production profiles
- Facilities plan to process and transport the oil and gas from the reservoirs using metrological surveys, production platforms, pipelines, and flowlines
- Construction project
- Production of the oil and gas for the lifetime of the asset

AUDIENCE

Individuals working in or around the oil and gas industry with a need for an overall understanding of upstream value chain.

PREREQUISITE

Background, degree, or experience in geosciences, engineering, or finance, accounting, etc. is preferred but not necessary.

Introduction to Shale Reservoirs

Foundation – 5 Days

This 5-Day course provides attendees with focused instruction on the geological, geophysical, and petrophysical attributes of shale reservoirs, including the origin and accumulation of natural gas and liquids. Participants will be exposed to the methods and workflows for identifying and characterizing shale reservoirs. They will build on this foundation to learn about the engineering aspects of shale hydrocarbons exploitation. Participants will gain an understanding of methods and workflows for developing shale hydrocarbons resources, including horizontal well architecture and placement, completions, hydraulic fracturing, and production. This course uses OilSim® (upstream learning simulator), a learning platform in which participants are divided into teams, take on the roles of oil and gas companies and authorities involved in shale reservoir exploitation, and learn through actively making decisions in a virtual, realistic business environment.

COURSE CONTENT

- Exploring shale reservoirs
- Geologic considerations
- Exploration considerations
- Geochemical: total organic carbon and thermal maturity
- OilSim challenge 1
- Appraising shale reservoirs
- Formation evaluation
- Geomechanics
- OilSim challenge 2
- Drilling shale reservoirs
- Reservoir quality considerations for borehole placement
- Rig technologies
- OilSim challenge 3
- Completing and stimulating shale reservoirs
- Completions
- Fracturing and fracture evaluation
- Water cycle
- OilSim challenge 4
- Producing from shale reservoirs
**AUDIENCE**
Petroleum engineers, geoscientists, and managers wanting to gain a good understanding of characterizing and developing shale reservoirs

**PREREQUISITE**
One year or more in the oil and gas industry

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**Project Management Fundamentals**
*Foundation – 5 Days*

The practical application of standard project management methodology will be enhanced with a workshop approach, the use of participant case studies for practical exercises, and a project simulation. This course will follow the guidelines established by the Project Management Institute (PMI) and its Project Management Body of Knowledge (PMBOK® Guide), 5th edition. The course provides attendees with the ability to apply project management best practices in initiating, planning, executing, and closing a project. During the workshop, participants will develop a project charter, perform a stakeholder analysis and use it in developing a communication plan, develop a work breakdown structure, and conduct a risk analysis. Additionally, participants will learn effective techniques for monitoring and controlling a project, as well as how to capture project lessons learned. This course satisfies the Project Management Professional (PMP®) certification 35-hour training requirement.

**COURSE CONTENT**
- Project management overview and project initiation
- Project management and the project life cycle
- Initiating a project
- Developing a project charter
- Identifying and establishing a project governance
- Project planning
- Stakeholder analysis and communication planning
- Scope definition
- Develop a work breakdown structure
- Determining critical path and float
- Project planning and project execution
- Planning for quality
- Procurement planning
- Project risk analysis
- Project change control
- Project execution simulation and project monitor/control
- Project simulation game
- Project monitor/control and project closing
- EVA analysis
- Project quality reviews
- Closing processes and conducting lessons learned
- Organizational change management

**AUDIENCE**
Project managers who desire an increased understanding of how to successfully manage a project based on the PMI project management methodology

**PREREQUISITE**
None

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**Introduction to Geophysics with OilSim**
*Foundation – 4 Days*

The 4-Day course will introduce E&P professionals to the key concepts and principles that form the basis for value-added geophysical applications in exploration, field appraisal, and reservoir management. Learning objectives are at basic awareness to knowledge levels. Emphasis is on practical understanding of seismic acquisition, processing, imaging, interpretation, and prediction of geological and petrophysical properties from seismic. Data examples, videos, exercises, and workshops are used to illustrate key concepts. Practical issues and pitfalls be covered since they affect the application of geophysical data and information in E&P workflows. The practical aspects of seismic interpretation are covered with examples that involve seismic structural mapping, stratigraphic analysis, and amplitude/attribute methods. The course includes online simulation with OilSim upstream learning simulator.

**COURSE CONTENT**
- Introduction
- Role of geophysics in the E&P business
- Multiclient seismic
- Overview of geophysical techniques
- Geophysical industry - competitive landscape
- Nonseismic methods: gravity, magnetic, electromagnetic, borehole methods
- Seismic methods
- Geophysical interpretation products
- Seismic interpretation pitfalls and challenges
- Seismic fundamentals
- The seismic experiment
- Reflection and refraction
- Seismic wavelet
- P and S waves
- Snells Law
- Multifold acquisition
- Seismic velocities
- OilSim challenge 1: finding basins
- Marine Seismic Acquisition
- Marine sources: airguns
- Bubble effect
- Simultaneous sources
- Seismic recording systems
- Hydrophones and streamers
- Streamer steering
- Over/under acquisition
- Single sensor and time lapse
- Wide azimuth and coil acquisition
- Seismic acquisition QC
- Land seismic
- Impact of near surface on data quality
- Land seismic sources - dynamite and vibrosis
Simultaneous sources
Acquisition design
Geophones and arrays
Land seismic operations
Land seismic acquisition QC
Borehole seismic acquisition
Borehole geophysical principles
Field technology
Checkshots and VSPs
Seismic while drilling
Cross-well seismic
Passive seismic
Data Conditioning
Near-surface corrections
Noise attenuation
Multiple attenuation
Wavelet shaping
Regularization
Velocity modeling
Imaging
OilSim simulator challenge 2: prospecting
Interpretation of geophysical data
Trap definition
Synthetic seismograms
Structural mapping and contouring
Seismic stratigraphy
Amplitudes and attributes
Attributes, AVO and inversion
OilSim simulator challenge 3: exploration drilling
Summary

AUDIENCE
Entry-level geoscientists, geologists, engineers, and other E&P staff with a need for an overview of seismic and geophysics techniques and applications

PREREQUISITE
Basic knowledge of subsurface geology

Introduction to Management of E&P Business with OilSim

Foundation – 5 Days

This 5-Day course is designed to enhance knowledge and understanding of the entire oil company decision-making process, from initial new country entry strategy to field abandonment, and the typical business and economics framework of oil companies. It covers the technical and business challenges as well as the interactions with fiscal and government bodies.

Relevant industry case studies and success stories will be reviewed throughout the course. Attendees will gain an understanding of asset management throughout the life cycle, which will be reinforced using oil and gas challenges practiced via computer simulation. They will learn how corporate strategy affects the management of upstream assets, how oil companies identify risks and use petroleum economics to develop successful exploration programs, the importance of reserves classification and the purpose of reservoir appraisal, and construction and project management.

In some locations, the course may run for 4 days.

Course Content

- Macro-economics and corporate strategic responses
- Three tests of strategy
- Internal and external factors impacting the value of assets
- Fiscal regimes
- Simulated challenge: finding the sedimentary basins using geophysical techniques in a simulated challenge to find the best exploration blocks
- Petroleum systems
- Geophysical methods
- Exploration as a process and successful exploration strategies
- Petroleum economics
- Simulated challenge: Prospecting for oil and gas
- Drilling reserves classification
- Reservoir appraisal
- Simulated challenge 3: Exploration and appraisal drilling
- Field development
- Simulated challenge: Depletion plan
- Facilities
- Simulated challenge 5: Facilities plan
- Construction and project management
- Simulated challenge: Construction project
- Production
- Simulated challenge: Production operations
- Maximizing value
- Abandonment

Further reading will be suggested for additional understanding of asset management.

AUDIENCE
Individuals with a need for an increased understanding of the management of upstream oil and gas assets.

PREREQUISITE
Background, degree, or experience in the geosciences, engineering, or finance, accounting, etc. is preferred but not necessary.

Introduction to Geology with OilSim

Foundation – 4 Days

This 5-Day course will cover the key concepts and principles of geology as applied to the oil and gas industry, summarize the fundamentals of geology to integrate it in the processes of petroleum exploration, development, and production. Using the OilSim upstream learning simulator modules, attendees will experience the essentials of basin exploration, drilling location evaluation from a geological perspective, and some
of the business aspects of getting their first well drilled.

COURSE CONTENT
- Introduction (course objectives, history and economics of petroleum, Prudhoe Bay example)
- Geology (principles, Earth structure and plate tectonics, geological time and age dating, major rock types)
- Structural features (structural style and stress fields; folds, faults, unconformities, and fractures; structural and hydrocarbon traps)
- Clastic depositional systems
- Carbonate depositional systems
- Carbonate and clastic systems contrasts
- Geologic mapping and cross sections
- Mapping and contouring concepts
- The petroleum system
- Correlation and stratigraphy
- Principles of correlation (use of wireline logs, approaches, lithostratigraphy and chronostratigraphy, sequence stratigraphy, and seismic stratigraphy & biostratigraphy)
- Pore systems and diagenesis
- Geological modeling
- Unconventional Resources
- Seismic methods and petroleum geology
- Basics of wireline logging and interpretation
- Exploration challenges: exploring sedimentary basins, obtaining a license, partnerships and farm-ins

AUDIENCE
Entry level to mid-level engineers, geoscientists, and other E&P staff with a need to understand the role geology plays in their everyday business activities

PREREQUISITE
None

Petroleum Geopolitics with OilSim

SKILL – 5 Days

Geopolitics has a fundamental effect on the level of global oil production and the access to oil. With major changes in the frames of oil production, uncertainty about regimes and volatile oil prices, the impact of geopolitics and political understanding of the oil scene is more important than ever.

This program explores the political elements in the process of oil and gas exploration licenses and continuous development of the oil industry. It gives the participants the tools to identify the players in the field, where to find relevant information and to analyze the relevant geopolitical situation for a given exploration bid or the long term strategy of a company, institution or organization.

Using our OilSim learning platform, participants are divided into teams and take on the role of an Oil Company, either a private local or international oil company (IOC), a national oil company (NOC), or a Ministry of Oil in a fictitious country. Teams work their way through the challenges with the emphasis on consideration of the geopolitical situation, to gain the best possible outcome for their company or country.

COURSE CONTENT
- International Relations & Energy Politics
- International relations overview

PREREQUISITE
None

Oilsim Challenge 1, 2 & political simulation - challenge 1
- International Organizations in the Energy Area
- Oil Companies & Oil Administrations
- Private and national oil companies
- OilSim challenges 3-4 & political simulation - challenge 2
- National Oil & Energy Administrations
- Understand the actors in the field and their role and goals.
- Energy as a Political Tool
- OilSim challenge 5-6 & political simulation - challenge 3
- The use of energy in international politics
- The use of energy in national politics
- Foreign Relations & Oil Companies
- Oil companies in international relations
- Political simulation - challenge 4-5
- Safety and Security in oil and gas production
- The Global World
- Understand the interaction between domestic and International politics
- Political simulation – challenge 6-7
- The Global world

AUDIENCE
Professionals empowered with strategic planning, business development and investment responsibilities that need to understand the current geopolitical climate affecting the global Oil & Gas market.

PREREQUISITE
None
IMMERSIVE LEARNING PROGRAMS

To meet the educational and career-advancement needs of oil and gas professionals worldwide, and to enhance E&P professionals’ core competencies, NExT offers comprehensive, customized training programs that fit the needs of your organization. Covering the entire breadth of the E&P domain, NExT builds development programs that span core industry disciplines and challenges that include:

- Petro-Technical
- Facilities/Operations & Maintenance
- Management, Economics and Finance
- Health, Safety and Environment (HSE)
- Schlumberger Software
- Technical Challenges

NExT has more than 450 course offerings that include technical and software courses, integrated training programs, software certification and in some cases, credit towards master’s degrees* (*Some program participants may receive master's degrees from Heriot-Watt University if the programs are certified by that university or academic credit). Competency management services include initial assessments, competency gap analysis, curriculum development and training to fill assessed gaps in employee competencies as well as follow-up verification to quantify improvements from training using NExT Competency assessment Software ComAs).

COMPETENCY MANAGEMENT

DEVELOP TECHNICAL TEAMS FOR TARGETED GROWTH

An E&P organization’s development activity, growth plans, and ultimately its performance, depend on a talented, technical workforce. To be successful, business leaders must synchronize technical talent — the combination of skills, job capability, and knowledge — with business strategy. Competency management is the best way to ensure that synchronization. Through assessment, training, and testing, competency management matches each asset teams’ skills to the company’s needs and goals.

NExT DELIVERS COMPETENCY MANAGEMENT

For more than 15 years, NExT has helped E&P organizations and professionals worldwide assess their talent, design training programs, and develop world-class technical capabilities. NExT has delivered oil and gas competency management projects for small teams and for hundreds of people spanning multiple asset teams. NExT’s comprehensive E&P expertise includes:

- Geology
- Geophysics
- Petrophysics
- Geomechanics
- Drilling Engineering
- Reservoir Engineering
- Production Operations
- Production Engineering
- Surface Facilities
- Business & Management
- Economics
- Project Management
- Unconventional Assets
- Information Management
Customized Curriculums

CUSTOMIZED PROGRAMS FOR YOUR ASSET TEAMS

Every asset team, like every asset, is unique. NExT designs training programs using a blended learning approach, a global training network, and advanced training centers to align with your strategic objectives and maximize your programs business impact.

BUSINESS DRIVEN CURRICULUMS

NExT builds training programs that start with your strategic business objectives and experience level of the intended participants. From accelerating the understanding of new engineers and geoscientists to transforming an experienced asset teams expertise, NExT designs training focused on delivering learning that develops your team to match your business needs.

BLENDED LEARNING APPROACH

NExT blends or combines the best learning approach to achieve the results that you expect. Leveraging a catalog of more than 340 courses, NExT builds a unique program progression including expert-led training, software tools and workflows, hands-on field courses, operations assignments, on-the-job projects, self-learning exercises, and research and technology center tours.

ON-THE-JOB TRAINING

On-the-job training programs are available for individuals or for groups of customers and include a permanent or time-structured mentor. Students perform real job tasks with their own data, accelerating time to autonomy.

Multidomain Shale Training Program

‘Open for group enrolment from companies only’

Successfully and economically characterizing, completing, and producing complex shale reserves demands a thorough understanding of science, fit-for-purpose technology, and specialized expertise. Developing and honing that expertise is a challenge facing asset managers everywhere. The Multidomain Shale Training Program from NExT, a Schlumberger company, is the fastest, most effective way of equipping your team with the knowledge necessary to efficiently and properly identify and develop unconventional plays. Learn about these complex reserves from industry experts with decades of experience as well as by modeling actual shale prospects, visiting core laboratories, taking field trips, and ultimately presenting a pilot project developed in class.

A PROVEN FORMULA FOR ACCELERATED SHALE DEVELOPMENT

The Multidomain Shale Training Program is divided into two modules: Geoscience and Engineering. Both include common workflows, simulations using field data, and courses that enhance the competencies and skills needed to work effectively in multidisciplinary shale teams. During the 12-week program, your teams will

• Gain essential scientific knowledge
• Get hands-on exposure to a wide range of software, laboratory techniques, tools, and field-technology applications
• Visit relevant Schlumberger research, testing, and operations centers
• Apply their learning to a real-world project.

BENEFITS FOR YOUR PEOPLE AND ORGANIZATION

Upon completion of NExT’s Multidomain Shale Training Program, geoscientists and engineers will have the knowledge necessary to work in teams to

• Map, model, and characterize sweet spots
• Identify well spacing and pad locations more accurately
• Place wells and extract hydrocarbons at a lower cost and with a greater overall success rate
• Optimize well designs and drilling trajectories

Enhance completion and stimulation strategies
• Improve operational efficiencies
• Prevent environmental impact.

Integrated Field Development Program

‘Open for group enrolment from companies only’

NExT offers practical field development plan (FDP) training that accelerates and transforms technical skills. It builds expertise in FDP techniques, tools and workflows that are needed to address the challenges of field developments. This training is unique because it includes theory, software training, model building, workflows, and an in-class project designed to reinforce lessons and demonstrate the acquired practical skills and understanding.

The immersive, comprehensive curriculum starts from general understanding and extends to in-depth field assessment with economics, risk, and standard analysis techniques that provide a complete understanding of FDP.

Field development is becoming much more complex and expensive, so getting it right is critical. NExT offers four different FDP programs, each providing the opportunity to learn fundamental approaches in developing and working on FDP. The program incorporates the latest technologies and software to enable customers to design a suitable, long-term, and profit-table development strategy.

Subsurface Integration Program

‘Open for group enrolment from companies only’

A fit for purpose blended skills enhancement program that teaches participants cross-discipline skills to develop well recommendations, exploitation opportunities, remedial prospects and reservoir characterization solutions. Participants learn by integrating well log interpretation, petrophysical rock types and flow units based on their own projects or fields. Participants demonstrate expertise by developing and recommending actual value added opportunities.

PROGRAM WORKFLOW

• Integrates expertise and data including the geological framework, pore-geometry, petrophysical rock types, formation evaluation and determining flow units. These elements are summarized as developing the static model.
• NSIP participants build the foundation to the static model.

International Oil & Gas Management Program

‘Open for group enrolment from companies only’

An immersive 7 week program intended for line and asset managers who manage technical teams seeking to understand Oil & Gas Asset Management including E&P Processes and Governance, Strategic Planning, Asset Management, Project Management, Technology Management, Technology Trends, Finance, Economics, Risk, Mergers & Acquisitions, Leadership, and Business Simulation. Participants learn through expert-led instruction, Product Center Tours, and a collaborative business simulation project.

Subsurface Engineering for New Hires

‘Open for group enrolment from companies only’

A hands-on seventeen-week engineering program that accelerates new recruit understanding on the domains of drilling and completions operations using hands-on learning in regional research centers, manufacturing centers, classrooms, laboratories, and simulators. Students learn to design drilling programs, completion operations and see firsthand how designs are implemented in an operational setting.

Visit NExTTraining.com/classes for the latest calendar or to register for a course.
Unconventional Resources Program

‘Open for group enrolment from companies only’

A cross discipline program that teaches engineers and geoscientists the essential workflows used in exploitation, evaluation, and field development planning of unconventional assets. The program curriculum is tailored to your asset teams to include a mix of learning options including field courses, classroom learning, and hands-on software training.

Production Optimization

‘Open for group enrolment from companies only’

A cross discipline program that teaches engineers and geoscientists the essential workflows used in exploitation, evaluation, and field development planning of unconventional assets. The Production optimization program is focused on results and is based in learning-by-doing. Participants work in teams, applying their learning to previously select mature reservoirs, detecting opportunities for productivity enhancement and actively contributing to production increase.

The objective of the program is to train engineers and at the same time increase the cash flow of the operator, increasing incomes and reducing costs associated to the barrel produced through the development of productivity integral engineers oriented to:

- Integral analysis of well-producing systems (drainage area, completion, production method, production tubing, lines and collection network, separation station)
- A Multidisciplinary approach and pro-active effort in selecting opportunities
- Early integration of new technologies in the implementation of solutions with specialized engineering and operational support
- Quick identification and optimization of the productivity of wells with anomalous behavior

Fresh-out/Student Intern Integrated Training Program

Schlumberger currently offers one of the most comprehensive training programs for our employees and with this mindset NExT has put together an integrated training program for your new hires and/or student interns to assist them to integrate to your business efficiently and with the proper balance of skill set.

The program has been designed to expose your new hires and interns to the full life cycle of the oil and gas industry while accelerating their understanding of the different domains through classroom sessions to cover theory, software applications followed by field trips and/or technology center tours to increase their exposure to field operations. Our program is flexible and fit for purpose, it allows your new hire or intern to build their own training blocks based on their domain while giving them the option to complete all the modules for a more comprehensive understanding of the industry.

The combined modules will provide your new hire / student intern a comprehensive understanding of all the components required for the production and evaluation of your assets. The objective of our program is to be fit for purpose therefore we also offer the option of combining different modules to maximize the learning experience, for example:

**Exploration and Production On-Line + Newcomer Employee Workplace HSE + Drilling and Completions + OilSim**

In order to allow the students to reinforce what they have learned and be able to apply and demonstrate their acquired practical skills, we have included the following as part of the training program:

- Software license for each individual enrolled in one or more non-core modules for the duration of their internship and/or for a maximum of four months for new hires.
- One-on-one mentorship after the modules have been completed (for a maximum of eight hours and for components covered on this program only)
ELECTIVE TOPICS (Participants select one)

- Accounting
- Alliances and Partnerships
- Economics
- Marketing
- Mergers and Acquisitions
- Negotiation
- Organizational Behavior
- Strategic Risk Management

Petroleum Engineering

MSC DISTANCE LEARNING PROGRAM FROM HERIOT-WATT UNIVERSITY AND NExT

NExT, in partnership with Heriot-Watt University, is pleased to offer Distance Learning students of the University and potential students the option of covering the curriculum in 5-Day session in Abu Dhabi, UAE. Upon successful completion (completing exams) of the program, graduates earn the industry recognized Master of Science degree in Petroleum Engineering from the Heriot-Watt University.

5-Day instructor-led classes are scheduled every year in Abu Dhabi. The aim is to cover the curriculum per course in these 5-Day sessions. Tips for successful completion is also covered during the sessions, thereby increasing the chances of success and enhancing the learning experience.

Applicants must complete an online application but also put a note on their application form saying that they wish to study the program through NExT in Abu Dhabi.

PROGRAM BENEFITS

- The option to earn a Petroleum Engineering Masters degree while maintaining full time employment.
- Interacting in person with the Heriot Watt faculty professors and industry experts as a Distance Learning student.
- Collaborate and share ideas with students from a diverse, global background.

HOW DOES IT WORK?

NExT conducts 5-Day workshops in Abu Dhabi that cover the requisite module topics. Students are expected to attend these sessions, submit assignments as required, and take a proctored exam in an approved testing location.

PROGRAM STRUCTURE

The Program consists of a total of eight modules, a Field Development Project (FDP) and an individual research project.

The eight modules include:

- Drilling Technology (Well Design and Construction Engineering - Heriot-Watt University Program)
- Geology (Petroleum Geoscience - Heriot-Watt University Program)
- Production Engineering (Production Technology - Heriot-Watt University Program)
- Reservoir Engineering (Principles of Reservoir Engineering - Heriot-Watt University Program)
- Reservoir Engineering Well Test Analysis (Fundamentals of Well Testing - Heriot-Watt University Program)
- Reservoir Engineering (Reservoir Simulation - Heriot-Watt University Program)
- Management and Economics (Petroleum Economics - Heriot-Watt University Program)
- Petrophysics (Formation Evaluation - Heriot-Watt University Program)
- Field Development Project
- Individual Research Project

Complete program details can be found at the Institute of Petroleum Engineering’s website.

ENTRANCE REQUIREMENTS

Students wishing to apply to the program require a Degree in engineering or a science discipline. Minimum English scores of TOEFL 550 (manual) or 213 (computerized), or IELTS 6.0 are required. If you have completed your undergraduate degree in English or work in a company where English is the primary language used then you are not required to submit TOEFL or IELTS scores.

DOCUMENTS REQUIRED

- Engineering Degree Transcript
- Application Form - You can complete the online application form using Heriot-Watt University’s “How to Apply” instructions here

FEES

- The fee per short course is 5,200 US$.
- There are a total of 8 short courses; students may choose to attend some or all of the courses.
- It is, however, mandatory to pass the exams for all modules to obtain the MSc. in Petroleum Engineering.
- These short courses are aimed at enhancing the learning experience and improving your rate of successful completion of each module.
- The short courses cover the entire curriculum in 5-Day and offer exam tips to successfully complete the exams.

COMPETENCY ASSESSMENT

IMPROVED PERFORMANCE THROUGH STRATEGIC TAILORING

Using a proven, scalable, five-step process, NExT delivers competency management projects customized to each company’s unique needs at different scales – from accelerated team development projects spanning several weeks to immersive programs following asset teams through multiple assignments.

STRATEGY

A sound strategy that considers organizational needs, business direction, competency goals, and job profiles is developed to build detailed job and assignment descriptions.

COMPETENCY DEVELOPMENT

Using strategy inputs, a customized competency model is developed per relevant discipline and technology with a defined proficiency for each level.

IMPACT

To verify the impact of the training, an assessment is repeated and compared to the initial assessment. Further recommendations are provided to ensure that each team’s technical skills help drive company performance.

TRAINING

Targeting identifies technical gaps, a training program is designed to develop and implement the fastest path for each team’s development.

ASSESSMENT

Through a combination of self-assessment, testing, and individual interviews by technical experts and qualified assessors, a comprehensive organization health check is completed, providing an actionable snapshot that includes strengths, technical gaps, and areas for improvement.

Visit NExTtraining.com/classes for the latest calendar or to register for a course.
Professional Certifications for Schlumberger Software

Demonstrate proficiency in the Petrel or Studio software platforms

**BENEFITS**

Certification provides the following for both professionals, corporations, and students:

- Validates software skills and petrotechnical knowledge, from fundamental to advanced.
- Global recognition with industry-recognized standards.
- Assessment of essential skills to determine training needs, as well as career readiness and progression.

**LEVELS AND DISCIPLINES**

Two levels of certification tests are offered—Specialist and Expert—in the following disciplines:

- Petrel Geology & Modeling
- Petrel Geophysics
- Studio & Petrel Data Management

**INDUSTRY-STANDARD CERTIFICATION**

Certification exams were developed in conformance with industry-recognized standards. Testing is provided through Prometric, a global testing service provider.

**LOCATIONS AND FEES**

All exams are administered at Prometric testing centers. Prometric operates testing centers in more than 160 countries. You can locate the center closest to you on the Prometric Website. The testing fee is USD 100 for Specialist level exams and USD 150 for Expert level. No exams are conducted at Schlumberger offices.

**EXAM FORMAT**

Each exam contains 125 multiple choice questions and will be the same regardless of location. Exams are currently offered in English only. The certification is valid for a 3-year period from the date of successful completion.
For a comprehensive portfolio of courses covering a broad spectrum of disciplines, visit NExTtraining.com