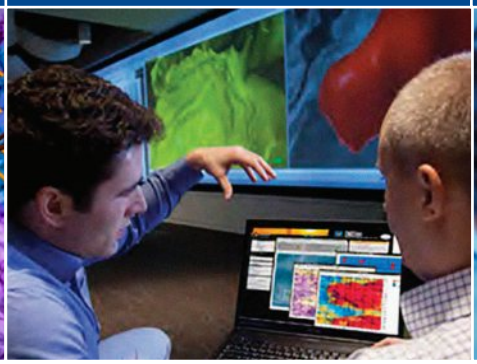
NExT
A Schlumberger Company

Oil & Gas Training
and Competency Development

2018
COURSE CATALOG

Complete Suite of Training and Competency Development

COURSE OFFERINGS	IMMERSIVE LEARNING PROGRAMS	COMPETENCY MANAGEMENT


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 and Localization Award in 2016, 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.

getenergy
GLOBAL EDUCATION & TRAINING FOR ENERGY

Winner:
2013, 2014, 2015 Getenergy Training Provider of the Year Award
2016 Getenergy Localization Award

CONTENTS

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 .

DOMAIN | SOFTWARE

COMPETENCY LEVEL	Reservoir Characterization	Reservoir Production	Reservoir Management
SKILL	Conducting an Integrated Reservoir Study		
FOUNDATION	Introduction to Geoscience		
	Introduction to Petrophysics-Including Traditional and Reservoir Petrophysics	Introduction to Production Engineering	Mastering Finance for Non-Financial Oil and Gas Personnel
	Fundamentals of Coal Seam Gas (CSG) Development	Introduction to Field Development Planning	Introduction to Management of E&P Business with OilSim
	Prospecting and Producing of Geothermal Energy		
	HSE in Exploration and Production		
AWARENESS		Introduction to Drilling	Introduction to Petroleum Economics
	Reservoir Engineering for Non-Reservoir Engineers		
	Project Management for Team Members		
	Upstream Business Basics with OilSim		
	Introduction to Petroleum Exploration and Production with OilSim		
	Petroleum Exploration and Production		
	Exploration & Production On-Line		

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 .

DOMAIN | SOFTWARE

Petrel	Techlog	ProSource	Merak	PIPESIM	OFM	COMPETENCY LEVEL
		ProSource Front Office Fundamentals				**SKILL**
Petrel Exploration Geology: Petroleum Systems Modeling Fundamentals	Studio for Techlog Users		Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course	PIPESIM Fundamentals	OFM Fundamentals Using Gas Operations Examples	**FOUNDATION**
Studio for Petrel Users					OFM Fundamentals Using Oil Production Examples	
Petrel Shale Fundamentals					OFM Fundamentals	
Petrel Fundamentals	Techlog Fundamentals				OFM Analysis Dashboard	**AWARENESS**

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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
- Interaction with other disciplines
- 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
- 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.

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 material, exercises, class discussions, team presentations, and an interactive challenge.

COURSE CONTENT

- Cash flow basics
- Calculating revenue
- Estimating expenditures
- Fiscal systems
- 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

Awareness – 3 Days

This course 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.

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
- Well and Reservoir Concepts
- Reservoir Rock Properties
- Fluid statics and fluid distribution
- Reservoir drive mechanisms
- Oil and gas well performance
- Oil displacement concepts
- Well Testing and Analysis
- Well Decline Curve Analysis
- Material Balance Concepts
- 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

Awareness – 2 Days

This course, delivered by a Project Management Institute (PMI) education provider, will provide attendees with 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 provides a good basis for any person seeking future career advancement as a team leader or project manager. It also establishes 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 specific needs of a customer.

COURSE CONTENT

- Define a project and project management
- Define the difference between projects and operational work
- Explain the relationship of the project management Triple Constraint triangle
- Identify the key components of the project life cycle and expectations of team members in each phase
- Identify 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

Anyone with a minimal background in project management or someone who desires

an increased understanding of how to participate successfully in a project.

PREREQUISITE

None.

Upstream Business Basics 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 interpret geophysical, geological, and engineering data used in exploration, development and production assess the economic viability of reservoirs understand elements reservoir depletion, including secondary recovery issues compare and evaluate different field development designs create field development project plans and understand the practical implications when implementing the plans understand the implications of different decisions in the operations phase. Attendees will be grouped in teams and challenged to explore and discover oil and gas, create and implement a field development plan, and operate the well until abandonment. An experienced OilSim 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.

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 and 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.

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.

Exploration & Production On-Line

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
- Field Development Planning
- Drilling Overview - Personnel and Equipment
- 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 supervisors, E&P financial, administrative, and legal personnel, midcareer managers new to the industry, senior administrative support personnel.

PREREQUISITE

None.

Introduction to Geoscience

Foundation – 5 Days

The objective of this 5-day course is to introduce attendees from disciplines other than the geosciences to the key concepts and principles of geology, geophysics, and petrophysics as applied to today's oil and gas industry with emphasis on business applications. This course is a condensed version of three popular NExT courses: Introduction to Geology, Introduction to Geophysics, and Introduction to Petrophysics. Many of the same topics are covered, but in less detail, and with more emphasis on the links between the three disciplines. This is an ideal introductory-level course to the geoscience disciplines.

COURSE CONTENT

- Geology and exploration
- Petroleum, depositional, and pore systems
- Structural features
- Geological mapping, correlation, and modeling
- Basic geophysics principles
- Marine and land seismic data acquisition
- Data processing
- Seismic interpretation and borehole seismic
- Basics of logging, logging tools, logging measurements, and log interpretation
- Reservoir parameters
- Coring and core analysis
- Basics of geomechanics

AUDIENCE

Oil and gas industry professionals wishing to understand the principles of the primary geoscience disciplines and their applications in today's E&P industry.

PREREQUISITE

None.

Introduction to Petrophysics - Including Traditional and Reservoir Petrophysics

Foundation – 5 Days

In this course covers fundamental petrophysical relations, with a primary focus on understanding water saturation, fluid contacts and free water level. Participants learn formation evaluation based on pore-geometry and petrophysical rock types.

COURSE CONTENT

Additional topics include fundamentals of core analysis, wireline log and open-hole interpretation. Applied work sessions (Excel) and participant presentations (PowerPoint) are key cornerstones that help participants gain confidence in using these methods. Several case studies are used to show the importance of integration between geology, geophysics petrophysics and reservoir engineering.

- An overview of how petrophysics fits into a reservoir characterization work flow
- Pre-course technical assessment
- Introduce the concept of using logs to identify reservoir fluids (oil, gas and water)
- Introduce a visual conceptual 3-Line log analysis technique
- Introduce Routine Core Analysis
- Porosity (total, effective includes both obvious and finer details
- Log based porosity (sonic, density, neutron and NMR Porosity)
- Core and log integration (porosity and lithology)
- Introduce the concept of petrophsyical rock types
- Introduce the ARchie Method and concept
- Determining petrophysical rock types using pore throat radius (Winland, Pittman and FZI approaches)
- Introduce high pressure mercury injection as a pore geometry evaluation tool
- Introduce how to determine the number of petrophsyical rock types needed in a field and well
- Introduce the height above free water concept
- Introduce the concept of flow units
- Introduce the concept of advanced flow units (determine the PRT, what units will produce water etc.)
- Workshops

AUDIENCE

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

PREREQUISITE

A technical degree and working knowledge of depositional systems and petroleum geology.

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

- 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.

Mastering Finance for Non-Financial Oil and Gas Personnel

Foundation – 2 Days

This course will instruct attendees who do not have a financial background in understanding the basic principles, theory, and practice of financial reporting and analysis as applied to the oil and gas industry. The course uses a combination of instruction, group discussions, and practical examples and exercises to ensure that the attendees absorb both the theory and the practical applications of the topics, which will include learning how to interpret, understand, and act on financial information, how to develop more effective decision-making skills, the elements of financial management specific to the oil and gas industry, and a conceptual understanding of key E&P accounting topics, including depreciation, reserves, decommissioning, and asset impairment tests.

COURSE CONTENT

- Sources, uses, data, and understanding of financial information
- Financial information systems and their uses in decision making
- Understanding basic financial principles
- Understanding the difference between cash flow and profit
- Oil and gas industry accounting policies
- Accounting for exploration and appraisal costs
- Understanding the nature and classification of reserves and the use of reserve data in E&P accounting
- Budget preparation and control
- Role of financial planning
- Preparing and controlling a budget

AUDIENCE

Managers, supervisors, specialists in all disciplines, and advisors who work with financial information and wish to develop a better understanding of finance and budgeting to become more effective in their jobs.

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 over view 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, desorption 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

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.

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
- Reservoir appraisal
- Simulated challenge 3: Exploration and appraisal drilling
- Field development
- Simulated challenge: Depletion plan
- 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.

Prospecting and Producing of Geothermal Energy

Foundation – 5 Days

This five-day course focuses on geothermal methods for analyzing conventional and unconventional geothermal systems, and developing geothermal reservoirs. The course is designed for exploration, production, and development geoscientists. Lectures show how geothermal analysis can reduce the risk associated with geothermal prospects, how to predict quality from inexpensive wellbore measurements, and ow to identify reservoir heat transfer in conductively and advectively dominated reservoirs. It provides interpretive guidelines for reservoir thermal signatures of various transient and steady-state heat transfer processes and teaches how to distinguish the overprint of steady-state conductive geotherms by various steady-state and transient processes. Participants learn how to derive thermophysical rock properties from geophysical conventional logs, and how field and lab techniques can be combined to estimate geothermal prospects.

COURSE CONTENT

- Thermal structure of the Earth
- Thermodynamic state functions (Gibbs equations, Maxwell relations)
- Energy budget of the Earth
- Heat transport by diffusion (steady state: conduction) and fluid-driven advection
- Thermal conductivity and diffusivity
- Specific heat capacity and thermal capacity
- Temperature and thermal conductivity
- Specific heat capacity
- Processing of geothermal data
- Technical perturbations
- Geothermal energy (shallow and deep borehole heat exchangers)?
- Natural steady-state and transient effects
- Definition of geothermal energ
- Types of geothermal resources
- Direct use of geothermal heat
- Geothermal energy (conversion into electric energy)
- Geothermal reservoir development
- Step-out exploration and field development

AUDIENCE

Anyone involved in geothermal projects.

PREREQUISITE

Basic knowledge of geology and geophysics.

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.

PREREQUISITE

Basic knowledge of exploration, development, and production operations.

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.

Petrel Fundamentals

Awareness – 3 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 a Petrel platform project setup to plotting results. The attendee will learn how to create surfaces and create a simple grid, in addition to how to quality control (QC) and visualize a simple grid using the geometrical modeling process, maps and intersections. The course also introduces Studio 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
- Surface editing and creation
- Grid building
- Geometrical modeling
- Data plotting
- Knowledge sharing and collaboration

AUDIENCE

Development and exploration geologists, geophysicists, geochemists, geoscientists, petroleum engineers, managers, and technical information technology (IT) personnel with no prior experience with the Petrel platform.

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 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 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.

OFM Analysis Dashboard

Awareness – 1 Days

This course introduces OFM Analysis dashboard as powerful data visualization tool helping you revel information to support better decision-making. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and shared results. You will learn to create highly efficient dashboards for production surveillance, project economics assessment, data mining, and data quality control. Delivered in 4-hours-workshop style, the course offers a fast-track option to keep your skills updated with OFM new features. OFM analysis dashboard is also offered as part of the 2-day OFM Fundamentals class.

COURSE CONTENT

- Introduction to OFM analysis dashboard

AUDIENCE

Anyone interested in gaining a general understanding of OFM Analysis Dashboard.

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.

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
- 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

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

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists, Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

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

- Set Merak Peep software preferences to customize views and calculation parameters
- 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

Petroleum Economics Fundamentals or equivalent knowledge, in addition to an understanding of basic decline analysis techniques and theory.

PIPESIM Fundamentals

Foundation – 2 Days

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
- Artificial lift design
- Model horizontal wells
- 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

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.

COURSE CONTENT

- Walk through 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 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.

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.

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 tasksthe 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.

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 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
- 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.

OFM Fundamentals

Foundation – 2 Days

The OilField Manager (OFM) Fundamentals course introduces new users to OFM functionality with emphasis on visualization, reporting, and data analysis. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and share results. This course covers basic usage of the application, providing an understanding of how to configure and personalize an OFM workspace, to use and create project variables.

COURSE CONTENT

- A brief walkthrough of a fully functioning project, providing 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
- Explore OFM analysis dashboard
- Create and format well and field summary reports
- Export reports and table data to other applications

AUDIENCE

Anyone interested in gaining a general understanding of OilField Manager (OFM).

PREREQUISITE

An interest in using OFM software.

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
- 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

AUDIENCE

Geoscientists, Geologists, Petroleum Engineers that need data delivered to their domain applications, and Data Managers, Technical IT personnel with data management delivery responsibilities.

PREREQUISITE

None.

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

Structural Geology and Tectonics	Carbonate Stratigraphy and Sedimentology	Clastic Stratigraphy and Sedimentology	COMPETENCY LEVEL
Petroleum Systems and Exploration and Development Geochemistry			ADVANCED
Applied Structural Geology in Hydrocarbon Systems Analysis		Techlog for Geologists	
Fault Seal Analysis in Exploration and Development: Theory and Application			
Fault Seal Analysis in Exploration and Development: Theory and Application - 3 DAY			
		Deepwater Sedimentary Systems: Exploration and Production	SKILL
		Sedimentology and Depositional Environments of Deepwater Deposits	
Petrel Fracture Modeling			
Petrel Structural Modeling			
	Concepts and Applications of Sequence Stratigraphy to Petroleum Exploration and Production		
	Sequence Stratigraphy: Principles and Applications		
	Carbonate Sequence Stratigraphy and Application to Petroleum Reservoirs	Clastic Sedimentology for Exploration and Development	
Structural Geology and Tectonics	Subsurface Facies Analysis - Integrating Borehole Images & Well Logs with Petrophysical and Seismic Data to Develop Geologic Models		
Integrated 3D Reservoir Modeling Workshop			
Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel			
Mapping the Subsurface with Petrel			
Fractured Reservoir Characterisation with Emphasis on Carbonates		Deepwater Reservoirs	FOUNDATION
Global Tectonics and Geological Prospecting Tools for Exploration			
	Carbonates in the Petroleum Industry	Geology of Clastic Reservoirs	
Fundamentals of Structural Geology	Introduction to Biostratigraphy		
		Fluvial and Shallow Marine Reservoirs	
Petrel Geology			
Introduction to Subsurface Mapping			
Petroleum Geology			
Introduction to Geology			
Introduction to Geoscience			

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

Geology

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	SOFTWARE	INTEGRATED/ BLENDED	FIELD TRIPS	VIRTUAL CLASSROOM

COMPETENCY LEVEL	Exploration: Play and Prospect Definition	Field Appraisal and Development
ADVANCED	Petroleum Systems and Exploration and Development Geochemistry	
	Evaluation and Management of Fractured Reservoirs	
	A Strategic Approach to Oil and Gas Exploration	Geostatistical Reservoir Modeling: Standard Approach and Best Practices
	Geological Assessment of Reservoir Seals and Pay	
SKILL	Deepwater Petroleum Systems - Fundamentals and Applications	
	Satellite Data Processing and Interpretation	
	Economics of Petroleum Exploration	
	Petrel Exploration Geology: Integrated Petroleum System-based Play-to-Prospect Exploration	Applied Geostatistics
	Petrel Petroleum System-based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows using Petrel Exploration Geology Software	Practical Applied Geostatistics with Petrel
	Applications of Borehole Imaging to Hydrocarbon Exploration & Production	
	Clastic Sedimentology for Exploration and Development	
	Subsurface Facies Analysis - Integrating Borehole Images & Well Logs with Petrophysical and Seismic Data to Develop Geologic Models	
	Integrated 3D Reservoir Modeling Workshop	
	Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel	
	Mapping the Subsurface with Petrel	
FOUNDATION		Development Geology
	Global Tectonics and Geological Prospecting Tools for Exploration	
	Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources	
	Prospect Evaluation, Risks, and Volumes	
	Basin Analysis and Petroleum Systems Modeling	
	GeoX Prospect Assessment Fundamentals	
	Operations and Wellsite Geology	
	Petrel Geology	
	Introduction to Subsurface Mapping	
	Petroleum Geology	
	Introduction to Geology	
	Introduction to Geoscience	

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

Petrel	PetroMod	COMPETENCY LEVEL
Petrel Advanced Property Modeling	PetroMod Quantification of Uncertainty Analyses in Petroleum Systems Modeling	ADVANCED
	PetroMod Advanced Topics	
Petrel Well Design	PetroMod Applied Petroleum Systems Modeling Workflows	SKILL
Petrel Exploration Geology: Integrated Petroleum System-based Play-to-Prospect Exploration		
Petrel Structural Modeling		
Petrel Fracture Modeling		
Petrel Property Modeling		
Petrel Introduction to Structural & Fault Analysis Module (RDR)		
Petrel Workflow Editor and Uncertainty Analysis		
Petrel Velocity Modeling		
Petrel Advanced Wells		
Petrel Shale Fundamentals	PetroMod Fundamentals	FOUNDATION
Studio for Petrel Users		
Petrel Geology		
Petrel Exploration Geology: Petroleum Systems Modeling Fundamentals		
Petrel Fundamentals		AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Techlog	GeoX
ADVANCED	Techlog Thin Bed Analysis using the LowReP method	GeoX Advanced Prospect Assessment
	Techlog Formation Evaluation with Quanti.Elan	
	Techlog Processing and Interpretation of Quanta Geo Images	
	Techlog Processing and Interpretation of Quanta Geo Images with Techlog Fundamentals	
	Techlog Borehole Image Processing and Interpretation	
	Techlog for Geologists	
SKILL	Techlog Formation Evaluation	GeoX Reserve Tracker
	Techlog Wellbore Integrity VILT	GeoX Full Cycle Value Assessment Concepts and Application
FOUNDATION	Studio for Techlog Users	GeoX Prospect Assessment Fundamentals
	Techlog Python	
AWARENESS	Techlog Fundamentals	

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

Structural Geology and Tectonics	Carbonate Stratigraphy and Sedimentology	Clastic Stratigraphy and Sedimentology	Exploration: Play and Prospect Definition	Field Appraisal and Development	COMPETENCY LEVEL
			Petrel Petroleum System-based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows using Petrel Exploration Geology Software	Practical Applied Geostatistics with Petrel	
Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel					
Mapping the Subsurface with Petrel					
Structural and Fault Analysis using Petrel -Integrated theory, outcrop and software - Northumberland, NE England		Fluvial and Deltaic Architecture and Advanced Modeling using Petrel - Utah / Colorado, USA	Trap and Seal Risking in Exploration and Development - A field and lecture workshop - Moab, Utah		SKILL
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		Characterisation and Petrel* 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky	From Field to Simulator - An Applied Basin and Petroleum Systems Modeling Workshop		
Trap and Seal in Exploration and Development: Integrated theory, outcrop and software - Petrel Structural and Fault Analysis module - Moab UT, USA					
Practical Fracture Analysis of Clastic Reservoirs with Petrel - Casper, Wyoming					

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Structural Geology and Tectonics	Carbonate Stratigraphy and Sedimentology	Clastic Stratigraphy and Sedimentology	Exploration: Play and Prospect Definition	Field Appraisal and Development
SKILL	Structural and Fault Analysis using Petrel -Integrated theory, outcrop and software - Northumberland, NE England	Syn-Rift Carbonate Platforms; Miocene-Recent Gulf of Suez			
	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		Delta-slope-turbidite deposition and synsedimentary deformation - County Clare, Ireland	From Field to Simulator - An Applied Basin and Petroleum Systems Modeling Workshop	Reservoir-scale heterogeneity in Upper Miocene Platforms of the Balearic Islands.
	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	
	Foreland Basin Syntectonic Sedimentation - Southern Pyrenees, Spain	Oligo-Miocene carbonate sedimentary models of Malta: analogues for Cenozoic reservoirs worldwide	Fluvial and Deltaic Architecture and Advanced Modeling using Petrel - Utah / Colorado, USA		
	Practical Fracture Analysis of Clastic Reservoirs with Petrel - Casper, Wyoming	Arid Coastline Carbonates and Evaporites of Abu Dhabi, UAE	Permian basin floor fan systems of Karoo, South Africa		
			Characterisation and Petrel* 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky		
FOUNDATION	Late Palaeozoic to Early Mesozoic Sedimentation, SW Province, UK				
	Introduction to Geology Including Pyrenees Field Trip				
	Introduction to Geology with OilSim and Pyrenees Field Trip				

Geology

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 | SOFTWARE | INTEGRATED/ BLENDED | FIELD TRIPS | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Structural Geology and Tectonics	Techlog
SKILL		Techlog Wellbore Integrity VILT
FOUNDATION	Structural Geology for Petroleum Applications	

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.

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.

Global Tectonics and Geological Prospecting Tools for Exploration

Foundation – 5 Days

A combination of lectures and hands-on practical exercises will introduce attendees to the fundamentals of an effective petroleum system. Emphasis is on global tectonics and how basins are formed, filled, and deformed as well as use of key geologic prospecting tools. Although the course focus is on clastic rocks, especially turbidites, it also reviews carbonate rocks and evaporite formations. The Atlantic Margin basin is the source for discussions of petroleum system elements. Attendees will be introduced to key aspects of source rock, migration, overburden rock, reservoir characteristics, seal rock, traps, timing, and preservation elements, in addition to learning the fundamental tools for exploration petrophysics.

COURSE CONTENT

- Five laws of geology
- Basin formation, plate tectonics, and source rocks
- Unconventional petroleum systems
- Evaporate and carbonate petroleum systems
- Fluvial, deltaic, and turbidite deposits
- Migration
- Basin filling and deformation
- Faulting as pathways and seals
- Structural traps

- Deformation, sutures and inclusions, rubble zones, and imaging below salt
- Petrophysics for exploration

AUDIENCE

Exploration geoscientists and managers who want a fundamental understanding of petroleum systems and key geologic prospecting techniques.

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
- 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

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 straitgraphy in clastic depositional systems
- Exercises

AUDIENCE

Geologists, geophysicists, reservoir engineers, reservoir simulation engineers.

PREREQUISITE

Basic knowledge of sedimentary 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

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

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.

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 understanding of 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.

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.

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. This course systematically introduces participants in a landwards to basinwards transect through all environments of deposition where reservoir quality sands are deposited.

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
- Geochemical Analysis for Petroleum Exploration
- 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

At least a basic knowledge of geology. No prior experience with Petroleum Systems Modeling is required.

GeoX Prospect Assessment Fundamentals)

Foundation – 5 Days

This three-days course is focused on providing attendees with an overview of the methods required for assessment of the risks and uncertainties within a contemporary prospect evaluation. Participants will learn the principles and concepts that should be applied when assessing both simple and complex prospects. Delivered in a workshop style, the course combines lectures on the principles of stochastic volume calculation, pre-assessment data collection and analysis; manual volume calculations exercises and exercises using the GeoX software suite to illustrate the analytical methods used to assess the risks and uncertainties of an exploration prospect. In the last session of the course the participants will use a case study to run their own GeoX prospect assessment.

COURSE CONTENT

- Concepts of single target (Segment) assessments
- Probabilistic Segment Analysis Setup
- Segment definition
- Segment volumetrics
- Volumetric uncertainty
- Segment volumetrics
- Volumetric uncertainty
- Parameter correlations
- Risk dependencies
- Risk dependencies
- Correlations between segments
- Fluid communication

AUDIENCE

Geologists, geophysicists, and reservoir engineers involved with prospect assessment.

PREREQUISITE

Participants should have a background in geosciences and preferably have some exposure to petroleum exploration and prospect evaluation concepts.

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
- Cuttings: Descriptions, abbreviations, lithologies, and log correlations

AUDIENCE

Geologists participating in well drilling or wellsite operations.

PREREQUISITE

Basic understanding of geology.

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
- 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 a general knowledge of petroleum geology and geophysics, as well as elemental software skills.

Introduction 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

Geologists, petroleum engineers and geophysicists involved with the development of oil and gas reservoirs.

PREREQUISITE

Basic Applied Petroleum Geology.

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
- 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

AUDIENCE

Geoscientists and petroleum engineers.

PREREQUISITE

Basic knowledge of geology.

Introduction to Geology

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
- Correlation and stratigraphy
- Principles of correlation (use of wireline logs, approaches, lithostratigraphy and chronostratigraphy, sequence stratigraphy, and seismic stratigraphy & biostratigraphy)
- Pore systems and diagenesis
- 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 dngineers, geoscientists, and other E&P staff with a need to understand the role geology plays in their everyday business activities.

PREREQUISITE

None.

Introduction to Geoscience

Foundation – 5 Days

The objective of this 5-day course is to introduce professionals from disciplines other than the Geosciences to the key concepts and principles of Geology, Geophysics, and Petrophysics as applied to the Oil & Gas industry today. Emphasis is placed on the business applications of the particular discipline, using case histories and examples/exercises as appropriate.

COURSE CONTENT

- Introduction
- Geology in General
- The Petroleum System
- Depositional Systems
- Structural Geology
- Pore Systems
- Geological Mapping and Correlation
- Geological Modeling
- Unconventional Resources
- Basic Principles
- Marine Seismic Acquisition
- Seismic Interpretation
- Life of Field Seismic
- Seismic Proof of Value
- Reservoir Parameters
- Coring and Core Analysis

AUDIENCE

Business professionals in the Oil & Gas Industry, who wish to understand the principles of the main Geoscience disciplines, and their applications in todays E&P industry.

PREREQUISITE

None.

Deepwater Sedimentary Systems: Exploration and Production

Skill – 3 Days

Sandstones deposited in deep marine environments form important hydrocarbon reservoirs in many basins around the world. Interbedded mudstones can be important as source rocks, as well as acting as barriers, baffles and seals. Deepwater reservoirs are currently the principal target for oil and gas exploration, with over 1600 existing turbidite fields and plays. Driven by technological advances and much improved scientific understanding, the pace of exploration and discovery in this realm is fast accelerating. Keeping pace with these developments and with the new knowledge base is essential for all those involved in deepwater systems. What began as the turbidite reservoir has matured into the more varies deepwater play of the 21st century that no company can afford to ignore.

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
- Satellite geomorphology : the correlation between topography and lithology
- Folds and fold belts
- Faults and fault systems
- Water courses and faults
- Deepwater massive sands
- Thin-bedded turbidites
- Deepwater drilling, seismic sequence stratigraphy, and deepwater plays review

AUDIENCE

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

PREREQUISITE

Basic petroleum geology, basic stratigraphy, and basic sedimentology.

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
- Deepwater Oil Transformations, Operational Geochemistry
- Applications
- Dry Hole Analysis, Case History III, Course review, Closeout and Evaluation.

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.

Satellite Data Processing and Interpretation

Skill – 5 Days

This course will provide participants with the knowledge and understanding of satellite data processing and interpretation in the hydrocarbon industry with applications to exploration, geophysical data acquisition and infrastructure planning. It will cover the theory behind satellite data acquisition, processing and archiving of optical and microwave satellite imagery as well as geological concepts for use with satellite imagery. The main focus of the course is on geological case studies and integration of satellite imagery data with other geosciences data culminating in satellite imagery-based exploration concepts. The participants will gain an understanding of what satellite imagery can and cannot deliver, what satellite imagery to use for what purpose and how to integrate it into the exploration, development and production workflows.

COURSE CONTENT

- Theoretical background
- Electromagnetic spectrum and wave propagation
- Impact of the atmosphere on satellite image data and corrections
- Imaging satellites : optical and microwave radar
- Geological concepts
- Deposition and erosion
- Faulting and folding
- Geomorphology : correlation of surface with subsurface llithology and tectonics
- Hydrology : the link of water bodies and flowing water to structure and lithology
- Geological mapping
- Mapping from satellite imagery
- Satellite data interpretation
- Satellite geomorphology : the correlation between topography and lithology
- Faults and fault systems
- Water courses and faults
- Integration with other geosciences
- Hydrocarbon mapping : onshore and offshore seepage mapping
- Ground subsidence from microwave radar : radar interferometry for surface subsidence and its link to subsurface production
- Prospect-scale geological joint interpretation of satellite imagery and shallow seismic data

AUDIENCE

Anyone who desires an increased understanding of satellite imagery and its use for the exploration, development and production of hydrocarbon fields.

PREREQUISITE

A background, degree or experience in the geosciences or engineering is preferred but not necessary.

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.

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.

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
- Building stochastic Fracture models

AUDIENCE

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

PREREQUISITE

Petrel Geology or equivalent Petrel experience. General good knowledge of Petroleum Geology.

Petrel Exploration Geology: Integrated Petroleum System-based Play-to-Prospect Exploration

Skill – 5 Days

This 3 to 5 days course teaches participants integrated exploration principles, workflows, and techniques using Petrel Exploration Geology software. The course focuses on developing participants' skill on play and prospect evaluation. The methods integrate all the petroleum system elements into geologically-based, objective and consistent workflows. These workflows document the results and the results can be easily updated once a new interpretation or data is available. Foremost, participants will understand why integrated petroleum system-based exploration is an industry best practice.

COURSE CONTENT

- Create 1D models for initial screening of concession area for prospectivity of the hydrocarbon charge and seal capacity
- Play Chance Mapping using Petrel play fairway maps, PSQL generation and charge maps, and PSQL seal capacity maps
- Update Play Chance Maps and volumetrics following newly available data. Re-evaluate chance of success for the lead/prospect segments
- Lead/Prospect volumetric assessment to assemble one segment or more

AUDIENCE

Exploration geoscientists who want to understand how play evaluation and petroleum systems principles and analysis are applied as the foundation to create chance of success maps, leads and prospects volumetric probabilities and to help make decisions.

PREREQUISITE

Good to have: Background knowledge on exploration, petroleum system modeling and Petrel basics.

Applied Geostatistics

Skill – 5 days

This course focuses on 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 engineers involved with exploration and development of oil and gas reservoirs.

PREREQUISITE

Basic knowledge of subsurface characterization with Microsoft Excel competency.

Petrel Structural Modeling

Skill – 3 Days

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.

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 Petroleum System-Based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows Using Petrel Exploration Geology Software

Skill – 5 Days

This 5-day course covers the fundamentals of petroleum systems and play concepts. These fundamentals will be integrated into a series of exercises that demonstrate 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.

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.
- 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.

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, multivariant 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, geophysists, 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 Clastic Sections - Book Cliffs, Utah : the first steps in the use of measured sections to build sequences stratigraphic models of clastic shoreline depositional systems, using measure sections from the Book Cliffs in Utah
- 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 - 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.

Sequence Stratigraphy: Principles and Applications

Skill – 5 Days

This course presents the concepts, illustrated with field examples of seismic, well logs, core, and outcrop data, and practical applications of sequence stratigraphy for petroleum exploration and production. 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 sequence stratigraphic analysis workflow.

COURSE CONTENT

- Introduction
- Historical development and fundamental concepts of sequence stratigraphy and other types of stratigraphy
- Sequence stratigraphic surfaces
- Systems tracts
- Applications to depositional systems

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

Basic knowledge of geology and geophysics.

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
- Paleocurrent 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.

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
- Porosity and permeability evolution in carbonate reservoir rocks, rock types, and classification of carbonate reservoirs.

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
- 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

Basic knowledge of geology and sedimentary processes.

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.

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
- 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
- Reservoir architecture
- Depositional models and facies analysis
- Core log integration
- Objects and indicators
- Seismic conditioning
- Facies modeling
- Property modeling in 3D
- Basic petrophysics
- 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.

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.

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

Knowlege 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
- Fault zones, flexural-slip folding, fracture processes
- Practical: fractured reservoirs interpretation, fault-seal predictions
- Role of basement and its relationship to the sedimentary cover
- Roles of deformation in the Hydrocarbon System
- Structural features on seismic: interpretation pitfalls, rules
- Practical: prospect interpretation exercises

AUDIENCE

Geoscientists working in Exploration or Production and reservoir engineers with a good geoscience understanding or an interest in learning how things work.

PREREQUISITE

Good knowledge of Geology, and understanding of the principles of Structural Geology. Some understanding of rock geomechanics.

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.

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
- Integrated final exercise
- Sealing fractures: prediction of location and orientation

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

Applied knowledge of reservoir geology and/or reservoir engineering is needed to gain the most from this class.

Fault Seal Analysis in Exploration and Development: Theory and Application

Advanced – 5 Days

he 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

- Introduction to fault seal and trap analysis
- Trap and fault geometry concepts and estimating closures and initial seal risk
- Methods and concepts on correctly characterizing faults and throw distributions. Theory and methods for evaluating correct fault linkages
- 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

Although no prerequisites are required for this course, the concepts are more suited to geoscientists with experience in mapping and evaluating exploration and development projects.

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 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.

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

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.

Fault Seal Analysis in Exploration and Development: Theory and Application - 3 DAY

Advanced – 3 Days

The objective of this course is to introduce concepts and methods in trap and seal analysis particularly as related to fault characterization including fault mapping and fault seal as applies to cross-fault flow resistance to geoscientists (geologists and geophysicists) and petroleum engineers so that they can apply these principals in their exploration and development projects. The lecture course introduces fundamentals and advanced concepts for faulting and flow for the prediction of fault behavior in subsurface traps. The concepts discussed in the lecture course are applied in simple exercises and related to the capabilities in the Petrel structural and fault analysis module to reinforce the technology.

COURSE CONTENT

- Introduction to fault seal and trap analysis
- Trap and fault geometry concepts and estimating closures and initial seal risk
- Review of fault rock types based on the undeformed host rock lithology
- Basic principles of flow through porous media including permeability and threshold pressure
- Introduction to fault mapping
- Review of methods for estimating the clay distribution across a fault surface including clay smear factor, shale gouge ratio and effective shale gouge ratio
- Triangle diagrams for estimating fault seal
- Risking and uncertainty
- Validation of methods and summary of course concepts
- Introduction to Structural and Fault Analysis Module

AUDIENCE

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

PREREQUISITE

None.

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. This popular course has been presented previously as AAPG, IPA and PESA Continuing Education Short Course as well as comprising part of the internal training program for several major oil and gas companies.

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.

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 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 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.

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
  - Input data and boundary conditions
  - Calibrating data using the Well Editor and calibrating models
  - Creating and editing lithologies
- 2D Workflow
  - Building a 2D model based on cross sections
  - Creating and editing horizons and faults
- 3D Workflow
  - Constructing 3D models from maps
  - Editing horizons and faults
  - Assigning properties and geologic ages, QC, and pitfalls

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.

Studio for Techlog Users

Foundation –2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists.

PREREQUISITE

Petrel fundamental.

GeoX Prospect Assessment Fundamentals

Foundation – 3 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
- Risk dependencies, Correlations between segments, Fluid communication, Understanding multi-compartment(Prospect) results, Case Study example

AUDIENCE

Geologists, geophysicists, and reservoir engineers involved with prospect assessment.

PREREQUISITE

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

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.

Techlog Python

Foundation – 2 Days

The Techlog Python class is designed to introduce users to programming basic and advance scripts in Techlog. How to create, edit, open and run scripts in Techlog (in a workflow). Basic python syntax and programming skills will be explained, few Python and Techlog modules (libraries) will be introduced. Advance scripting including reading/writing and creating Techlog modules will be covered.

COURSE CONTENT

- Introduction to Python
- History and concept
- Python inside Techlog
- Open and run scripts
- Understand the basics of programming
- Data QC and harmonization, file import, etc. (Techlog Database)
- Custom plots (Techlog Plot)
- Mathematical and scientific tools (Numpy / Scipy)
- Read/Write text, csv and excel files
- Import data from excel file and load it inside
- Techlog Database
- Reporting
- Create custom libraries

AUDIENCE

Software developers or geoscientists with basic programming skills interested in gaining a general understanding of programing in Techlog Python.

PREREQUISITE

Techlog fundamentals.

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.

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)
- The Petroleum Systems Concept
- 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
- Calibrate model using basic principles of temperature and maturity calibration
- Input data, create maps, and edit function curves
- Simulate different scenarios for generation, reservoir, seal and charge. Scenario-based risk assessment is taught with spatially varying input parameters
- 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, 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 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 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 Applied Petroleum Systems Modeling Workflows

Skill – 5 Days

The focus of this course is the application of common PetroMod* petroleum systems modeling tools, techniques and workflows. This workshop is a core component in the PetroMod Education Services offering. Students will spend the week working on a 3D dataset and upon successful completion of this course will be able to build Petroleum Systems models independently in area of simple to moderate geological complexity.

AUDIENCE

- PetroMod Project Data
- Input data analysis
- Output data analysis
- Customization of project data
- Faults and fracturing
- Temperature modelling theory
- McKenzie Crustal model
- HF Calibration tool
- Migration methods: Darcy, flowpath, IP, hybrid and combination
- Migration along faults
- Accumulation size, column height, PVT analysis
- API, GOR
- PetroMod overlays
- Petroleum systems events chart

AUDIENCE

Geophysicists and geoscientists involved in exploration projects (from basin to prospect scale), Geologists and geoscientists working on appraisal projects where hydrocarbon types and properties are not adequately understood, Petroleum Systems Modelers needing to integrate measured data with the model.

PREREQUISITE

PetroMod Fundamentals course, OG-SW1-SIS10780, or equivalent experience working with PetroMod software.

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.

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

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.

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.

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 Exploration Geology: Integrated Petroleum System-based Play-to-Prospect Exploration

Skill – 5 Days

The course focuses on developing participants' skill on play and prospect evaluation. The methods integrate all the petroleum system elements into geologically-based, objective and consistent workflows. These workflows document the results and the results can be easily updated once a new interpretation or data is available. Foremost, participants will understand why integrated petroleum system-based exploration is an industry best practice.

COURSE CONTENT

- Create 1D models for initial screening of concession area for prospectivity of the hydrocarbon charge and seal capacity
- Play Chance Mapping using Petrel play fairway maps, PSQL generation and charge maps, and PSQL seal capacity maps
- Update Play Chance Maps and volumetrics following newly available data. Re-evaluate chance of success for the lead/prospect segments
- Lead/Prospect volumetric assessment to assemble one segment or more

AUDIENCE

Exploration geoscientists who want to understand how play evaluation and petroleum systems principles and analysis are applied as the foundation to create chance of success maps.

PREREQUISITE

Background knowledge on exploration, petroleum system modeling and Petrel basics.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

GeoX Full-Cycle Value Assessment Concepts and Application

Skill – 3 Days

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. The course is built around a realistic case with a cluster of exploration opportunities. The introduction will cover the basic economics of exploring and exploiting a single target opportunity, and the concepts and application will then be expanded to multiple targets with staged, conditional exploration and exploitation activities that involve shared risk dependencies, shared facilities, and shared fiscals. To further elaborate on the concepts and their applications, the course also considers assessment of resource plays (shale oil/shale gas/CBM-unconventional) and incremental economics as well exploration portfolio assessment and optimization.

COURSE CONTENT

- Basics of full-cycle value assessment
- Full-cycle value assessment with GeoX software: single-target ventures
- Basics of risk and uncertainty
- Full-cycle value assessment with GeoX software: stochastic assessment of multiple target ventures
- More applications of full-cycle value assessment: resource plays, incremental economics
- Portfolio assessment and optimization

AUDIENCE

Geoscientists, engineers, commercial team members, or managers with a need to model and analyze the business impact of exploration ventures.

PREREQUISITE

Working knowledge of project economics previous experience with GeoX software is recommended.

Petrel Structural Modeling

Skill – 3 Days

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.

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

modeling in relation to how it is used in the Petrel platform and the oil industry in general. The course focuses on what data are required and how they can be used in the Petrel platform application. The attendees will study various Petrel platform processes and their use in viewing, checking quality, and manipulating the input fracture data. In the Petrel platform application, fracture modeling is split into two processes, generating a fracture network model and upscaling the fracture attributes to generate fracture porosity, permeability, and sigma factor. This course will increase the attendee's understanding of the fracture network model, which consists of a discrete fracture network and implicit fracture properties. We will use various geologic, structural, and seismic fracture drivers for fracture intensity description and ultimately combine them in using artificial neural networks. Discussion includes how output fracture properties can be used for simulation.

COURSE CONTENT

- Fracture theory
- Point well data and image log import and display
- Creating tadpoles and rose diagrams
- Stereonets, dip, azimuth; filters and fracture sets
- 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
- Upscaling fracture properties
- Use of multiple fracture drivers

AUDIENCE

Development and exploration geologists with prior experience in Petrel platform software.

PREREQUISITE

Petrel Fundamentals course and Petrel Geology course or similar experience in Petrel software, and general knowledge of petroleum geology and geophysics.

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 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 algortihms. 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
  - 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 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 omputations
  - 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 or similar Petrel experience, and general knowledge of structural geology, reservoir engineering, and geophysics.

Petrel Workflow Editor and Uncertainty Analysis

Skill – 2 Days

The 2-day course is designed to provide insight into the Workflow editor and the uncertainty and optimization process. The first day will focus on creating workflows for batch processing and operations and 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.

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

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 Velocity Modeling

Skill – 3 Days

The purpose of this course is to introduce the student to velocity modeling, velocity handling and domain conversion functionality in Petrel. It takes the user through the preparation stage of data used for velocity estimation and modeling. This

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.

COURSE CONTENT

- Quality control and editing of well data - checkshots, sonic logs, well tops
- Checkshot calibration of sonic logs
- Discussion of available velocity functions as well as different velocity modeling approaches
- Velocity modeling using well data – checkshots and sonic logs
- Velocity modeling using well tops
- Quality control and editing of velocity modeling results
- Depth error analysis and correction
- Creating user defined velocity functions
- Modeling of structural uncertainty

AUDIENCE

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

PREREQUISITE

Petrel Geophysics course or similar Petrel experience.

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 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.

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 Advanced Property Modeling

Advanced – 2 Days

This course focus on Facies modeling, which in recent years has become the main method for guiding and constraining Petrophysical models.Pixel based and Object models are demonstrated and exhausted 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, like the cutting edge Multi-point statistics process. Different ways of creating soft probability data using different processes to analyze data, such as trend modeling and geometrical trend modeling, exploring the relationship of secondary data to constrain models will also be 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.

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 resisitivity pay) module
- Perform a petrophysical summary on the thin bed results

AUDIENCE

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

PREREQUISITE

Techlog Fundamentals, Basic Petrophysics knowledge.

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

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 with Quanti.Elan

Advanced – 3 Days

This course introduces experienced log interpreters to building log interpretation models and generating solutions with the Quanti.Elan solver of Techlog. You will learn how to use the combiner to build a final model from several models and how to compute petrophysical results from the final model using the postprocessing method. This course also teaches you how to build one model per zone with Quanti. Elan solver of Techlog.

COURSE CONTENT

- Load and Quality Control data (from DLIS or LAS files)
- Pre-computations estimation of critical parameters for interpretations. These include mineral, rock and fluid endpoints and other petrophysical parameters.
- Log response equations with particular emphasis on neutron porosity and resistivity-based saturation equations
- Initialization
- Construction of Formation Evaluation models
- Zoning and Classification Groups
- Combining formation evaluation models
- Post Processing

AUDIENCE

Petrophysicists, Geologists, Log interpreters, and technical personnel with prior experience of formation evaluation with Techlog.

PREREQUISITE

Techlog Fundamentals and Techlog Formation Evaluation.

Techlog Processing and Interpretation of Quanta Geo Images

Advanced – 4 Days

This course 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

- QG Physics & Processing Overview
- QG Electromagnetics Fundamentals
- QG Physics
- QG Calibration
- QG Z90 Modes
- QG Corrected Amplitude & Blending
- QG Image Artifacts Catalog
- Interactive Depth Correction
- QG Utilities, Splicer, Drillmark Filter
- QG LQC & Deliverables
- QG Virtual Core & Virtual Slab
- QG Inversion Principles & Demo
- 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.

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
- QG Utilities, Splicer, Drillmark Filter
- Ex. 5 - Mode splicing & remedial
- QG LQC & 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

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 Processing and 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.

Petrel Petroleum System-Based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows Using Petrel Exploration Geology Software

Skill – 5 Days

This 5-day course covers the fundamentals of petroleum systems and play concepts. These fundamentals will be integrated into a series of exercises that demonstrate 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.
- 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.

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, multivariant 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.

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.

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
- Objects and indicators
- Seismic conditioning
- 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.

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
- 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
- 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
- WoodsideTrail 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
- Fault seal characterization and risk
- Drive to northern part of Moab Fault
- Faults in reservoir flow simulation
- 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

AUDIENCE

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.

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. At the conclusion of this course, the attendees will have a more comprehensive understanding of fault systematics in geometry and kinematics and the fault controls on sedimentation and how the systematics may be applied in improving subsurface interpretation. The course includes two field days based at Loutraki in the eastern Gulf of Corinth, and five days of combined lectures, classroom exercises and fieldwork based at Kalavrita in the Peloponnese.

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
- Pisia 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 hote.
- Dinner in town
- Morning Lectures
- 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
- 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

his 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
- 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
- Syn-rift faulting and role in hydrocarbon migration and trapping
- Fracture dynamics
- Recapitulation of field observations
- Upscaling exercise of logged source rock stratigraphy
- 1D petroleum systems modeling
- Calibration to field measurements
- 1D 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.

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
  - 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
- Late morning and afternoon: Field
- 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
- Late morning and afternoon: Field
- 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.

Field Trip: Late Palaeozoic Sedimentation, South Wales, UK

Foundation – 5 Days

The course starts at Aberystwyth but is based mainly at Tenby, where it will end. Both towns are served by the national rail network. A wide range of siliciclastic and carbonate depositional environments are examined, dating from early Silurian to late Carboniferous. Almost the entire length of the classic Llandoverian turbiditic Aberystwyth Grits depositional tract is examined. At Pembrokeshire outcrops, fluvial sediments range from Devonian Old Red sandstone flash flood and braided stream deposits to Silesian incised valley fills.

COURSE CONTENT

- Borth / Clydach /Aberystwyth / Aberaeron / New Quay: Submarine fan turbidites of the Llandoverian Aberystwyth Grit Group
- Stackpole: Dinantian Stackpole Limestone Formation; palaeokarst
- Ragwen Point: storm-dominated Namurian Twrch Sandstone disconformably overlying limestones of the Dinantian Oystermouth Formation
- West Amroth: Lower Westphalian Coal Measures containing the ankeritic Amroth Freshwater Limestone , Kilgetty Coal Seam, siderite concretions and liquefaction structures
- Wiseman's Bridge: multistorey channel stack with possible tidal influence
- Little Haven / Broad Haven: Westphalian A Coal measures with multistorey channels and anthracitic coals
- Nolton Haven: Upper Coal Measures Pennant Sandstone; low- and high-sinuosity streams with floodplain deposits and palaeosols

AUDIENCE

Geoscientists and petroleum engineers who wish to examine a wide variety of depositional environments.

PREREQUISITE

Basic understanding of Geology.

Introduction to Geology Including Pyrenees Field Trip

Foundation – 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

- Introduction
- Geology in General
- Structural Features
- Clastic Depositional Systems
- Carbonate Depositional Systems
- Geologic Mapping and Cross-Sections
- The Petroleum System
- Correlation and Stratigraphy
- Pore Systems and Diagenesis
- Field trip on the Trans-Pyrenean geological road
- Geological Modeling
- Seismic Methods and Petroleum Geology
- Basics of Wireline Logging and Interpretation

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 Field Trip

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
- Pore systems and diagenesis
- 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 dngineers, geoscientists, and other E&P staff with a need to understand the role geology plays in their everyday business activities.

PREREQUISITE

None.

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
- 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
- If time permits – drive to Seaton Sluice and view outcrops of reservoir channel sands
- QC of pillar faults and horizon input data
- Building horizons and layering
- QC of fault / horizon intersections
- Juxtaposition analysis
- Map-based volume calculation
- Incorporating geometric and stratigraphic uncertainty
- Drive to Hartley Steps car park to examine a series of low-throw faults around Hartley Steps.
- Discussion on scales of observation
- Outcrop-scale fault geometry and implications
- If time permits – drive to Collywell Bay to examine and discuss Collywell Bay fault
- Lecture – Fault rock property types, distributions and prediction methods. Fault seal theory and controls on flow.
- Exercise – Fault seal exploration workflow in Petrel
- Exercise – Fault seal production 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
- If not already visited, Seaton Sluice and/or Collywell Bay outcrops can be examined
- Lecture and exercise – Incorporating fault damage zones in the model (permeability modification)
- Using the workflow editor to model uncertainties
- Introduction to final exercise – Running uncertainty cases based on the Petrel model of the field area
- Final exercise – Teams run uncertainty cases and create powerpoint presentation summarizing their results
- Final presentations
- Coure 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.

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
- 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 interpretation 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 horizon interpretation and for the evaluation of cross-fault sealing as controlled by juxtaposition and other trap risks.

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
- Pisia 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
- 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
- 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
- Morning: 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

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 & 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
- Truklieve. Tullig progradation, flooding surfaces, minor parasequences, palaeovalley erosion and stacking; wave-influenced mouth-bars; marine bands
- Foohagh Point: Growth faulting in Doonlickey cyclothem
- 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 turbidites 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
- Syn-rift faulting and role in hydrocarbon migration and trapping
- Regional overview
- Recapitulation of field observations
- Upscaling exercise of logged source rock stratigraphy
- 1D petroleum systems modeling
- Calibration to field measurements
- 2D petroleum systems modeling workflow
- 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
- Lecture: Influence of basement physiography on carbonate factories.
- 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.

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
- 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

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

Skill – 5 Days

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.

COURSE CONTENT

- Introduction to the Paleocene to Pleistocene infill of the basin
- Evaluate mass flow processes and deposits in the basal succession
- View the transgressive systems tract on a seismic scale
- 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
- Contrast temperate and tropical carbonate factories and their accumulations

AUDIENCE

E&P geologists, geophysicists, and petroleum engineers who need a sound understanding of deep-marine and shallow sediments and their architectural elements.

PREREQUISITE

Good basic knowledge of geology.

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 excellent exposures of fault styles and fault zones in Utah are at a similar scale to subsurface traps. Structure maps on key horizons from the outcrop are used as analogues to subsurface traps and serve as a base for exercises throughout the week. The group is separated into teams who use the maps and synthetic well logs to produce "prospects" integrating the concepts learned during the week.

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
- Overviews to discuss regional geology
- Colorado National Monument: discussion of basement involved deformation
- Introduce team exercises and "prospect maps"
- 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
- Moab Fault and Anticline overview
- Review the structural styles and interpret the traps on structure maps on key horizons
- Discuss key risks, estimate column heights from spill, top seal capacity and fault juxtaposition seal using outcrop structure/prospect maps
- Evaluate the throws on fault and methods to evaluate
- Discuss the structural styles and fault linkages and walk up relay ramp to Delicate Arch
- Morning lecture: Fault seal characterization and risk
- Review of capillary process, permeability control and methods for estimating

flow resistance across faults

- 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
- Lecture (morning) and field (late morning)
- Morning Lecture: Faults in reservoir flow simulation
- 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

COURSE CONTENT

The course is designed for exploration and production geologists, geophysicists and engineers working in both extensional and structural terrains.

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 footwall 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-shed 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
- 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

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).

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 calcretes
- 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 calcretes
- 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 mimimum 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 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.

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 patch reefs; 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
- Origins of sabkhas
- Aeolian carbonate dunes and deflation
- Tidal channels and levees
- Anhydrite distributions
- Lateral zonation within microbial mats, hardgrounds, and teepee structures
- Miocene and Pleistocene zeugen and Miocene salina
- Microbial mats and evaporites
- Spit-lagoon complexes
- Beach rocks and coniatolites
- Compare Abu Dhabi ancient marine carbonate systems with other recent systems
- Compare modern giant barchans dunes with interdune sabkhas with similar Miocene outcrops at Shuweihat

AUDIENCE

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

PREREQUISITE

None.

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 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.

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.

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.

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 findamental understanding of the contributions and effects of structure.

PREREQUISITE

None.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss,

downhole equipment damage and expensive remedial work that could result from loss of well integrity. This course will teach you how to use Techlog* to evaluate Pipe and Cement integrity with wireline logging measurements.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

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.

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Geophysical Acquisition	Geophysical Data Processing	Structural and Stratigraphic Interpretation	Quantitative Seismic Interpretation
ADVANCED	Marine Seismic Acquisition Techniques and Survey Design	Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		
	Magnetotelluric and Controlled-Source Electromagnetic Methodologies for Geoscientists			
	Land Seismic Acquisition Techniques and Survey Design		Deepwater Seismic Interpretation	WinGLink for Analysis and Inversion of Magnetotelluric, EM, Gravity, and Magnetic Data
				Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements
SKILL	Microseismic Processing, Interpretation, and Applications			
	Borehole Seismic Acquisition, Processing and Operations		Practical Seismic Attributes with Petrel	
	Marine Seismic HSE Fundamentals	Practical Marine Seismic Time Processing with Omega	Practical AVO and Seismic Inversion with Petrel	
	Design of Marine 3D Seismic Surveys using OMNI 3D®	Practical Land Time Processing with Omega	Practical Seismic Interpretation with Petrel	Seismic Petrophysics and Rock Properties
		Introduction to Depth Imaging with Omega and Petrel	Seismic Structural Interpretation Techniques	Reservoir Geophysics
		Satellite Data Processing and Interpretation		
	Seismic Acquisition and Processing		Practical Depth Conversion with Petrel	
		Practical Depth Conversion and Depth Imaging for the Interpreter		
			A Modern Approach to Seismic Interpretation	
FOUNDATION		Fundamentals of Omega	Seismic Stratigraphy	AVO and Seismic inversion
			Petrel Geophysics	
			Seismic Processing for Interpreters and Others	
	Borehole Seismic Technology			
	Non-Seismic Geophysical Methods			
	Introduction to Geophysics: Acquisition, Processing and Interpretation			
	Introduction to Geophysics ; Acquisition, Processing and Interpretation with OilSim			

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

Petrel	Techlog	Omega / OMNI	COMPETENCY LEVEL
	Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		ADVANCED
Ray Tracing and Illumination with Petrel		WinGLink for Analysis and Inversion of Magnetotelluric, EM, Gravity and Magnetic Data	
Petrel Quantitative Interpretation			
	Techlog Acoustics Processing and Interpretation	Practical Land Seismic Processing with Omega	SKILL
Petrel Geophysics - Advanced		Practical Marine Seismic Time Processing with Omega	
		Introduction to Depth Imaging with Omega and Petrel	
		Design of Marine 3D Seismic Surveys using OMNI 3D®	
Petrel Seismic Well Tie		Introduction to VISTA® VSP Processing	
Petrel Workflow Editor and Uncertainty Analysis		Design of Land 3D Seismic Surveys with OMNI 3D®	
Petrel Velocity Modeling			
Petrel Geophysics	Studio for Techlog Users	Fundamentals of Omega	FOUNDATION
Studio for Petrel Users			
Petrel Shale Fundamentals			
Petrel Fundamentals			AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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.

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Geophysical Acquisition	Geophysical Data Processing	Structural and Stratigraphic Interpretation	Quantitative Seismic Interpretation
ADVANCED		Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		
	Magnetotelluric and Controlled-Source Electromagnetic Methodologies for Geoscientists			
SKILL		Practical Marine Time Processing with Omega	Practical Seismic Attributes with Petrel	
		Practical Land Time Processing with Omega	Practical AVO and Seismic Inversion with Petrel	
			Practical Seismic Interpretation with Petrel	Reservoir Geophysics
	Borehole Seismic Acquisition, Processing and Operations		Practical Depth Conversion with Petrel	
			A Modern Approach to Seismic Interpretation	

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.

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Structural and Stratigraphic Interpretation	Quantitative Seismic Interpretation
FOUNDATION	AVO and Seismic inversion	

Fundamentals of Omega

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 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 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
- 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.

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 oncovers 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
- 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.

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
- Improving spatial resolution
- Dip-moveout correction, offset continuation and MOVES
- Surface-related multiple elimination
- Statics solutions
- FX deconvolution
- Zero-offset reflection coefficients and reflection coefficients' amplitude dependence with offset

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 moden 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

AUDIENCE

Geologists and Geophysicists who need an understanding of the principles, uses, and applications of Borehole Seismic Data.

PREREQUISITE

Basic understanding of Geology and of the Geophysical method.

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: Acquisition, Processing and Interpretation

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
- The seismic experiment
- Reflection and refraction
- Seismic wavelet
- Multifold acquisition
- OilSim challenge 1: finding basins
- Marine Seismic Acquisition
- Simultaneous sources
- Hydrophones and streamers
- 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
- Wavelet shaping and Regularization
- Velocity modeling
- OilSim simulator challenge 2: prospecting
- Interpretation of geophysical data
- Synthetic seismograms
- Seismic stratigraphy
- Amplitudes and attributes
- Attributes, AVO and inversion
- OilSim simulator challenge 3: exploration drilling

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 Geophysics ; Acquisition, Processing and Interpretation with OilSim

Foundation – 5Days

The overall objective is to 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 as they affect the application of geophysical data and information in E&P workflows.

COURSE CONTENT

- Role of Geophysics in the E&P business
- What do we get from Geophysical Data?
- Overview of Geophysical techniques
- The business of Geophysics - Industry and competitive landscape
- Seismic Markets – Equipment, Acquisition, Multiclient
- Gravity and Aero-Gravity
- Magnetic and Aeromagnetic
- Electromagnetic – Controlled Source and Magneto-telluric
- Use and application of non-seismic technologies
- Marine sources – airguns. Bubble effect
- Simultaneous sources
- Seismic recording systems
- Hydrophones and streamers
- Streamer steering
- Use of multiple sources and receivers

- Multiple attenuation
- Migration – types and application
- Time and Depth Imaging
- Velocity Modeling
- Field technology – Acquisition Methods
- Check shots and VSPs
- Seismic while Drilling
- Trap definition
- Collaborative Interpretation – Seismic to Simulation
- Synthetic seismograms
- Structural mapping and contouring
- Seismic and Sequence Stratigraphy
- Evolution of the Seismic Business
- Seismic Service Companies – Seismos to WesternGeco

AUDIENCE

Entry level geoscientists, geologists, engineers and other E&P staff who need an overview of seismic / geophysics techniques and applications.

PREREQUISITE

Basic Knowledge of Subsurface Geology.

Microseismic Processing, Interpretation, and Applications

Skill – 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 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 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.

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.

Marine Seismic HSE Fundamentals

Skill – 5 Days

This 5-days course covers a full range of topics of safety, health and environment in marine seismic industry. It describes and presents HSE methodologies, processes, procedures and tools necessary to ensure and manage a safe working environment on-board a seismic research vessel. Participants will review the terminology used and reinforce the importance and relevance of most vital aspects of marine seismic HSE, which would continue to support them in their roles within the seismic industry.

COURSE CONTENT

- Introduction to Marine Seismic Industry
- Introduction and development of the HSE
- HSE Management Systems
- Local Legislation
- Offshore Operations
- Manual Handling & Ergonomics
- Hazard Identification & Risk Analysis
- Risk Management and Job Safety Analysis (JSA)
- Equipment Safety
- Operational Systems on board
- Safe Working Procedures & Permit to Work and Lock out Tag out (PTW & LOTO)
- Personal Protective Equipment
- Social Media & Community Relations
- Safety Leadership
- Auditing techniques
- Behavioural Based Safety
- Incident investigation & Root Cause Analysis
- Marine Life Protection

AUDIENCE

Anyone who is involved in the planning and execution of seismic surveys (including supervisors and managers) who needs an increased understanding of the management of HSE within the Marine Seismic environment.

PREREQUISITE

No mandatory prerequisites are required to complete this course although some knowledge of Marine or Seismic Industry knowledge would be advantageous.

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.

Design of Marine 3D Seismic Surveys using OMNI 3D®

Skill – 5 Days

This three or 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

- Brief introduction: interface and project tree description
- Project management
- NAZ (narrow azimuth towed streamer surveys)
- Fold plots: subsurface fold, unique fold, effective fold, cube of fold with depth
- Offset distribution plots
- Azimuth distribution plots
- P190 files
- Obstacles, editing source locations
- Undershooting
- Boundaries
- Plot tab: tools to create images for reports
- Reports
- Status files
- 2D ray tracing modeling
- 2D Wave equation modeling
- Target analyses: migration aperture, resolution, maximum offset, etc.
- 3D bin grid velocity models analyses
- 3D ray tracing model
- Illumination
- OBS (Ocean bottom cable and/or nodes) (optional, at client request)
- VSP (Vertical Seismic Profiles) (optional, at client request)
- 4D (Time-lapse)(optional, at client request)

AUDIENCE

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

PREREQUISITES

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

Practical Land Time Processing with Omega

Skill – 5 Days

This course will provide knowledge and understanding of how to use the Omega software processing package to process a land 3D seismic dataset 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 stacking velocity field.

COURSE CONTENT

- Land Data Reformat
- Data Sorting
- Basic Refraction Statics
- Surface Consistent Techniques
- Shot and Receiver Domain Noise Attenuation
- 3D Random Noise Attenuation
- Velocity Picking
- Interpolation and Smoothing
- Residual Statics
- Kirchhoff Pre-Stack time Migration
- Post Stack Processing
- Class Review

AUDIENCE

Those needing to know how to use Omega SPS to process land seismic data.

PREREQUISITE

An understanding of the concepts underlying seismic data processing and common data processing challenges. Participants without any prior knowledge of Omega must have taken the Fundamentals of Omega class before enrolling for this class.

Introduction to Depth Imaging with Omega and Petrel

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
- 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
- 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.

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).

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.

PREREQUISITE

General knowledge of both petrophysics and geophysics.

Seismic Structural Interpretation Techniques

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

AUDIENCE

All industry professionals, particularly geophysicists, geologists, petrophysicists, reservoir management professionals, and drilling engineers.

PREREQUISITE

Understanding of basic reservoir geology.

Reservoir Geophysics

Skill – 5 Days

The purpose of the course is to introduce geoscientists to the basics of rock physics and seismic acquisition as they are applied to reservoir geophysics. The course will cover the various seismic attributes, including amplitude variation with offset (AVO) attributes, that are used in reservoir geophysics and look at their application to time-lapse seismic. The course will also look at the application of seismic inversion in reservoir geophysics.

COURSE CONTENT

- Reservoir Geophysics: Quantitative Interpretation definition, phases, reservoir vs exploration geophysics, methodologies
- Rock physics: Density, Wave velocity, Poisson ratio, Physical properties of gases and fluids, Velocity in porous rocks, Fluid replacement modeling and saturation

effects, Rock property trend, Relationship between velocity & density, Vp-Vs transform, forward modeling.

- Fundamentals basis: Reflection of Seismic Wave, Polarity and Phase, Seismic Resolution, Tuning and wedge modelling
- Well-seismic tie & pitfall analysis
- Seismic sequence stratigraphy, sequences & system tract for reservoir characterization
- Direct Hydrocarbon Indicator (DHI) analysis
- Amplitude attribute
- Complex Attributes
- Similarity
- Curvature
- Spectral Decomposition
- Texture attributes
- RGB Blending
- Mathematical Foundation
- Prediction of AVO Response
- AVO Class 1, 2, 3 and 4
- AVO Gradient and Intercept
- AVO Attributes & Hodogram
- Definition, AI and Reservoir Characterization
- Convolution & deconvolution
- Bandlimited inversion
- Colored inversion
- Model-based inversion
- Sparse-spike inversion

AUDIENCE

Geoscientists (in particular, practicing Geophysicists) who need practical knowledge of the application of geophysical techniques at reservoir level.

PREREQUISITE

Familiarity with PETREL - minimum Petrel fundamentals., Reasonable knowledge of Geophysics. Basic understanding of Geology.

Satellite Data Processing and Interpretation

Skill – 5 Days

This course will provide participants with the knowledge and understanding of satellite data processing and interpretation in the hydrocarbon industry with applications to exploration, geophysical data acquisition and infrastructure planning. It will cover the theory behind satellite data acquisition, processing and archiving of optical and microwave satellite imagery as well as geological concepts for use with satellite imagery. The main focus of the course is on geological case studies and integration of satellite imagery data with other geosciences data culminating in satellite imagery-based exploration concepts.

COURSE CONTENT

- Theoretical background
- Electromagnetic spectrum and wave propagation
- Impact of the atmosphere on satellite image data and corrections
- Imaging satellites : optical and microwave radar
- Geological concepts
- Deposition and erosion
- Faulting and folding
- Geomorphology : correlation of surface with subsurface llithology and tectonics
- Mapping from satellite imagery
- Topographic mapping comprising surface gradient and the Sobel kernel and the geological interpretation of topographic information
- Surface spectral mapping for landuse comprising hydrological features, surface lithology, and structural geology
- Satellite data interpretation
- Embedding local prospect oriented satellite data interpretation into regional basin trends
- Satellite geomorphology : the correlation between topography and lithology
- Integration with other geosciences
- Seismic survey planning : access for crew, sources and receivers, data quality estimation and application to static correction and noise prediction
- Infrastructure planning : guides for pipeline and facility planning, geological and climatic risk analysis

AUDIENCE

Anyone who desires an increased understanding of satellite imagery and its use for the exploration, development and production of hydrocarbon fields.

PREREQUISITES

A background, degree or experience in the geosciences or engineering is preferred but not necessary.

Seismic Acquisition and Processing

Skill – 5 Days

The overall objective of this course is to introduce entry level and/or junior Geophysicists and Geoscientists to the essential acquisition and technical processing concepts and principles that form the basis for value added seismic applications in exploration, field appraisal, and reservoir management. Learning objectives are at foundation and knowledge levels.

COURSE CONTENT

- Introduction
- Basic Concepts of Seismic Surveying
- Seismic Wave Propagation
- Signal Analysis
- Seismic Reflection Principles
- Field Data Acquisition Principles
- Marine Acquisition Systems and Operations
- Land Acquisition Systems and Operations
- Near-Surface Distortion Correction
- Wavelets and Wavelet Shaping
- Regularization
- Noise Attenuation
- Multiple Attenuation
- Velocity Analysis for Time Processing
- Velocity Model Building
- Imaging
- Survey Design
- Recap and Review

AUDIENCE

Entry or Junior Level Geophysicists and more experienced staff who interpret seismic data and need exposure to acquisition and processing techniques.

PREREQUISITE

Basic understanding of Reservoir Geology and Geophysics.

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
- 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
- Conversion of velocity types
- Compactional and layered geologies
- 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)
- Explore depth conversion with layer-based methods
- Geologic and data-driven modeling considerations
- Understand accuracy of vertical time-to-depth methods and when they fail
- 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
- 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 Depth Conversion and Depth Imaging for the Interpreter

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.

COURSE CONTENT

- Sources and representation of velocities
- Velocity gradients
- Defining velocity as a function of depth and time
- Vertical time-to-depth conversion
- Single-layer and multilayer models
- Error analysis
- Advanced depth conversion
- Forming velocity models
- Quantitative well calibration
- Deepwater regimes
- Kirchhoff, depth, time, wave equation, and reverse-time migration
- Multicomponent and anisotropic considerations
- Tomographic velocity analysis: Layer based, grid based, and hybrid

- QC for iterative depth migration
- Initial velocity model
- Iterations and velocity resolution
- Focusing and structural response
- Gathers, vertical sections, and depth slices
- Corendering velocities and depth images
- Attributes and inversion
- Iterative calibration of depth migration with well control
- Isotropic and anisotropic parameter estimation and definition
- Optional interactive software work sessions

AUDIENCE

Seismic data interpreters, geophysicists, and geologists wanting a better understanding of velocity modeling, depth conversion, and depth migration.

PREREQUISITE

Basic knowledge of geophysics and seismic data interpretation.

A Modern Approach to Seismic Interpretation

Skill – 4 Days

The course offers practical guidance to interpreters on strategies for fault and horizon interpretation and the maturation of that interpretation network into robust structural frameworks. The techniques provided maximise the power of the 3D capabilities in Petrel and focus on workflow efficiency and dynamic visualisation of the data set. It also covers workstation and software optimisation, volume and surface attribute generation, volume rendering and integration of well data.

COURSE CONTENT

- Preamble
- Workstation Setup
- System & Project Setup
- A discussion on Aims and Output
- Horizon Interpretation
- Structural Modelling
- Structural Modelling
- Post Modelling – Surface Consolidation
- Horizon Based Analysis
- The 4 day course is aimed at geoscientists that are either new to Petrel or where seismic interpretation is not part of their daily workload.

AUDIENCE

Subsurface professionals that are new to Petrel (migrating from "interpretation window" focused software) or existing user looking for efficient 3D window-based workflows.

PREREQUISITE

Familiarity with some form of CAEX.

Marine Seismic Acquisition Techniques and Survey Design

Advanced – 5 Days

The course is designed to familiarize the student with the latest developments in conventional 3D Marine towed streamer seismic acquisition before moving on to cover the more recent developments in: 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 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

- Marine Seismic Acquisition
- Overview of course content and learning objectives
- Review of conventional marine seismic acquisition
- Wide-azimuth towed streamer seismic acquisition
- Marine Seismic Acquisition
- Broadband acquisition
- Time lapse acquisition
- Survey Design
- Objectives and methods in survey design
- Building and earth model
- Resolution and sampling
- Modeling, using a 1D earth model, to determine offset/angle limits, muting, bin size, fold and migration aperture
- Designing a 3D acquisition geometry

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 marine seismic acquisition operations.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 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).

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
- 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
- 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)
- 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)

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 petroelum engineering.

Magnetotelluric and Controlled-Source Electromagnetic Methodologies for Geoscientists

Advanced – 5 Days

The Magnetotelluric (MT) and Controlled-Source Electromagnetic (CSEM) methodologies course is meant to introduce a geoscientist to the physical concept of each electromagnetic measurements and to illustrate the added value of the integration of these methodologies for a better understanding of specific geologic targets in both marine and land environments. This course has also the objective to introduce the features of the Petrel Magnetotellurics and of the Petrel Controlled-Source EM plugins for the display, pre-conditioning, QC, modeling and interpretation of electromagnetics data.

COURSE CONTENT

- Basic concepts
- Modeling and interpretation
- MT survey: creation & actions
- Maps creation, display and editing
- Basic concepts (1D modes, hierarchy, actions)
- 1D Model creation, display and editing
- Model geometry building and property population
- 2D MT forward and inversion job setup and execution
- Model geometry building and property population
- 3D MT inversion setup
- CSEM survey: creation & actions
- CSEM window/QC tools
- Interactive data selection and cursor tracking
- Maps creation, display and editing
- Profile and profile window management
- Pseudo-section creation, display and editing
- Model geometry building and property population
- Model geometry building and property population

AUDIENCE

Geophysicists, Geologists and Geoscientists working with electromagnetic data (MT or CSEM).

PREREQUISITE

General knowledge of geophysics or geology, Petrel fundamental course or familiarity with Petrel interface and core functions.

Land Seismic Acquisition Techniques and Survey Design

Advanced – 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. In the second half of the course the students are taken through the principles of survey design. Learning is supported via hands-on practice where participants work together to design solutions to typical survey objectives and challenges.

COURSE CONTENT

- Overview of course content & learning objectives
- Introduction to land data acquisition & operations
- 2D and 3D acquisition geometries
- Simultaneous source, high-productivity vibroseis
- Broadband
- Arrays vs point receivers & sources
- 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
- Case study example: integrated study with SWAMI in Middle East
- Designing a 3D acquisition geometry
- Seismic sources
- Relation between geometry and imaging
- Case study example: single sensor broadband in Middle East
- AVO, pre-stack inversion and AVOAz
- Processing considerations: multiples, 4D
- New interpolation technology & non-uniform survey layout
- Case study example: inversion for unconventionals (US)

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.

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. The 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 seismology. 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

Geologists, 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

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.

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
- Patchy saturation
- 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.

Petrel Fundamentals

Awareness – 2 Days

his 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 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 oncovers 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.

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together. The course covers topics such as connecting to Studio, sending and retrieving data, receiving automatic notifications of updates, locking and unlocking data as well as more advanced workflows such as resolving data matches or conflicts.

COURSE CONTENT

- Overview and basic concepts

- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists.

PREREQUISITE

Techlog Fundamentals.

Fundamentals of Omega

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 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.

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 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
- 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 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

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

PREREQUISITE

Techlog Fundamentals.

Practical Land Time Processing with Omega

Skill – 5 Days

This course will provide knowledge and understanding of how to use the Omega software processing package to process a land 3D seismic dataset 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 stacking velocity field.

COURSE CONTENT

- Land Data Reformat
- Geometry database creation
- Basic refraction Statics
- Surface Consistent Techniques
- Shot and receiver domain noise attenuation
- 3D Random noise attenuation
- Velocity Picking
- Interpolation and Smoothing
- Kirchhoff Pre-Stack Time Migration
- Final Stack
- Filtering and Scaling

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/CMY - 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/CMY - 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
- 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

Development and exploration geophysicists, geologists, reservoir engineers and asset team members with prior experience in Petrel.

PREREQUISITE

Petrel Geophysics or Petrel Geophysics – Seismic Visualization and Interpretation, General knowledge of Exploration and Development geophysics, intermediate interpretation and software skills required.

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.
- Regularization
- 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.

Introduction to Depth Imaging with Omega and Petrel

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
- 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.

Design of Land 3D Seismic Surveys with OMNI 3D®

Skill –3 Days

This three-day hands-on training course provides students with the foundations needed to use OMNI 3D® in a full range of quality control and design tasks for land seismic acquisition planning from field QC to advanced design analyses. This course teaches 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

- Introduction: the land survey design workflow
- OMNI 3D® interface and project tree description
- Project management
- Orthogonal surveys
- Fold plots: Subsurface fold, unique fold, effective fold, cube of fold with depth.
- Offset distribution plots
- Azimuth distribution plots
- Skewed surveys
- Staggered surveys
- Brick surveys
- SPS files
- Obstacles, editing source and receiver stations
- Boundaries
- Plot tab: tools to create images for reports
- Reports
- Status files
- Target analyses: Migration aperture, resolution, Maximum Offset, Amplitude Attenuation etc.
- 3D Bin Grid Velocity Models analyses
- 3D ray tracing model
- 3D synthetic datasets
- Illumination

AUDIENCE

This class is suitable for geophysicists and geologists wanting to learn how to plan and design land 3D 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.

Introduction to VISTA® VSP Processing

Skill – 3 Days

This three-day training class will introduce the student to VISTA VSP V2014. It provides an overview of VISTA's tools for project management, data import and

manipulation, and VSP processing flow construction. By the end of the class, students will be able to prepare VSP data for processing, pick interval velocities, separate down-going and up-going wavefields, deconvolve and create corridor stacks, compute Q attenuation, create VSPCDP sections, estimate anisotropy and AVO parameters and migrate the data.

COURSE CONTENT

- Create and manage projects, project settings and defaults, import datasets in SEGY and SEGD formats
- VISTA dictionaries - creation and editing
- Sorting
- VSP geometry set up
- Amplitude recovery testing and application (Tpower, ExpGain) and amplitude equalization
- Signal analysis (FK filter design, frequency analysis, S/N ratios, etc.)
- Working with the Header and Attribute Windows (crossplot displays, header math, header mapping and trace statistics)
- Q attenuation estimation
- 3C trace rotations
- VSPCDP section (OVSP)
- Walkaway VSP processing workflow
- VSP migration

AUDIENCE

This class is suitable for geophysicists and geologists wanting to learn how to process Zero offset (ZVSP), Offset VSP (OVSP) and walkaway (WVSP) seismic surveys with the VISTA software package.

PREREQUISITE

A basic understanding of VSP seismic processing concepts. No prior experience with VISTA is required.

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.

Design of Land 3D Seismic Surveys with OMNI 3D®

Skill –5 Days

This three-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 land seismic acquisition planning from field QC to advanced design analyses. This course teaches 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

- Explain parallel, orthogonal, areal and random acquisition geometries
- Explain the essential acquisition parameters and how to select them
- Demonstrate the different elements of the OMNI 3D® interface
- OMNI 3D® interface and project tree description
- Project management
- Fold plots: Subsurface fold, unique fold, effective fold, Cube of fold with depth.
- Azimuth distribution plots
- Import and export surveys in SPS format
- Edit surveys in OMNI 3D, move, toggle, insert and delete stations
- Layout a survey inside a given boundary
- Efficiently create images and reports
- Use the Status tool to automatically update plots with new acquired data
- Obstacles, editing source and receiver stations
- Plot tab: tools to create images for reports
- Create a 3D Earth Model in OMNI 3D®
- Use a 3D Earth model to perform target analysis and create 3D synthetics using ray tracing
- Perform illumination of a target
- 3D Bin Grid Velocity Models analyses

AUDIENCE

This class is suitable for geophysicists and geologists wanting to learn how to plan and design land 3D 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 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.

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
- Modeling of structural uncertainty

AUDIENCE

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

PREREQUISITE

Petrel Geophysics course or equivalent Petrel experience.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 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).

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
- 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
- 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)
- 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)

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 petroelum engineering.

Ray Tracing and Illumination with Petrel

Advanced – 3 Days

This three-day hands-on training class provides students with the foundations needed to use the Petrel RTI tools in a full range of acquisition quality control, survey design, and imaging tasks. This course teaches how to create surveys for the different acquisition configurations, how to trace rays using different methods, create synthetic data, illuminate targets, and apply the results in seismic survey design, processing and imaging workflows.

COURSE CONTENT

- Geometry layout and ray tracing methods
- Navigate the Petrel RTI interface
- Explain the different ray tracing methods implemented in Petrel RTI
- Introduction: Petrel RTI interface and project tree description
- Project management
- Create acquisition geometries using RTI plugin
- Ray tracing methods and applications
- Create rose plots
- Create synthetic datasets
- QC an earth model using checkshot ray shooting
- Display the ray spreadsheet and export ray data
- Generate synthetic datasets
- Create illumination maps
- Use ray tracing results to estimate survey design parameters
- Target horizon illumination
- Illumination analysis attributes
- Create an illumination analysis

AUDIENCE

This class is suitable for geophysicists and geologists wanting to learn how to integrate the Petrel RTI tools into acquisition QC, survey design, and imaging workflows.

PREREQUISITE

A knowledge and understanding of seismic theory, seismic & well data usage and limits, and basic ray tracing concepts. The student should be familiar with the key

concepts of seismic survey design, acquisition, and processing. Familiarity with basic Petrel functionality is essential and knowledge of the Seismic Velocity Model (SVM) Petrel plugin is recommended.

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
- Fitting of AVO approximations to seismic data
- AVO reconnaissance AVO reconnaissance tool
- Simultaneous seismic inversion and the Inversion property builder What is seismic inversion?
- 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?
- 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.

Practical Marine 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 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
- Geological scenarios and the applications of attributes
- Stratigraphic applications
- Channels and fluvial systems
- Geological scenarios and the applications of attributes
- Formation orientation
- Lithology indicators
- Structural attributes
- Fracture indicators
- Carbonates and Salt
- Direct hydrocarbon indicators
- Create seismic attributes using the seismic calculator
- Seismic attribute workflows and best practices
- Thoughts for the future

AUDIENCE

Geoscientists interpreting seismic data volumes.

PREREQUISITE

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

Practical Land Time Processing with Omega

Skill – 5 Days

This course will provide knowledge and understanding of how to use the Omega software processing package to process a land 3D seismic dataset 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 stacking velocity field.

COURSE CONTENT

- Land Data Reformat
- Geometry database creation
- Basic refraction Statics
- Surface Consistent Techniques
- Shot and receiver domain noise attenuation
- 3D Random noise attenuation
- Velocity Picking
- Interpolation and Smoothing
- Kirchhoff Pre-Stack Time Migration
- Final Stack
- Filtering and Scaling

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

Skill – 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.

COURSE CONTENT

- Introduction to seismic reservoir characterization
- Software and quantitative interpretation techniques
- AVO theory, inversion, modeling, QC, and preconditioning
- 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
- 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
- Characterization

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.

Reservoir Geophysics

Skill – 5 Days

The purpose of the course is to introduce geoscientists to the basics of rock physics and seismic acquisition as they are applied to reservoir geophysics. The course will cover the various seismic attributes, including amplitude variation with offset (AVO) attributes, that are used in reservoir geophysics and look at their application to time-lapse seismic. The course will also look at the application of seismic inversion in reservoir geophysics.

COURSE CONTENT

- Reservoir Geophysics: Quantitative Interpretation definition, phases, reservoir vs exploration geophysics, methodologies
- Rock physics: Density, Wave velocity, Poisson ratio, Physical properties of gases and fluids, Velocity in porous rocks, Fluid replacement modeling and saturation effects, Rock property trend, Relationship between velocity & density, Vp-Vs transform, forward modeling.
- Fundamentals basis: Reflection of Seismic Wave, Polarity and Phase, Seismic Resolution, Tuning and wedge modelling
- Well-seismic tie & pitfall analysis
- Seismic sequence stratigraphy, sequences & system tract for reservoir characterization
- Amplitude attribute
- Complex Attributes
- Geostatistical Multi-attributes.
- Mathematical Foundation
- Prediction of AVO Response
- AVO Class 1, 2, 3 and 4
- AVO Gradient and Intercept
- AVO Cross-Plot
- AVO Attributes & Hodogram
- Definition, AI and Reservoir Characterization
- Convolution & deconvolution
- Bandlimited inversion
- Colored inversion
- Model-based inversion
- Sparse-spike inversion

AUDIENCE

Geoscientists (in particular, practicing Geophysicists) who need practical knowledge of the application of geophysical techniques at reservoir level.

PREREQUISITE

Familiarity with PETREL - minimum Petrel fundamentals. Reasonable knowledge of Geophysics. Basic understanding of Geology.

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.

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
- Indicators for prestack depth migration (PSDM)

- Discussions on student goals and experiences with time-to-depth conversion
- Review common sources of velocity information
- Sonic logs, check shots, and VSPs
- Compactional and layered geologies
- Velocity as a function of time
- Implicit velocity representation via T-D functions
- Petrel Velocity Models with time and depth functions
- Various problems defining velocity fields in various domains
- Pitfalls of Vertical Depth Conversion
- Understand accuracy of vertical time-to-depth methods and when they fail
- 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
- 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
- Problems and promise of anisotropy for velocity definition and seismic attributes
- Discuss impact of anisotropy on depth conversion and imaging
- Learn basic approach for stable integration of depth-domain seismic (PSDM) 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.

A Modern Approach to Seismic Interpretation

Skill – 4 Days

The course offers practical guidance to interpreters on strategies for fault and horizon interpretation and the maturation of that interpretation network into robust structural frameworks. The techniques provided maximise the power of the 3D capabilities in Petrel and focus on workflow efficiency and dynamic visualisation of the data set. It also covers workstation and software optimisation, volume and surface attribute generation, volume rendering and integration of well data.

COURSE CONTENT

- Preamble
- Workstation Setup
- System & Project Setup
- Data Preparation
- A discussion on Aims and Output
- Fault Interpretation
- Horizon Interpretation
- Structural Modelling
- Structural Modelling
- Post Modelling – Surface Consolidation
- Horizon Based Analysis
- 2D in 3D
- The 4 day course is aimed at geoscientists that are either new to Petrel or where seismic interpretation is not part of their daily workload.

AUDIENCE

Subsurface professionals that are new to Petrel (migrating from "interpretation window" focused software) or existing user looking for efficient 3D window-based workflows.

PREREQUISITE

Familiarity with some form of CAEX.

Magnetotelluric and Controlled-Source Electromagnetic Methodologies for Geoscientists

Advanced – 5 Days

The Magnetotelluric (MT) and Controlled-Source Electromagnetic (CSEM) methodologies course is meant to introduce a geoscientist to the physical concept of each electromagnetic measurements and to illustrate the added value of the integration of these methodologies for a better understanding of specific geologic targets in both marine and land environments. This course has also the objective to introduce the features of the Petrel Magnetotellurics and of the Petrel Controlled-Source EM plugins for the display, pre-conditioning, QC, modeling and interpretation of electromagnetics data.

COURSE CONTENT

- Theory Magnetotellurics
- Plug-in training MT core
- Data navigator, viewing and legends
- Interactive data selection and cursor tracking
- Conversion to wells and well log reduction
- Model geometry building and property population
- 2D MT forward and inversion job setup and execution
- Model geometry building and property population
- Plug-in training CSEM core
- CSEM survey: creation & actions
- CSEM window/QC tools
- Data navigator, viewing and legends
- Maps creation, display and editing
- Pseudo-section creation, display and editing
- Basic concepts (1D modes, hierarchy, actions)
- 1D Model creation, display and editing
- Model geometry building and property population
- 2D CSEM forward setup and execution

AUDIENCE

Geophysicists, Geologists and Geoscientists working with electromagnetic data.

PREREQUISITE

General knowledge of geophysics or geology, Petrel fundamental course or familiarity with Petrel interface and core functions.

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 maint products such as slowness projections and slownesses.

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
- Understand the different acoustic data types (raw and filtered waveforms, slowness projections, etc).
- Non-dispersive slowness time coherence (STC) processing workflow
- The importance of dispersion analysis for identifying best processing parameters
- Dispersive STC (DSTC) for dipole data
- High-resolution (multiple shot) processing
- Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
- Processing slownesses in challenging environment: Leaky-P processing
- 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)
- Understanding the shale anisotropy and how to characterize it using sonic data
- How to use acoustic outputs in the geomechanical workflows (mechanical earth model building, minimum and maximum horizontal stress estimation and fracture characterization)

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 petroelum engineering.

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.

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.

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 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	SOFTWARE	INTEGRATED/BLENDED	VIRTUAL CLASSROOM

COMPETENCY LEVEL	Petrophysical Property Mapping	Open Hole Log Interpretation	Production Logging and Reservoir Monitoring
ADVANCED	Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		
	Applied Capillary Pressure and Saturation Height Modeling	Advanced Formation Evaluation in Carbonates	Advanced Production Logging
	Applied Reservoir Petrophysics and Characterization (APRC) - Customized for Clients	Advanced Formation Evaluation in Sandstones	Well Integrity - Cased Hole Logging and Monitoring
	Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements	Advanced Formation Evaluation in Carbonates, Clastics and Basement Rock	Advanced Reservoir Monitoring
			Applied Production Logging and Reservoir Monitoring
SKILL	Advanced Integrated Reservoir Analysis		Intermediate Production Logging and Reservoir Monitoring
		Openhole and Cased Hole Data Acquisition and Interpretation	
	Advanced Core and Log Interpretation	MWD and LWD Tool Physics and Applications	
		Applied Formation Evaluation and Basic Log Analysis Using Techlog (Quanti)	
	Applied Core Analysis - How to Interpret Core Data	Tool Physics - High Technology Imaging and Logging Tools	
	Integrated Reservoir Modeling: Interpretation, Evaluation, and Optimization with Petrel	Advanced Carbonate Petrophysics From Pores to Logs	
	Integrated Wellbore and Reservoir Analysis: From Pore to Well Test Scale	Basic Logging Methods and Formation Evaluation	
FOUNDATION	Integrated Reservoir Analysis		Basic Reservoir Monitoring
	Statistics and Petrophysics		Basic Production Logging
	Fundamentals of Geology and Basic Core Analysis	Practical Wireline Logging for Geoscientists	Cased Hole Logging and Formation Evaluation
		Tool Physics- Standard Logging Tools	
		Well Placement Fundamentals	
		Petrophysics for Drilling Engineers	
	Coring, Wellsite Handling and Conventional Core Analysis		
	Introduction to Petrophysics - Including Traditional and Reservoir Petrophysics		Introduction to Production Logging and Reservoir Monitoring

Petrophysics

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 | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

Techlog	Petrel	COMPETENCY LEVEL
3D Petrophysics for High Angle Well Evaluation		ADVANCED
Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		
Techlog for Unconventional Shales Evaluation		
Techlog Thin Bed Analysis using the LowReP method		
Techlog Processing and Interpretation of Quanta Geo Images		
Techlog Processing and Interpretation of Quanta Geo Images with Techlog Fundamentals		
Techlog Reservoir Petrophysics		
Techlog for Geologists		
Techlog Borehole Image Processing and Interpretation		
Techlog Formation Evaluation with Quanti.Elan		
Techlog Saturation Height Modelling	Petrel Advanced Wells	SKILL
Techlog Formation Evaluation	Petrel Property Modeling	
Techlog Acoustics Processing and Interpretation		
Techlog Formation Pressure Analysis		
Techlog Wellbore Integrity Evaluation		
Techlog Cased Hole formation evaluation		
Techlog Wellbore Integrity VILT		
Techlog Python		FOUNDATION
Studio for Techlog Users		
Techlog Fundamentals		AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

Petrophysics

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	SOFTWARE	INTEGRATED/BLENDED	VIRTUAL CLASSROOM

COMPETENCY LEVEL		
	Petrophysical Property Mapping	Open Hole Log Interpretation
SKILL	Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics	
FOUNDATION		Applied Formation Evaluation and Basic Log Analysis Using Techlog (Quanti)

Petrophysics

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	SOFTWARE	INTEGRATED/BLENDED	VIRTUAL CLASSROOM

COMPETENCY LEVEL			
	Petrophysical Property Mapping	Production Logging and Reservoir Monitoring	Techlog
SKILL			Techlog Wellbore Integrity VILT
FOUNDATION	Capillary Pressure and Saturation Height Model Concepts For Reservoir Petrophysics	Introduction to Cased-Hole Data Acquisition and Interpretation	

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
- Justification for production logs
- Pulsed neutron capture cross section mode and carbon/oxygen mode
- Acquisition of formation resistivity in cased hole
- Slimhole induction logging in plastic (nonconductive) casing
- Workshop: Using capture mode for evaluating water and gas saturation
- Workshop: Interpreting behind-casing resistivity logs

AUDIENCE

Geoscientists or engineers responsible for field-wide surveillance or reservoir monitoring programs.

PREREQUISITE

Engineering or geosciences degree.

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.

Basic Production Logging

Foundation – 5 Days

This course teaches you the use and limitations of a variety of production logging tools including spinner, temperature, noise, fluid injections and others tools. You will learn what results these tools yield, the interpretation assumptions that are integral to their designs, and how quality is affected by the acquisition process. You will also learn the fundamentals of production log interpretation with hands-on examples and an in-class workshop on interpreting single and two phase flow using production logs. You will learn how production logs can be used for the measurement of 3 phase fluid 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
- 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 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
- 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 exposure 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.

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
- Overview of water saturation (Sw) evaluations in shaly sands.
- Workshop on Parameter Evaluations using the Archie Equation, and Shaly Sand equations.

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

- 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.

Cased Hole Logging and Formation Evaluation

Foundation – 5 Days

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.

Tool Physics: Standard Logging Tools

Foundation – 5 Days

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 hotoelectric 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 determing porosity, lithology, shale volume, hydrocarbon trends, and shale distribution (dispersed or laminated); (6) resistivity tool physics of the shallow Rxo, 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 mobilities, reservoir pressure, and fluid contacts in the reservoir.

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.

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
- 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.

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

AUDIENCE

Drilling engineers, directional drillers, and other geoscientists associated with drilling.

PREREQUISITE

None.

Coring, Wellsite Handling and Conventional Core Analysis

Foundation – 5 Days

This course will give participants a complete overview of the coring process, including core techniques and wellsite handling. Designing a core program, conventional core analysis and an introduction to capillary pressure and saturation height modeling.

COURSE CONTENT

- Introduction, set course objectives and class participants complete a techncial course assessment
- Why core data is important
- Coring process and options
- Core equipment
- Designing a coring program
- Wellsite core handling
- Core sample preparation
- Core visualization CT-Scan, Core Gamma Ray and Slabbing
- Core cleaning (removing drilling fluids, hydrocarbons, water and salt)
- Core drying methods
- Wettability concerns
- Porosity and Why it is important
- Bulk volume - measurement options
- Pore volume - measurement options
- Grain volume - measurement options
- Total porosity - why it is important
- Effective porosity - why it is important
- Determining fluid saturation in conventional core analysis
- Introduction to special core analysis (SCAL)
- What is capillary pressure
- Defining pore throat radius, free-water level and fluid contacts
- Capillary Pressure workshop
- Introduction core-log integration (Lithology, Porosity, Permability and Fluid Saturation)
- Introduction to 3-Line log quicklook method
- Well Log workshop
- Introduction to Saturation Height Model (Excel)
- Saturation Height Model (Excel) workshop

AUDIENCE

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

PREREQUISITE

A technical degree and working knowledge of depositional systems and petroleum geology.

Introduction to Petrophysics - Including Traditional and Reservoir Petrophysics

Foundation – 5 Days

Introduction to Petrophysics covers fundamental petrophysical relations, with a primary focus on understanding water saturation, fluid contacts and free water level. Participants learn formation evaluation based on pore-geometry and petrophysical rock types. Additional topics include fundamentals of core analysis, wireline log and open-hole interpretation. Applied work sessions (Excel) and participant presentations (PowerPoint) are key cornerstones that help participants gain confidence in using these methods. Several case studies are used to show the importance of integration between geology, geophysics petrophysics and reservoir engineering.

COURSE CONTENT

- An overview of how petrophysics fits into a reservoir characterization work flow
- Pre-course technical assessment
- Petrophysical properties and how they relate to static and dynamic models are discussed to show the importance of cross discipline integration (reservoir fluid properties, drive mechanism, volumetrics and recovery factors)
- Introduce Routine Core Analysis
- Porosity (total, effective includes both obvious and finer details
- Log based porosity (sonic, density, neutron and NMR Porosity)
- Core and log integration (porosity and lithology)

- Introduce the concept of petrophsyical rock types
- Determining petrophysical rock types using pore throat radius (Winland, Pittman and FZI approaches)
- Workshop - Winland petrophysical rock types
- Introduce high pressure mercury injection as a pore geometry evaluation tool
- Introduce how to determine the number of petrophsyical rock types needed in a field and well
- Workshop - determine the number of petrophsyical rock type
- Workshop - discuss the various ways to average petrophsyical data
- Introduce the height above free water concept
- Introduce the concept of flow units
- Workshop - using basic flow units
- Introduce the concept of advanced flow units (determine the PRT, what units will produce water etc.)
- Workshop - Well evaluation using advanced flow units

AUDIENCE

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

PREREQUISITE

None.

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.

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

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 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.

Openhole and Cased Hole Data Acquisition and Interpretation

Skill – 5 Days

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 quicklook techniques, 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.

Advanced Core and Log Interpretation

Skill – 6 Days

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)
- 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

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

MWD and LWD Tool Physics and Applications

Skill – 5 Days

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. The new-technology sourceless neutron and density data acquisition, LWD acoustic measurements, LWD seismic measurements, LWD formation pressure, and formation mobility 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

This is an opportunity for technical personnel in all fields, irrespective of their experience to have a full and wide exposure to the various new technologies of MWD and LWD.

PREREQUISITE

None.

Applied Formation Evaluation and Basic Log Analysis Using Techlog (Quanti)

Skill – 5 Days

Applied Formation Evaluation and Basic Log Analysis Using Techlog - Quanti is a practical course that blends theory, hands-on exercises and applied Techlog (Quanti). During the first 4 days participants work on a quad combo data set utilizing continuous interactive learning process; from lectures (data interpretation techniques and a quick overview of logging tool principles). Practical exercises

where properties are determined by hand and in Techlog (Quanti) maximizing the use of the software by applying all the available options.

COURSE CONTENT

- Course introduction and determining the expectations of the participants
- Pre course test
- VSH and Total Porosity Calculations using Density-Neutron
- Review results from previous day
- Density measurement and porosity calculation
- Neutron measurement and porosity analysis
- Effective Porosity Calculation and Resistivity Measurements
- Review results from previous day
- Compare VSH Results from Density-Neutron vs. SP and GR. Discuss and conciliate results
- Effective porosity determination and calculation. Correction for VSH and Hydrocarbon effects
- Review results from previous day
- Archie's equation and method will be discussed and reviewed
- Determination of Rw using different methods (SP, Rwa, Pickett Plot etc.) will be discussed and results will be consolidated.
- Calculation of Sw using Archie's Equation
- Quality control of results
- Review results from previous day
- Complete the post course test
- Data analysis
- Determine VSH, Porosity and Water Saturation

AUDIENCE

This course is intnded for any subsurface professional that is involved in log interpretation.

PREREQUISITE

Techlog Fundamentals.

Applied Core Analysis: How to Interpret Core Data

Skill – 5 Days

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
- Upscaling
- Preliminary characterization using core analysis, coring methods, and fluids data
- Lithology from a facies, sedimentary structure, and core description
- Fractured systems
- Characterization of pore geometry using diagenesis interpretation
- Clays and their impact on water saturation
- Total versus effective porosity
- Petrophysical rock types and differences between fluid contacts and free water level
- Rock electrical properties and their use in water saturation equations
- Relative permeability and wettability

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.

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 ressure 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
- WFT
- 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.

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.

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
- More basic statistics
- Permeability models
- Uncertainty and Upscaling
- Geological model analysis
- Hydrocarbon volumes initially in place
- Drainable volumes
- Simulation grid construction
- 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.

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 reservoirs 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 understanding 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 mode.

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.

Basic Logging Methods and Formation Evaluation

Skill – 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
- Borehole imaging

AUDIENCE

Petrophysicists, geoscientists, engineers, and log analysts wanting to increase their understanding of basic log analysis.

PREREQUISITE

A 2-year technical degree.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 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). 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.

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).
- Non-dispersive slowness time coherence (STC) processing workflow
- The importance of dispersion analysis for identifying best processing parameters
- Dispersive STC (DSTC) for dipole data
- Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
- Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
- Processing slownesses in challenging environment: Leaky-P processing
- 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)
- 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)

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 petroelum engineering.

Applied Capillary Pressure and Saturation Height Modeling

Advanced – 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, HPMI laboratory nuclear magnetic resonance, thin-sections, and scanning electron microscope (SEM) images. Clastics studies and core-log integration workshops are used 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 hyrdocarbon-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 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.

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.

Applied Reservoir Petrophysics and Characterization (APRC) - Customized for Clients

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.

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
- 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
- Isolation Scanner (Rotating Flexural wave)
- Corrosion Mechanisms
- Corrosion Monitoring Tools
- Cathodic Protection
- Perforation Conveyance
- Perforations Efficiency

AUDIENCE

Petrophysicists and production engineers responsible for field wide programs for reservoir monitoring or production logging.

PREREQUISITE

Greater than 2 years of experience interpreting cased hole logs or attendance in the Intermediate Production Logging and Reservoir Monitoring course is recommended.

Rock Physics: Integrating Petrophysical, Geomechanical, and Seismic Measurements

Advanced – 5 Days

his 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
- Rock physics templates
- Effective medium and effective field theories

- Velocity-porosity relations for carbonates
- Sediment compaction and the state of stress in the Earth
- Pore pressure and the concept of effective stress
- 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
- 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.

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 Rt 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.

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

- Field mapping of water flood to identify unswept zones
- X-well electromagnetic imaging

AUDIENCE

Petrophysicists and production engineers experienced with reservoir monitoring logging and log interpretation.

PREREQUISITE

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

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 (attendees are encouraged to bring difficult log examples for in-class discussion and interpretation).

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 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.

Techlog Python

Foundation – 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 programming skills, Python and Techlog platform 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 software
- Introduction to the Python editor
  - Opening and running scripts
- 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 database)
  - Custom plots (Techlog platform plot)
- Advanced scripting
  - Introduction to advanced basics such as multidimensional lists and dictionaries
  - Introduction to oriented object programming
- Reading and writing files
  - Text, CSV, and Excel files
  - Importing and loading data from Excel files
- Creating modules and custom libraries

AUDIENCE

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

PREREQUISITE

Techlog Fundamentals course.

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the

course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists and Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

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.

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

Skill – 3 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 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 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 algortihms.

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
  - 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
  - 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

Petrophysics, 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.

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 Wellbore Integrity Evaluation

Skill – 2 Days

This course will teach you how to use Techlog* to evaluate Pipe integrity and Cement hydraulic insolation 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 impedence
- 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 you 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.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

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.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 3 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). 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
- Understanding Logging-While-Drilling sonic data deliverables (real-time and in memory-mode)
- 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.
- 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)
- 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)

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.

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 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 resisitivity pay) module
- Perform a petrophysical summary on the thin bed results

AUDIENCE

Petrophysicists, Geologists, othe Geoscientists with prior experience of formation evaluation with Techlog.

PREREQUISITE

Techlog Fundamentals, Basic Petrophysics knowledge.

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. 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
  - Ex. 5--mode splicing & remedial
- QG LQC & 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

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
- QG Physics and Processing Overview
  - Ex. 1 - Process QG with default parameters
- QG Electromagnetics Fundamentals
- QG Physics
- 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 LQC & Deliverables
  - Ex. 6 - Challenge Competition
- QG Virtual Core & Virtual Slab
  - Ex. 6 - Challenge cont'd
- Challenge Results Presentations
- QG Inversion Principles & Demo
- TL Wbi interpretation Basics
- Open Discussion & Conclusion

COURSE CONTENT

Geologists, Petrophysicists and Geomechanics Specialists interpreting Quanta Geo images.

AUDIENCE

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 Reservoir Petrophysics

Advanced – 5 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 multiwell 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, 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.

Techlog Borehole Image Processing and 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.Elan

Advanced – 3 Days

This course introduces experienced log interpreters to building log interpretation models and generating solutions with the Quanti.Elan solver of Techlog. You will learn how to use the combiner to build a final model from several models and how to compute petrophysical results from the final model using the postprocessing method.

COURSE CONTENT

- Load and Quality Control data (from DLIS or LAS files)
- Pre-computations estimation of critical parameters for interpretations. These include mineral, rock and fluid endpoints and other petrophysical parameters.
- Log response equations with particular emphasis on neutron porosity and resistivity-based saturation equations
- Initialization
- Construction of Formation Evaluation models
- Zoning and Classification Groups
- Combining formation evaluation models
- Post Processing

AUDIENCE

Petrophysicists, Geologists, Log interpreters, and technical personnel with prior

experience of formation evaluation with Techlog.

PREREQUISITE

Techlog Fundamentals and Techlog Formation Evaluation

Applied Formation Evaluation and Basic Log Analysis Using Techlog (Quanti)

Skill – 5 Days

Applied Formation Evaluation and Basic Log Analysis Using Techlog - Quanti is a practical course that blends theory, hands-on exercises and applied Techlog (Quanti). During the first 4 days participants work on a quad combo data set utilizing continuous interactive learning process;

From lectures (data interpretation techniques and a quick overview of logging tool principles). Practical exercises where properties are determined by hand and in Techlog (Quanti) maximizing the use of the software by applying all the available options.

COURSE CONTENT

- Course introduction and determining the expectations of the participants
- Pre course test
- SP and GR Theory
- VSH and Total Porosity Calculations using Density-Neutron
- Review results from previous day
- Density measurement and porosity calculation
- Neutron measurement and porosity analysis
- Effective Porosity Calculation and Resistivity Measurements
- Review results from previous day
- Compare VSH Results from Density-Neutron vs. SP and GR. Discuss and conciliate results
- Water Saturation Calculation using Archie's Equation and Summaries
- Review results from previous day
- Archie's equation and method will be discussed and reviewed
- Multi-Well Basic Log Interpretation Workshop
- Review results from previous day
- Determine VSH, Porosity and Water Saturation

AUDIENCE

This course is intnded for any subsurface professional that is involved in log interpretation.

PREREQUISITE

Techlog Fundamentals.

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). 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.

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
- 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)
- Transmitter mode and Depth-Derived BoreHole Compensation (DDBHC)
- Processing slownesses in challenging environment: Leaky-P processing
- 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)
- 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 petroelum engineering.

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 pracitcal 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 petrophsyical 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

- 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.

Introduction to Cased-Hole Data Acquisition and Interpretation

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.
- 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.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

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.

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

Reservoir	Drilling	Unconventional Reservoirs	COMPETENCY LEVEL
Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics			ADVANCED
Advanced Petroleum Geomechanics			
Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements			
Reservoir Geomechanics with Petrel	Deepwater Geohazards	Practical Aspects of Shale Gas Geomechanics	SKILL
Practical Petroleum Geomechanics with Techlog		Mangrove Express Hydraulic Fracture Design	
	Pore Pressure Prediction Methods using Techlog	Geomechanics Applications in Heavy Oil	
		Geomechanics Applications in Coal-Bed Methane	
		Geomechanics Applications in Shale Gas	
	Geomechanics for Drilling Engineers		FOUNDATION
Fundamentals of Petroleum Geomechanics			

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | **SOFTWARE** | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Petrel	Techlog	Mangrove
ADVANCED		Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics	
		Techlog Geomechanics	Mangrove Hydraulic Fracture Design Software
SKILL	Petrel Reservoir Geomechanics	Techlog Acoustics Processing and Interpretation	
FOUNDATION		Studio for Techlog Users	

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 .

DOMAIN | SOFTWARE | **INTEGRATED/BLENDED** | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Reservoir	Drilling	Unconventional Reservoirs
SKILL	Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics		
	Practical Petroleum Geomechanics with Techlog		
	Reservoir Geomechanics with Petrel		

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | **VIRTUAL CLASSROOM**

COMPETENCY LEVEL	Drilling	Techlog
SKILL	Mechanical Earth Model Building	Techlog Wellbore Integrity VILT

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
- State of stress in the Earth, pore pressure, and fracture gradient
- 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

Non.

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, 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
- 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
- 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
- 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 geomechnic 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
- Geo-hazards Identification , Understanding risk & Mitigation

AUDIENCE

Geophysicists, geologists and drilling engineers.

PREREQUISITE

Basic understanding of geology and geophysics.

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
- Understanding Earth Stresses includes
- Mechanical Earth Modeling includes
- Shale Anisotropy and Heterogeneity includes -
- Anisotropy and Stress in Shales –
- Drilling through Shale includes -
- Hydraulic fracturing and Shale stimulation -
- Introduction to Microseismics -
- 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 involved in exploration, drilling, completions and production in unconventional reservoirs.

PREREQUISITE

4 years of Geoscience or engineering degree.

Practical Petroleum Geomechanics with Techlog

Skill – 5 Days

This course covers the fundamentals of geomechanics for wellbore applications. It covers the topic of the origin of stresses in the subsurface and how in situ stresses can be understood from wellbore data. Mechanical properties such as rock strength and elastic properties are introduced and their determination in the laboratory as well as from log data is discussed. The origins of pore pressure and how it is measured and estimated is discussed and shown. The course then proceeds to show how all discussed concepts can be put together to build a Mechanical Earth Model and how this is used to examine critical problems in exploration and field development.

COURSE CONTENT

- Fundamentals of well-centric geomechanics
- Value of well-centric geomechanics in the petroleum industry
- Techlog Introduction and basic exercises: General overview of Techlog, data loading and QC, building a mechanical stratigraphy
- Concept and construction of the Mechanical Earth Model, data requiremens and types of input data
- Techlog exercises on modeling mechanical properties and calibration with core data
- Techlog basics of Acoustic log processing and QC
- Introduction to Python in Techlog and how to script locally-calibrated rock property correlations
- Origins of pore pressure, methods for measurement, methods for estimation, vertical and horizontal methods, Eaton's method, real-time approach
- Techlog exercises on modeling overburden, pore pressure and horizontal stress magnitude
- Introduction to Techlog image log functionalities and stress direction analysis
- Wellbore geomechanics, state of stress in the wellbore
- Modes of rock deformation in the wellbore, the effect of well azimuth and
- inclination, simple calculations
- An introduction to planning for wellbore stability and real time operations

- Introduction to Hydraulic fracturing, process of hydraulic fracturing, geomechanical factors effecting fracture development and simple calculations
- Techlog exercise to use 1DMEM for sand production prediction
- Rock mechanical properties and introduction to the Mechanical Earth model
- 1D Stress modeling (overburden, pore pressure and horizontal stresses)
- Wellbore stresses and wellbore stability
- Completions geomechanics

AUDIENCE

Geomechanicists, geologists, geophysicists, drilling engineers, production engineers, completion engineers, and reservoir engineers.

PREREQUISITE

Basic understanding of Petroleum exploration and production.

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.

Pore Pressure Prediction Methods using Techlog

Skill – 5 Days

A predrill estimate of formation pore pressure is a key requirement for successful exploration and drilling. During the exploration phase, knowledge of the spatial distribution of formation pressures can be used to develop fluid migration models, to study the effectiveness of seals, and to rank prospects. During the drilling phase, a pre-drill pore pressure estimate allows the appropriate mud weight to be selected and the casing program to be optimized, thus enabling safe and economic drilling. This course will cover the fundamental principles of pore pressure modeling and application to oil field problems.

COURSE CONTENT

- Introduction. Geological occurrence and processes responsible for abnormal pressure (disequilibrium compaction, fluid expansion, smectite/illlite transformation, hydrocarbon generation).
- Data audit, data requirements and how to deal with data gaps. Overview of data types necessary for real time monitoring and model updating. Estimation of stresses: Density and the calculation of vertical stress. Practical exercise on vertical stress determination.
- Advanced methods: Impact of faults on pore pressure prediction. Uncertainty, real-time updating and how real time updating reduces uncertainty ahead of the bit. Sub-salt pore pressure prediction.
- 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 and risks associated with drilling operations.

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.

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.

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

- Computation of mechanical properties and strength parameters from logs
- Understanding Mohr circle and Mohr-Coulomb criterion for rock failure
- 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
- 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.

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
- 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.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 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
- 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)
- 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
- 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.

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
- 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

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
- Sediment compaction and the state of stress in the Earth
- Pore pressure and the concept of effective stress
- 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
- 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.

Studio for Techlog Users

Foundation – 2 days

- Overview and basic concepts

- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists and Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

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.

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

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

PREREQUISITE

Techlog Fundamentals.

Techlog Geomechanics

Advanced – 5 Days

The Techlog Geomechanics course covers the fundamental theory of geomechanics for pore pressure, 1D mechanical earth model (MEM) construction, wellbore stability & completion geomechanics applications using Techlog* wellbore software platform on real examples.

The course presents pore pressure prediction concepts using the effective stress method (Eaton, Bowers, Traugott). The steps to build a MEM, which is comprised of computing dynamic & static elastic properties, rock strength properties and the orientation & magnitudes of the horizontal stresses, are introduced. The theory of wellbore stability theory is discussed in detail which covers the concepts of rock failure, thermal stresses, depth of damage and failure image prediction. Using multiple exercise, participants build a calibrated mechanical earth model with Techlog, construct a mud weight window, and identify drilling hazards. Completion Geomechanics introduces a workflow which provides input for sand management decisions (optimized drawdown pressure, perforation orientation & size etc).

COURSE CONTENT

- Pore Pressure Prediction and Overburden stress
- Mechanical Earth Model Elastic properties
- Rock strength and
- Horizontal stresses
- Wellbore stability
- Completion Geomechanics Sand management
- Fracture stability analysis

AUDIENCE

Geomechanics engineers, Operations Geologist, Drilling Engineers, Geophysists, Petrophysists and Anyone working in fields related to Geomechanics.

PREREQUISITE

Basic Techlog knowledge and Some Basic Geomechanics domain knowledge.

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.

Practical Acoustics with Techlog - Applications for Geomechanics and Petrophysics

Advanced – 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).

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
- Theory of semblance processing and slowness estimation from array waveform data
- The importance of dispersion analysis for identifying best processing parameters
- Dispersive STC (DSTC) for dipole data
- 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)
- 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)

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 petroelum engineering.

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
- 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)

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 petroelum engineering.

Practical Petroleum Geomechanics with Techlog

Skill – 5 Days

This course covers the fundamentals of geomechanics for wellbore applications. It covers the topic of the origin of stresses in the subsurface and how in situ stresses can be understood from wellbore data. Mechanical properties such as rock strength and elastic properties are introduced and their determination in the laboratory as well as from log data is discussed. The origins of pore pressure and how it is measured and estimated is discussed and shown. The course then proceeds to show how all discussed concepts can be put together to build a Mechanical Earth Model and how this is used to examine critical problems in exploration and field development.

COURSE CONTENT

- Value of well-centric geomechanics in the petroleum industry.
- Techlog Introduction and basic exercises: General overview of Techlog, data loading and QC, building a mechanical stratigraphy.
- Introduction to experimental rock mechanics, uniaxial and triaxial testing,

scratch testing, tensile tests, results analysis

- Concept and construction of the Mechanical Earth Model, data requiremens and types of input data
- Techlog exercises on modeling mechanical properties and calibration with core data
- Techlog basics of Acoustic log processing and QC
- Origins of pore pressure, methods for measurement, methods for estimation, vertical and horizontal methods, Eaton's method, real-time approach
- Techlog exercises on modeling overburden, pore pressure and horizontal stress magnitude
- Wellbore geomechanics, state of stress in the wellbore
- Modes of rock deformation in the wellbore, the effect of well azimuth and inclination, simple calculations
- An introduction to planning for wellbore stability and real time operations
- Introduction to Hydraulic fracturing, process of hydraulic fracturing, geomechanical factors effecting fracture development and simple calculations
- Techlog exercise to use 1DMEM for sand production prediction

AUDIENCE

Geomechanicists, geologists, geophysicists, drilling engineers, production engineers, completion engineers, and reservoir engineers concerned with well planning.

PREREQUISITE

Basic understanding of Petroleum exploration and production and Familiarity with Techlog Base modules.

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
- 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
- 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.

Mechanical Earth Model Building

Skill – 2 Days

The Mechanical Earth Model Building course is a VILT (virtually instructor led training) delivered in real time. The course will be delivered in 4 hour segments over a 2 day period and is delivered using the WebEx platform. This course is designed to introduce geomechanics workflows that are used to build wellbore-centric Mechanical Earth Models (1D MEM). The course will combine virtual lectures with short software demonstrations. The theoretical foundation to understand wellbore geomechanics is introduced by lectures on the state of stress in the earth, pore pressure, rock mechanics properties and their measurements, as well as the application of a 1D MEM to wellbore stability analysis.

COURSE CONTENT

- Introduction to rock mechanics fundamentals: Stress vs. strain, concept of principal stresses, rock mechanics properties (elasticity, plasticity, yield, failure), Mohr-Coulomb failure criterion
- Theory and estimation of overburden stress
- Origins of pore pressure, methods for measurement, methods for estimation (Eaton's approach, Bower's equation)
- Experimental rock mechanics, typical test geometries, results analysis, determine rock properties from log and calibrate to core data
- Principal stresses in the earth (overburden stress, horizontal stress orientation, horizontal stress magnitudes) and their determination in the 1D MEM
- Wellbore stability, state of stress in the wellbore, modes of failure and rock deformation in the wellbore, calculation of wellbore stability and effect of well azimuth and inclination
- 1D MEM calibration through post-drill analysis of wellbore stability

AUDIENCE

Geologists, geophysicists, drilling engineers, production engineers, completion engineers, reservoir engineers, exploration supervisors and managers concerned with well-centric geomechanics modeling and wellbore stability.

PREREQUISITE

Each student will need the fooling to attend: Computer, USB Headset, Video Capabilities (720HD), Access to internet, MS Office.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches.A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

This course will teach you how to use Techlog* to evaluate Pipe and Cement integrity with wireline logging measurements. You will use both Radius and thickness as inputs in pipe evaluation while cement bond log, CBL amplitude and acoustic impedence, AIM will be use as input for cement hydraulic isolation evaluation.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Reservoir Characterization	Reservoir Analysis	Reservoir Management
ADVANCED	Characterization, Evaluation and Enhanced Oil Recovery in Naturally Fractured Reservoirs		
	Full Life Cycle Fluid Evaluation - Downhole to Laboratory	Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane	
	Assuring Flow From Pore to Process: Basics, Modeling, and Lab	Analysis of Production Performance Curves	Simulation of Naturally Fractured Reservoirs
			Resources and Reserves Evaluation
			History Matching and Reservoir Optimization
SKILL		Applied Reservoir Simulation	
	PVT Properties of Petroleum Fluids: Theory and Applications	Reservoir Geomechanics with Petrel	
	Techlog Saturation Height Modelling	Formation Testing: Wireline and LWD	Reservoir Management and Monitoring
	Waterflood Management		
	Applied Geostatistics for Petroleum Engineers and Geoscientists		
	Advanced Well Test Analysis		
	Petrel Reservoir Engineering		
	Applied Reservoir Engineering		
FOUNDATION	ECLIPSE Blackoil Reservoir Simulation		Fundamentals of Field Development Planning
		Enhanced Oil Recovery Processes: Chemical, Miscible, and Thermal	
	Well Test Design and Analysis		Natural Gas Reservoir Engineering
	PVT Properties of Reservoir Fluids		Integrated Reservoir Management
	Practical Reservoir Engineering with Petrel and ECLIPSE		
	Introduction to Reservoir Engineering		

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

ECLIPSE	Petrel	OFM	MEPO	Techlog	COMPETENCY LEVEL
		OFM Waterflood Monitoring and Surveillance	MEPO Advanced	Techlog Reservoir Petrophysics	ADVANCED
		OFM Reservoir Optimization			
ECLIPSE Advanced Topics	Initializing simulation models	OFM Intermediate Using Oil Operations Examples		Techlog Saturation Height Modelling	SKILL
ECLIPSE Compositional Simulation	Petrel Advanced Wells	OFM Intermediate Using Gas Operations Examples		Techlog Formation Pressure Analysis	
Chemical Methods for Enhanced Oil Recovery with ECLIPSE				Techlog Wellbore Integrity VILT	
	Petrel Reservoi Geomechanics			Techlog Formation Evaluation	
Applied Reservoir Simulation with ECLIPSE	Petrel Reservoir Engineering				
	Petrel Well Design				
	Petrel Workflow Editor and Uncertainty Analysis				
	Petrel Production Data Interpretation and Forecasting				
	Petrel Uncertainty Analysis and Optimization Fundamental				
	Petrel Reservoir Engineering 3 Days	OFM Fundamentals Using Gas Operations Examples	MEPO Uncertainty and Optimization Fundamental	Studio for Techlog Users	FOUNDATION
ECLIPSE Blackoil Reservoir Simulation	Studio for Petrel Users	OFM Fundamentals Using Oil Production Examples			
FrontSim Streamline Reservoir Simulation		OFM Fundamentals			
	Petrel Fundamentals	OFM Analysis Dashboard		Techlog Fundamentals	AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	PIPESIM	INTERSECT	Mangrove	Infrastructure	Integrated Asset Modeler
ADVANCED		INTERSECT Reservoir Simulation - Advanced	Mangrove Hydraulic Fracture Design Software	Cluster Management for IT Professionals	
SKILL		INTERSECT Reservoir Simulation			Integrated Asset Modeler Fundamentals
FOUNDATION	PIPESIM Fundamentals				
AWARENESS				Introduction to Cluster Configuration and High Performance Computing for Reservoir Engineers	

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

Reservoir Characterization	Reservoir Analysis	Reservoir Management	COMPETENCY LEVEL
		Simulation of Naturally Fractured Reservoirs	ADVANCED
		History Matching and Reservoir Optimization	
	Reservoir Geomechanics with Petrel		SKILL
PVT Properties of Petroleum Fluids: Theory and Applications	Formation Testing: Wireline and LWD		
Petrel Reservoir Engineering			
ECLIPSE Blackoil Reservoir Simulation			FOUNDATION
Practical Reservoir Engineering with Petrel and ECLIPSE			

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 .

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Reservoir Characterization	Reservoir Analysis	Reservoir Management	Techlog
SKILL	Petrel Fracture Modeling: Discrete Fracture Network Construction			Techlog Wellbore Integrity VILT
	Initializing simulation models			
	Well and Group Control techniques in Reservoir Simulation			
FOUNDATION		Introduction to EOR		
	Reservoir Engineering for Non-Reservoir Engineers			

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
- 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
- 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

- Basic concepts of reservoir performance
- Fundamental concepts of well test analysis
- Dimensionless variables, derivative analysis and diagnostic plot, type-curve matching, wellbore storage, radial flow, late-time boundary, and depletion effects
- Well test interpretation in naturally fractured reservoirs, fractured wells, and horizontal wells
- Variable rate analysis methods and multiwell testing
- Well test analysis in gas reservoirs, modifications for gas and multiphase flow, and phase redistribution
- Drillstem testing, design, and analysis
- Well test design

AUDIENCE

Reservoir engineers, production engineers, and field personnel involved with the design and interpretation of well tests.

PREREQUISITE

Degree in engineering and prior experience with well testing.

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

- Fluids and fluid types
- Drive mechanisms
- Properties of natural gas
- Material balance
- Determining gas reserves
- Basic gas deliverability
- Deliverability of gas wells
- Introduction to nodal analysis
- Inflow performance for gas wells
- Outflow or tubing curves
- Production data analysis
- Modification for gas
- Manual log analysis
- Type curve analysis
- Well test analysis using type curves

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
- 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.

Integrated Reservoir Management

Foundation – 5 Days

ourse 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.

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
- Principles of Reservoir Simulation
- History Matching and Prediction

AUDIENCE

This course is designed for non-reservoir engineers such as geologists, geophysicists, petrophysicists working in exploration and exploitation.

PREREQUISITE

Previous Petrel or Eclipse knowledge is not a prerequisite for this course.

Introduction to Reservoir Engineering

Foundation – 5 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 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.

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 as well as upscaling and simulation techniques. Tutorials include use of ECLIPSE* simulator software but prior experience with this simulator is not required.

COURSE CONTENT

- Fundamentals of reservoir simulation
- Types of models: Black oil compositional, thermal, miscible, dual porosity
- Data used in a reservoir simulation study
- Practical guidelines for use of reservoir simulators
- Applications of reservoir simulation
- Identification of models needed
- Uses and misuses of simulation
- Effect of time and space discretization
- Small-scale and field-scale models
- Modeling faults and aquifers
- Workshop: Problem solving using related software applications

AUDIENCE

Engineers, geologists, geophysicists, managers, and other oilfield technical staff.

PREREQUISITE

Basic understanding of petroleum engineering and geologic concepts.

PVT Properties of Petroleum Fluids: Theory and Applications

Skill – 5 Days

This course will present the methods for obtaining values of reservoir fluid properties from laboratory data and correlations. Chemical properties of hydrocarbons, conventional laboratory PVT (Pressure-Volume-Temperature) tests and quality control will also be covered. Participants will learn about phase diagrams, mixing rules, EOS, EOS tuning, and fluid properties while attending this course.

COURSE CONTENT

- Phase Behavior of single and multi-component systems
- Miscibility concept
- Reservoir Fluids
- Ideal and Non-Ideal Gas-Liquid Equilibrium
- Evaluation of phase boundaries and flash equilibrium with EOS
- Cubic Equation of State
- Solution of van der Waals EOS
- Fugacity Evaluations
- PVT-VLE Evaluation
- Tuning of Equations of State
- Surface Separation and example separator Calculations
- PVT sampling methods , quality control and sample selection
- Complex Fluid sampling
- Decontamination algorithms
- Load sample/sample(s) into PVTi
- If gas condensate/volatile oil sample, perform material balance calculations on CVD experiment
- Tune EoS using lab measurements CVD/DL, CCE, separator tests, swelling experiments (this can be very time consuming for multiple samples)
- Split tail of sample

AUDIENCE

Engineers who are dealing with PVT properties of petroleum fluids.

PREREQUISITE

PVTi awareness.

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
- 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.

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.

PREREQUISITE

Basic understanding of Petrophysics and Techlog Fundamentals.

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 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
- 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
- IInitialization 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
- 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.

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 CO_2 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 upscaling 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 CO_2, 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)

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.

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: Basics, Modeling, and Lab

Advanced – 5 Days

Impediment to flow caused by either fluid phase behavior coupled with the dynamics of flow and/or production-chemistry-related issues. These issues in the wellbores and flow lines have long been identified in onshore and offshore shallow-water environments. These events became more severe in deepwater environment as the intervention is challenging from both technical and cost considerations. Naturally, these situations demand careful consideration of the fluid phase behavior, flow dynamics, and production chemistry aspects at the design phase of field development.

COURSE CONTENT

- Introduction and PVT Characterization
- Identification methodologies
- PVT characteristics
- Capturing fluid samples
- Laboratory Solids Characterization
- Measurement methodologies
- Reservoir fluid compositions
- Potential production impediments
- Integration Concepts and Field Example of Management Approaches
- Fluid flow and heat transfer
- Systematic and holistic flow assurance
- Flow Assurance Modeling
- Flow assurance with transient models
- Flow assurance with integrated asset models
- Visit to Technology Center Laboratory
- Introduction to phase behavior
- Solid detection system (SDS)

AUDIENCE

This course is intended for engineers and chemists in the upstream and downstream segments of the petroleum industry, as well as technology managers with an appreciation of the risks, challenges, and solutions for the free flowing hydrocarbon product.

PREREQUISITE

Four year Engineering or Geoscience degree plus five years of work experience..

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

Advanced – 5 Days

This course 5-day 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.

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 simple grid
- Geometrical modeling

AUDIENCE

Development and Exploration Geologists, Geophysicists, Geochemists, 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 Managment courses.

OFM Analysis Dashboard

Awareness – 2 Days

This course introduces OFM Analysis dashboard as powerful data visualization tool helping you revel information to support better decision-making. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and shared results. You will learn to create highly efficient dashboards for production surveillance, project economics assessment, data mining, and data quality control.

COURSE CONTENT

- Introduction to OFM analysis dashboard

AUDIENCE

Anyone interested in gaining a general understanding of OFM Analysis Dashboard.

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.

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 multiwell use.

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.

Introduction to Cluster Configuration and High-Performance Computing for Reservoir Engineers

Awareness – 2 Days

This course is a short 2-day introduction to high-performance computing (HPC) for reservoir engineers. The key objective is to provide a better understanding of what is needed from the HPC perspective to run simulations faster. The course will cover clusters, queuing, and working with certified systems. Some of the topics covered include the simulation software products and their installation, release procedures, naming conventions, operating systems, licensing, and certified systems.

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.

Petrel Reservoir Engineering 3 day

Foundation – 3 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.

OFM Fundamentals Using Gas Operations Examples

Foundation – 2 Days

This course introduces you to the primary functionalities of OFM by allowing you to interact with a pre-prepared gas well operations project. The flow of the course centers on you acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in OFM. As the course progresses, it covers each of the tasks. In accomplishing the tasks, you are exposed to the range of common features of the application. During the course, you will learn how to use OFM 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, providing 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 softwarePrerequisite.

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.

MEPO Uncertainty and Optimization Fundamental

Foundation – 3 Days

Sensitivity, subsurface uncertainty assessment, and history matching studies for calibrating reservoir simulation models are integral workflow tasks in many reservoir simulation studies. The course is designed to provide the petroleum engineers with software skill and modeling techniques required to perform the tasks of managing reservoir uncertainties and optimization. It discusses how to use MEPO uncertainty and optimization tools to perform sensitivity analysis, uncertainty assessment, and optimization (history matching) and also covers the proxy modeling concepts, benefits, limitations and its applications using the avaliable workflow tools in MEPO.

COURSE CONTENT

- Introduction to Sub-surface Uncertainty Quantification
- Basic definitions for uncertainty and risk
- Discussion on sources of uncertainty and risk in the petroleum industry
- Explanation of dependencies and interactions between input parameters
- Discussion on MEPO processes which involves; Task management, Input parameter, Response parameters and Case management.
- Python and how to customize processing tasks using Python and also writing MEPO-specific Python scripts
- Pre-processing and post-processing loop in MEPO, including selected Python scripts
- Explanation of Proxy modeling concepts, application, benefits and limitation
- Discussion on how to identify application scenarios for proxy models
- How to define a training dataset for proxy model and creation of proxy model
- Validation of proxy model and how to create tests for evaluating proxy predictability

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

Ability to use ECLIPSE reservoir simulator.

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists and Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

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.

Studio for Petrel Users

Foundation – 1 Days

The Studio for Petrel Users 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.

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 the attendees are exposed to the range of common features of the software application.

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.

OFM Fundamentals

Foundation – 2 Days

The OilField Manager (OFM) Fundamentals course introduces new users to OFM functionality with emphasis on visualization, reporting, and data analysis. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and share results.

COURSE CONTENT

- A brief walkthrough of a fully functioning project, providing 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
- Explore OFM analysis dashboard
- Create and format well and field summary reports
- Export reports and table data to other applications

AUDIENCE

Anyone interested in gaining a general understanding of OilField Manager (OFM).

PREREQUISITE

An interest in using OFM software.

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
- 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

Skill – 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 wabinar focuses on the three main approaches (Equilibration, Enumeration, and restart file) used to define the initial conditions of a reservoir model.

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.

AUDIENCE

Reservoir Engineers involved in the reservoir appraisal and field development projects.

OFM Intermediate Using Oil Operations Examples

Skill – 2 Days

This 3-day course extends the work done in the Fundamentals course and iThis course extends the work done in the Fundamentals course and introduces two key areas of functionality: forecasting and mapping.

Forecasting: OFM offers a highly interactive module for the user to history match and subsequently forecast production. The widely used Arps technique is covered, and you 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 make effective use of the results are explained.

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
- Ratio forecasts
- Calculated forecasts
- Forecast reports

AUDIENCE

Development geoscientists, development reservoir engineers, production engineers.

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.

PREREQUISITE

Basic Petrophysics and Techlog Fundamentals.

INTERSECT Reservoir Simulation

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

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.

ECLIPSE Compositional Simulation

Skill – 5 Days

In this course on the ECLIPSE Compositional finite-difference simulator, attendees will learn how to study complex hydrocarbon behavior problems and compositional changes that occur in geologically complex reservoirs when the hydrocarbon is condensate or when crude oil is volatile.

COURSE CONTENT

- Black-oil and compositional models: Definitions, equations, assumptions, approximations, and unknowns
- PVT practices and phase behaviors
- Structure and keywords
- Miscible, immiscible, and water-alternating-gas (WAG) displacement of an oil and gas injection into condensates
- Use of ECLIPSE PVTi and ECLIPSE Compositional simulator to model slim-tube displacements
- Full-field compositional models
- First contact miscibility
- Condensing gas drive and vaporizing gas drive
- Thermodynamics
- Solution scheme
- Flash calculation
- EOS
- Viscosity correlations
- Characterization and component lumping
- Surface tension effects
- Near-critical oil and gas relative permeability
- Standard laboratory experiments
- Diffusion processes in compositional simulation
- Numerical dispersion and grid orientation nine-point scheme
- Perform gas-water and CO2 water solubility modeling
- Tracer tracking of compositional components

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.

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 withabove 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 course extends the work done in the Fundamentals course and introduces two key areas of functionality: forecasting and mapping.

Forecasting: OFM offers a highly interactive module for the user to history match and subsequently forecast production. The widely used Arps technique is covered, and you 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 make effective use of the results are explained.

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.

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 and Operation Geologists.

PREREQUISITE

Techlog Fundamentals and Basic Petrophysics .

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
- Chemicla 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

AUDIENCE

Reservoir and simulation engineers working on enhanced oil recovery studies.

PREREQUISITE

Reservoir Engineering background with good knowledge in using ECLIPSE.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole and Geologists.

PREREQUISITE

Techlog Fundamentals.

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.

Techlog Formation Evaluation

Skill – 2 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.

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

AUDIENCE

Development and exploration log analysts and Petrophysicists with limited or no experience using Techlog software.

PREREQUISITE

Techlog Fundamentals.

Applied Reservoir Simulation with ECLIPSE

Skill – 5 Days

This 5-days course is designed to introduce the participants to the theory and practice of reservoir simulation. Participants will learn about the funda-mentals of reservoir simulation, the development of simulation programs, and how to select the proper model for a simulation study. This course also covers data preparation, grid design, calibration of the reservoir model, forecasting of future performance, and interpretation of simulation results.

COURSE CONTENT

- Introduction to reservoir simulation and its benefits
- Traditional reservoir engineering methods and their direct relationships with reservoir simulation
- Minimum data required to run a simulation study
- Mass balance of a single phase in a control volume representative of the porous medium
- Different formulations (IMPES, fully implicit, AIM) used to evaluate the spatial differences on the simulator equation
- Linearization of the simulator equations and the methods used to solve the simulator equations
- Discussion on basic use of single well simulation models
- Importance of vertical layering on the dynamic behavior of reservoir fluids
- What vertical equilibrium is and in what reservoir situation it occurs
- History matching and its objectives
- History matching process and prediction of reservoir performance.
- Computer aided history matching
- Discription of factors that affect the water fractional flow
- Fluid and rock data required in a reservoir simulation study and description of the sources of reservoir data
- Hysteresis and its effect in reservoir displacements
- Reasons why you might or might not wish to simulate a reservoir
- The steps involved in a simulation study
- ECLIPSE input data file sections and how ECLIPSE works
- Variograms and how they are used in geostatistics
- UMBB Case study : steps used to conduct a reservoir simulation study

AUDIENCE

Reservoir engineers, geoscientists, and other technically trained individuals.

PREREQUISITE

Reservoir engineering background.

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 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 streamlined 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.

Petrel Uncertainty Analysis and Optimization Fundamental

Skill – 3 Days

Subsurface uncertainties assessment is an essential phase in any field development strategy. This course learning contents are design to provide the reservoir engineers with the concepts and necessary application skills for uncertainty assessment quantification and optimizations using Petrel workflows tools. There are several ways to analyze and quantify uncertainties in Petrel, whether those uncertainties are associated with a single modeling process, such as a hydrocarbon contact depth in a 3D static model, or a combination of several interdependent processes ranging from seismic to simulation and economic forecasting.

COURSE CONTENT

- Basic definitions for uncertainty and risk
- Discussion on sources of uncertainty and risk in the petroleum industry
- Explanation of dependencies and interactions between input parameters
- Discussion on how to create a new workflow and the modification of an existing workflow using Edit workflow
- How to generate a Reset original workflow and how to use it
- Description on how to use different options in avaliable in Edit workflow tool to include a process in or exclude it from the uncertainty workflow loop

- Explanation of Proxy modeling concepts, application, benefits and limitation
- Discussion on how to define a proxy model, training a proxy model , validation and application of proxy model using Petrel workflow tools

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

This course builds on the Petrel Reservoir Engineering course. So the knowlegde of Petrel Reservoir Engineering workflow tools or equivalent Petrel experience is required.

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.

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. 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.

Techlog Reservoir Petrophysics

Advanced – 5 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 multiwell 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.

INTERSECT Reservoir Simulation - Advanced

Advanced – 3 Days

This course learning contents are designed to build on the INTERSECT Reservoir Simulation fundamental course. The advanced course provides a variety of advanced features for both setting up and controlling reservoir simulations.INTERSECT provides a variety of advanced features for both setting up and controlling reservoir simulations. These provide the reservoir engineer a great deal of flexibility in how he sets up and controls his or her reservoir simulation. The course focusses on the 4 key areas of functionality.

COURSE CONTENT

- Initializing Black Oil Models
- Initializing Gas Condensate models
- Initializing Critical Fluids
- Initializing Compositional models of Oil reservoirs
- Managing gas re-injection strategies
- Pressure maintenance
- Production balancing with gas re-injection
- Creating and controlling sequences of injections to manage the reservoir

- Applying resource constraints to actions
- Connecting a network simulator to INTERSECT
- Using ENS to simulate the effect of a production network.

AUDIENCE

Reservoir Engineers who have attended the INTERSECT reservoir simulation Fundamentals course and who want to learn more about INTERSECT.

PREREQUISITE

To successfully complete this course, you must have attended INTERSECT Reservoir Simulation fundamentals.

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.

OFM Reservoir Optimization

Advanced – 5 Days

This is a "hands on" workshop where participants will be able to apply engineering principals in a real world scenario. The reservoir will be developed through multiple phases – 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 workover existing wells and drill new wells in order to improve field recovery. A limited budget will be given in order to perform economic evaluations and prioritize future work programs.

COURSE CONTENT

- Reservoir familiarization
- Reservoir evaluation
- Calculating volumetric OOIP
- Production phase familiarization
- Workover candidate recognition
- Evaluating reservoir performance
- Advanced decline curve analysis
- Well volumetric drainage radius
- Horizontal well analysis
- Workover follow-up
- Additional workover candidate recognition
- Waterflooding pilot analysis
- Waterflood evaluation

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 coarse or at least three months of application usage with OFM 2012, as well as basic knowledge of oil and gas production, Microsoft ® Excel spreadsheets, and basic algebra.

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.

Practical Reservoir Engineering with Petrel and ECLIPSE

Foundation – 5 Days

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
- Oil and gas well performance
- Oil displacement concepts
- Well Testing and Analysis
- Hydrocarbon reserves volumetric method
- Well Decline Curve Analysis
- Material Balance Concepts
- Principles Of Well Testing
- Principles of Reservoir Simulation
- Building a simulation model in Petrel
- History Matching and Prediction

AUDIENCE

This course is designed for non-reservoir engineers such as geologists, geophysicists, petrophysicists working in exploration and exploitation.

PREREQUISITE

Previous Petrel or Eclipse knowledge is not a prerequisite for this course.

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
- Geomechanical property modeling and stress initialization with PetrelRG
- Coupled reservoir Geomechanics simulation with PetrelRG
- Reservoir geomechanics model results analysis with PetrelRG

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.

PVT Properties of Petroleum Fluids: Theory and Applications

Skill – 5 Days

This course will present the methods for obtaining values of reservoir fluid properties from laboratory data and correlations. Chemical properties of hydrocarbons, conventional laboratory PVT (Pressure-Volume-Temperature) tests and quality control will also be covered. Participants will learn about phase diagrams, mixing rules, EOS, EOS tuning, and fluid properties while attending this course.

COURSE CONTENT

- Phase Behavior of single and multi-component systems
- Miscibility concept
- Reservoir Fluids
- Equations of State for Ideal and Real Gases
- PVT Properties of Natural Gas

- Ideal and Non-Ideal Gas-Liquid Equilibrium
- Evaluation of phase boundaries and flash equilibrium with EOS
- Cubic Equation of State
- Solution of van der Waals EOS
- Fugacity Evaluations
- Tuning of Equations of State
- Surface Separation and example separator Calculations
- PVT sampling methods , quality control and sample selection
- Complex Fluid sampling
- Decontamination algorithms
- Load sample/sample(s) into PVTi
- If gas condensate/volatile oil sample, perform material balance calculations on CVD experiment
- Tune EoS using lab measurements CVD/DL, CCE, separator tests, swelling experiments (this can be very time consuming for multiple samples)

AUDIENCE

Engineers who are dealing with PVT properties of petroleum fluids.

PREREQUISITE

PVTi awareness.

Formation Testing: Wireline and LWD

Skill – 5 Days

This five day course will consist of theoretical and practical classroom session with the last day of the course being devoted to Wireline, Logging While Drilling (LWD), and Pressure Volume Temperature (PVT) lab to see Formation Testing (FT) tools and PVT lab facilities/experiments. This course will also include all FT applications, including pressure surveys, gradient analysis, sampling and downhole fluid analysis, FT pressure transients, and FT In-Situ Stress testing.

COURSE CONTENT

- Reservoir Engineering Fundamentals
- InSituPro software
- Wireline Formation Testing (WFT) tools and hardware
- Pretesting and Pressure Gradient Analysis
- Pressure Transient Interpretation
- Advanced Downhole Fluid Analysis and reservoir characterization
- Sampling and Fluid Analysis while Drilling (LWD)
- In-Situ Stress Testing with MDT
- Hands on exercises
- Laboratory visits

AUDIENCE

Reservoir engineers, Geoscientists, Operations Geologists, well log witnesses with little or no prior knowledge of formation testing services.

PREREQUISITE

A familiarity with the basics of reservoir engineering and formation evaluation concepts.

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

- Introduction to Petrel Reservoir engineering workflows
- Overview of the Petrel user interface focusing on typical reservoir engineering workflow
- How to create a simple simulation grid using different gridding techniques s in Petrel
- How to set up a simulation case
- Intialization of simulation model workflow and volume calculation
- How to import an OFM project and Observed data (.vol)
- How to create fault transmissibity multiplier using Structural and Fault analysis tool
- Introduction to Well Engineering workflow in Petrel
- How to use Well manager and well report options in Petrel for quality checking
- Introduction to aquifer modeling and local grid refinement in Petrel
- Conversion of ECLIPSE simulation case to Petrel case workflow

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.

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.

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.

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.

Reservoir Engineering for Non-Reservoir Engineers

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

AUDIENCE

This course is designed for those individuals whose background is not reservoir engineering.

PREREQUISITE

A technical degree.

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.

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.

Initializing simulation models

Skill – 1 Days

Initializing Simulation Models course is a VILT (virtual instructor led training) course

delivered in real time. The coursed is designed for 4 hour sessions over a day period and is delivered using WebEx platform. The course content is structured to incorporate passive and active learning approaches to achieve unrivaled virtual training experience. It always a good practice to properly set the initial reservoir conditions, before simulating the dynamic behavior of the reservoir.

COURSE CONTENT

- Initialization, Enumeration, Equilibration
- Fine grid equilibration, Simulation grid QC
- Stability test, Scaling of saturation end points
- Scaling of end point relative permeabilities and capillary pressures
- J-function, SWATINIT
- Volume reporting in ECLIPSE
- Reconciliation between static and dynamics Volume calculation

AUDIENCE

Reservoir Engineers involved in reservoir appraisal and field development projects.

PREREQUISITE

Attendees must have attended ECLIPSE simulation course or Petrel Reservoir Engineering course.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

Well and Group Control techniques in Reservoir Simulation

Skill – 1 Day

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.

COURSE CONTENT

- Well Controls, Well targets and limits, Economic limits
- Group Production Strategies, Guide Rate strategy
- Workovers and interventions, 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.

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 .

DOMAIN | SOFTWARE | VIRTUAL CLASSROOM

Well Planning & Design	Drilling Technology	Management & Well Operations	COMPETENCY LEVEL
		Deepwater Well Project and Risk Management	ADVANCED
Advanced Petroleum Geomechanics	Dynamic Pressure Drilling	IWCF Surface Well Control Certification (Supervisors) Level 3&4	
		HPHT Drilling Design and Operations	
		IWCF Well Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training	
Well Abandonment - Plug, Abandonment and Decommissioning	Practical Directional Drilling and Surveying		SKILL
Cement Integrity Assurance and Evaluation	Horizontal, Extended Reach, and Multilateral Drilling		
Well Design and Construction Engineering - Heriot-Watt University Program			
Drillstring Design	Mud School - European Learning Center		
Cementing Operations	Deepwater Completions	Stuck Pipe Prevention	
Casing Design		Managing Drilling Operations (with Drilling Simulator)	
Practical Cementing		Mud Logging: Surface Gas Measurement and Fluid Characterization	
Practical Cementing Operations		Drilling Optimization	
Well Architecture and Drilling in Shale Plays		Deepwater Drilling Design and Operations	
Advanced Remedial Cementing (Russian)		Well Integrity - Life of a Well	
		Drilling Project and Risk Management	
		Stuck Pipe and Fishing Operations	
		Stuck Pipe and Hole Cleaning	
Directional Drilling and Surveying			FOUNDATION
Fundamentals of Petroleum Geomechanics	Drill Bits and Hydraulics	Well Control	
Fundamentals of Cementing Operations		Well Placement Fundamentals	
Basic Cementing (Russian)		Introduction to Deepwater Rig Operations	
Geomechanics for Drilling		Drilling Fluids	
Deepwater Familiarization		Petrophysics for Drilling Engineers	
		Mud Logging Operations	
Drilling Engineering			
Rig Awareness and Familiarization			AWARENESS
Introduction to Drilling			

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | **SOFTWARE** | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Petrel	Drillbench	Techlog
SKILL	Petrel Well Design	Drillbench Blowout Control	Techlog for Drilling Performance Analysis
			Techlog Wellbore Integrity VILT
	Petrel Reservoir Geomechanics		Techlog Wellbore Integrity Evaluation
FOUNDATION		Drillbench Dynamic Well Control Modeling	Studio for Techlog Users
		Drillbench Dynamic Hydraulics and Temperature Modeling	
		Wellflo Underbalanced Hydraulics Modeling	

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 .

DOMAIN | SOFTWARE | **VIRTUAL CLASSROOM**

COMPETENCY LEVEL	Management & Well Operations	Techlog
SKILL	Stuck Pipe and Hole Cleaning	Techlog Wellbore Integrity VILT
FOUNDATION	Deepwater Design and Operations Familiarisation	

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.

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
- Reservoir concerns for directional well design
- Drilling and surface considerations
- Horizontal wells: Types and planning
- Logging, coring, and completion techniques
- Wellbore-stability issues and hole cleaning

AUDIENCE

Drilling engineers, drilling supervisors, trainee drillers, rig engineers, and service company personnel with basic drilling engineering.

PREREQUISITE

1 to 3 years of field experience with drilling operations and basic math skills.

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
- Wellbore instability
- Mechanical earth model construction, operational aspects of wellbore stability control
- Sand production and prediction

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.

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
- 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.

Fundamentals of Cementing Operations

Foundation – 5 Days

This 5-day course is designed increase the participants' knowledge of well cementing services and help them understand service 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 slurry design
- Cement slurry selection
- Gas migration
- Cement equipment, plug placement, and software
- Cementing equipment
- Software demonstration
- Cement evaluation and cement job practical
- Cement job design and execution
- Rig site cement job practical
- Specialized and new technology cement systems
- Introduction to deepwater cementing
- Roundtable and course close

AUDIENCE

Engineers or field supervisors with limited or no experience in cementing 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.

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 wellbores.

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 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
- Discussion and question-and-answer session
- Group projects: cementing design and evaluation exercises
- Group Discussion
- Examination
- End of course recap and participant feedback

AUDIENCE

Drilling, completion, and production engineers and others interested in the basic concepts of primary cementing, cement evaluation, and squeeze cementing.

PREREQUISITE

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.

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.

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
- 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
- Emerging technologies
- Waste management
- Loss control measure and troubleshooting
- Course review and wrap up

AUDIENCE

Drilling engineers wanting a better understanding of drilling fluids and their use.

PREREQUISITE

Working knowledge of drilling practices and concepts.

Deepwater Familiarization

Foundation – 4 days

This four-day course provides overall awareness, at a foundation level, of deepwater wells, including the deepwater geological environment, metocean setting, well design concerns, rig selection, and an overview of well drilling operations in deepwater. Presentations, Videos, and Exercises will be used to support learning

COURSE CONTENT

- Introduction to Deepwater
- Introduction, Challenges of Deepwater: an introduction to the deepwater setting, and the main challenges associated with wells drilled in deepwater.
- Deepwater Metocean Environment and Rig Selection
- Station Keeping: Mooring and dynamic positioning systems and their pros and cons.
- Well operations in deepwater,
- Open Water Operations: operations conducted prior to setting BOPs
- Shallow Hazards: the hazards faced prior to having well shut-in capability
- Rig Equipment, Well Control, and Additional Considerations
- BOP Systems & Drilling Riser: BOP selection and operations in deepwater

AUDIENCE

This course is designed as an entry to deepwater wells for drilling and completions engineers, technicians, and administrative staff who will be involved in the planning and/or execution of deepwater wells.

PREREQUISITE

The course assumes that participants are aware of the basic principles of drilling and completions and have some exposure to offshore wells.

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 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.

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
- 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

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. Also this 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.

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

Drilling knowledge and basic geological knowledge.

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, drillbit 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
- 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.

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

- 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 . . .
- Laboratory Visit: Houston Cementing Technology Center (CTC)—Cementing Client Support Lab (CSL) (or similar facility if not in Houston)
- Well-Abandonment Legislation, Regulations and Guidelines; Comparison of P&A Requirements.

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.

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
- Drillstring 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
- 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
- Downhole equipment: Drilling tools, drilling motors, drill bits, and deflection methods
- 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 engineers, drilling supervisors, trainee directional drillers, rig engineers, asset exploitation teams, and service company personnel.

PREREQUISITE

Experience in basic drilling engineering and wellsite operations, and exposure to directional drilling operations; attendees are required to bring a simple scientific calculator for in-class exercises.

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.

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

AUDIENCE

Trainee drilling engineers, petroleum engineers, and specialist service company engineers.

PREREQUISITE

Drilling operations experience.

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
- Wellbore stability
- 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 Perfomance 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
- 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
- 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
- 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
- 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 wellsite 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.

Deepwater Completions

Skill – 5 Days

This course provides understanding of the key drivers and challenges in deepwater completions, including an awareness of deepwater geological environment, metocean setting, well design issues, rig selection, and well operations. An overview of risk management provides insight into deepwater risks and how they are managed.

COURSE CONTENT

- Introduction to Deepwater Completions
- Deepwater well planning and construction
- Well Design
- Deepwater MODUs, platforms, and intervention units; rig equipment, well control
- Landing Strings, Risk Management, & Final Exercise

AUDIENCE

Field Completion Engineers, Completion Supervisors, Coordinators who Supervise completions, Drilling and Well Engineers, Wellsite Leaders who may supervise deepwater completions installation.

PREREQUISITE

The course assumes that participants are familiar with shallow water completions and general aspects of well operations in shallow water.

Stuck Pipe Prevention

Skill – 4 Days

This course provides an detailed overview of stuck pipe prevention - the causes of stuck pipe and the techniques to avoid and recover from stuck 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
- Importance of Prevention
- Stuck Pipe Causes and Mechanisms
- Stuck Pipe Freeing Mechanisms
- Rig Site Warnings
- Mechanical Sticking Prevention Measures
- Group Exercise
- Group Exercise Review
- Solids Induced Pack-off Prevention Measures
- Differential Sticking
- Wellbore stability
- Group Exercise Review
- ECD Management
- Hole Condition Monitoring
- Connection Practices
- Group Exercise
- Stuck Pipe Case Histories
- Tripping & Backreaming Practices

AUDIENCE

Drilling Supervisors, Drilling, Petroleum and Completion Engineers, Drillers, Directional Drillers and specialist service company engineers. Management personnel will benefit from learning about the practical aspects of drillstring recovery and the decision making processes.

PREREQUISITE

Awareness and/or Foundation knowledge of drilling operations, drillstring design and drilling fluids.

Casing Design

Skill – 5 Days

This course focuses on casing design from an engineering and operational perspective. Attendees are provided with design rules for a wide range of straightforward and hostile environments and also examine the nomenclature of casing design, manufacturing processes, materials, and properties. In addition, attendees review design policies and procedures; the theory of burst, collapse, and axial loadings; the theory and limitations of API specifications and connections; and special cases such as high pressure high temperature (HPHT) and sour environments.

COURSE CONTENT

- Material properties
- API ratings and formulas
- Steel testing and triaxial loading
- Design concepts and casing design rules
- Factors affecting tubular strength
- Buckling and connections
- Casing setting depth determination
- Service life models
- Thermal and bending load determination and load cases
- Load design for burst, collapse, and axial loads

AUDIENCE

Drilling engineers, drilling supervisors, trainee drillers, rig engineers, and service company personnel with basic drilling engineering knowledge.

PREREQUISITE

Understanding of wellbore geometry and the basics of mechanical concepts, and basic math skills; participants are required to bring a scientific calculator to complete the in-course exercises.

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 additives play in cement system design. 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.

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
- Cement job evaluation
  - Cement bond logs
  - Cement evaluation log interpretation
  - Cement bond log workshop
  - Plug and squeeze cementing calculations
  - New technologies in cementing (demonstrations)

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 occuring 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

AUDIENCE

Wellsite geologists and operation geologists.

PREREQUISITE

Mud Logging Operations course, or a respectable understanding of mud logging.

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
- 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
- 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.

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.

COURSE CONTENT

- Drilling units
- Drilling equipment specific to deepwater drilling
- Pore pressure and fracture pressure window
- Well control
- Riser selection
- 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
- Cement bond log evaluation techniques
- Remedial: applications, techniques, downhole tools, program design, coiled tubing
- Advanced remedial cementing technologies: CemCRETE technology, SqueezeCRETE cementing solution specifically designed for low-injectivity wells
- Specifications of cement slurry system laboratory analyses: description of API laboratory equipment, API laboratory analysis procedures, remedial slurry analyses, and remedial cementing system design
- Remedial cementing equipment: pumping units, slurry blending and mixing systems, cementing manifold
- Training exercise using cementing unit simulator
- Round table discussion

AUDIENCE

Production, drilling, and completion engineers and other oilfield technical staff with a need for better understanding of how to mitigate water production in an oil or gas well using remedial cementing techniques.

PREREQUISITE

Basic knowledge of drilling and completion operations.

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.

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
- Project closeout
- Management systems, risk management, and risk management levels
- Health, safety, environment, and quality (HSEQ) management systems
- Operational risk assessments and analysis

AUDIENCE

Drilling program managers, project managers, and others with direct involvement in the planning of drilling operations.

PREREQUISITE

Introduction to Drilling Engineering course or equivalent work experience in drilling engineering or management.

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.

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
- Wellbore stability and causes of instability
- Lost circulation and its causes
- Economics of hole recovery efforts
- Drilling fluid types, selection, and fluids management
- 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.

Deepwater Well Project and Risk Management

Advanced – 5 Days

The key objectives for this course are to highlight the critical project and risk management issues involved in a deepwater well project to achieve the project mission: delivering value safely, responsibly and efficiently. At the end of the course, participants will understand the key issues and principles in deepwater project management, they will develop an understanding of the challenges, choices, and compromises necessary to drill deepwater wells.

COURSE CONTENT

- Deepwater Well Project and Risk Management Principles
- Deepwater challenges: how the deepwater setting offers challenges different from wells onshore or in shallow water.
- Cost vs value: ensures that the differences between price, cost, and value are understood
- The project plan: clarity on mission, objectives, and value
- Time and cost estimation: understanding and reflecting uncertainty in realistic estimates
- Management of Change: the challenge of ensuring value – decisions not decision trees
- Contracting: selecting the right contracting approach for different services and materials
- Well PM software and Key Performance Indicators (KPIs): monitoring the project using value-focussed KPIs; discussion of PM software, management reports, continuous improvement, benchmarking, technical limit, and KPIs
- Task progress and phase close out: ensuring early identification of potential differences in outturn time or cost to permit value-based decisions
- Well planning - Pre-drill data requirements: the site survey and shallow hazard analysis, and how this sets the stage for success

- Contingency plans: ensuring that these are complete and meaningful
- Emergency response: how this fourth element of process safety is assured.
- Operations management: applying decision-making, technical limit, communications, in the Execute Stage of the project.
- Project success factors: sources of value, development skills, key factors in successful projects
- Situational awareness,
- Decision-making
- Competence

AUDIENCE

Wells Managers, Wells Team Leaders, Drilling managers, Well Operations superintendents, Senior well engineers, Well Engineers, Wellsite leaders and supervisors involved in deepwater well projects.

PREREQUISITE

Deepwater well project management requires an understanding of differences between conventional well projects and deepwater well projects. Participants should be understand conventional well design, well construction operations, and support functions in order to grasp the concepts and challenges faced in the deepwater environment.

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
- 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 (Supervisors) Level 3 & 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

- 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
- Gas behavior in Water Based Mud (WBM)
- Convention and unconventional well control procedures
- Well control complications
- Gas behaviors in Oil Based Muds (OBM)
- Review and selection of equipment
- Equipment installation and testing
- IWCF practical assessment with simulator
- Self-study to prepare for written examinations
- Group study
- Principles and procedures
- Surface well equipment

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.

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
- 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
- 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
- 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)
- Equipment1 – Completion Equipment
- Class Exercise1 – Completion Equipment
- P&P1 – Pressure Control Management
- Class Exercise2 – Pressure Control Management
- P&P2 – Barrier Principles
- P&P3 – Well Information
- P&P4 – Shut-in Procedures
- P&P5 – Pressure Control Methods
- P&P6 – Problems
- Class Exercise3 – Barrier Principles, Well Information, Shut-in Procedures, Pressure Control Methods and Problems
- Equipment2 – Wireline Equipment
- Class Exercise4 – Wireline Equipment
- Equipment3 – Coiled Tubing Equipment
- Class Exercise5 – Coiled Tubing Equipment
- Equipment4 – Hydraulic Workover (Snubbing) Equipment
- Class Exercise6 – Hydraulic Workover (Snubbing)Equipment
- WCF Assessment – Completion Equipment
- IWCF Assessment – Principles & Procedures
- IWCF Assessment – Wireline Equipment
- IWCF Assessment – Coiled Tubing Equipment
- IWCF Assessment – Hydraulic Workover (Snubbing) Equipment

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.

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
- Advanced software options
- Advanced software features: Managed pressure drilling and well control simulations

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.

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer, Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists and Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

Drillbench Dynamic Hydraulics and Temperature Modeling

Foundation – 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

- Well Control Overview
- Kick Circulations
- Kick Tolerance Calculations
- Single Bubble vs Dynamic Models
- User interface
- Help Screens
- Data input
- Interactive simulations
- Expert Input Data

- Managed Pressure Drilling
- Batch Simulations
- Kick tolerance calculations

AUDIENCE

Drilling Engineers and Drilling Supervisors requiring a better and a more detailed understanding of potential well control issues.

PREREQUISITE

Comprehension and understanding of well control principles is required to understand the input and output requirements of the software.

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 power point slides and individual hands-on exercises to show the participants the use of the software. At the end of the course, the participants should be able to enter the required well data and run simulations using the software.

COURSE CONTENT

- Heat Transfer
- Operating Windows
- Bottom Hole Pressures
- Equivalent Liquid Flow
- Hole Cleaning
- Expert Input Data
- Operating Windows
- Reservoir inflow performance

AUDIENCE

Drilling and Fluid (mud) Engineers planning underbalanced, or air or foam drilling operations.

PREREQUISITE

Comprehension and understanding of well design and hydraulics is required to understand the input and output requirements of the software.

Petrel Well Design

Skill – 2 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
- Trajectory uncertainty; Driller's target;
- Import offset well data using indexed EDM files;
- Import drilling events;
- create drilling risk and manage risks;
- Making scaled map view for well plan;
- Generate vertical section for plan;

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.

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.

Techlog for Drilling Performance Analysis

Skill – 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 multiwell 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.

COURSE CONTENT

- Introduction: project structure and managing data
- Displaying data
- 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.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

Petrel Reservoir Geomechanics

Skill –3 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.

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.

Techlog Wellbore 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. The course takes you through the steps of data preparation and pre-processing, data visualization and QC, and to interpretation of the log data to assess the condition of the wellbore. The Techlog built-in workflows allow you to evaluate the integrity of the downlhole tubulars and the condition of the annular space to enable informed decision making.

COURSE CONTENT

Petrophysists, Drilling engineers, Borehole production engineers.

PREREQUISITE

Techlog knowledge.

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

- Deepwater Well Control
- Drilling Challenges
- Shallow Hazards / Hydrates
- Subsalt
- New Technology; Dual Gradient Drilling, MPD
- Completions & Interventions
- Operations Management

AUDIENCE

Internal course for Deepwater business.

PREREQUISITE

Basic knowledge of the Oil Industry.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

Stuck Pipe and Hole Cleaning

Skill – 3 Days

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 high angle wells and general practices
- Hole conditions monitoring; surface drilling parameters, Torque and Drag, Annular Pressure While Drilling and integration of measurements
- 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.

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.

DOMAIN | SOFTWARE | VIRTUAL CLASSROOM

Artificial Lift	Well Intervention	Well Performance	Well Completions	COMPETENCY LEVEL
			Fracturing Pressure Analysis (5 days)	SPECIALIZED
Electric Submersible Pumps - Advanced	Matrix Stimulation Engineering	Shale Plays Production - Exploiting Production Sweet Spots	Fracturing Shales	ADVANCED
	Matrix Stimulation in Carbonates	Advanced Well Testing Operations - ELC	Fracturing Pressure Analysis	
		Advanced Production Data Analysis and Nodal Analysis	Frac Packing Course	
		Integral Well Productivity		
		Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane		
		Production Data Analysis - Shale Gas		
Advanced Gas Lift Design & Troubleshooting	Coiled Tubing Applications	Well Productivity and Enhancement	Hydraulic Fracture Treatment Design and Quality Control	SKILL
High Gas-Oil Ratio Well Liquid Unloading	Formation Damage and Mitigation		Completions and Production Engineering	
Introduction to High Temperature ESP Applications	Workovers and Completions	Gas Well Productivity	Subsea Completions	
Electric Submersible Pumps - Aplication Engineering - Simulator	Acid Stimulation Techniques	Water Management Aspects of Shale Plays	Sand Control	
Design, Diagnosis and Optimization of Gas Lift Systems	Fishing, Perforating and other Slickline Applications	Production Engineering Aspects of Shale Plays	Microseismic Imaging and Hydraulic Fracturing	
Sucker Rod Pumps - Application Engineering	Advances in Coiled Tubing (Spanish)	Fundamentals of Well Testing Operations - ELC	Completions and Stimulation Aspects of Shale Plays	
Electric Submersible Pumps - Application Engineering - Practical Training	Advanced Slickline Operations	Production Technology - Heriot-Watt University Program	Well Integrity - Cement Placement Evaluation	
Continuous Gas Lift - Design, Diagnosis and Optimization	Acidizing Sandstones and Carbonates	Modern Production Logging		
	Perforating	Advanced Nodal Analysis for Production Engineers	Perforating	
		Oilfield Water Management	Practical Completions and Production Engineering	
		Subsurface Surface Production Optimiz		
Integrated Production and Well Operations Modeling		Introduction to Reservoir Engineering and Nodal Analysis	Hydraulic Fracturing	FOUNDATION
Artificial Lift Technology	Well Stimulation	Introduction to Cased-Hole Data Acquisition and Interpretati	Completion Fluids for Well Supervisors	
Progressive Cavity Pumps - Application Engineering			Introduction to Sand Control	
	Acidizing and Fracturing		Introduction to Well Completions	
	Introduction to Coiled Tubing Operations		Practical Hydraulic Fracturing	
	Introduction to Completions and Well Interventions		Practical Perforating I: Shaped-Charges, Guns and Operations	
			Practical Well Completions: Downhole Tools and Basic Systems	
	Fundamentals of Slickline Operations		Introduction to Cased-Hole Evaluations	
	Understanding Common Well Intervention Techniques		Introduction to Intelligent Completions Workshop	
			Fundamentals of Well Completions	
Introduction to Production Engineering				

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | **SOFTWARE** | VIRTUAL CLASSROOM

COMPETENCY LEVEL	OFM	OLGA	PIPESIM	Avocet	Petrel	Integrated Asset Modeler	Techlog
ADVANCED	OFM Reservoir Optimization	OLGA Advanced Flow Assurance					
	OFM Waterflood Monitoring and Surveillance	OLGA Process Equipment Workshop		Avocet Administration II			
		OLGA Heat Transfer Workshop					
		OLGA Fluid Handling Workshop					
SKILL							Techlog Wellbore Integrity VILT
	OFM Intermediate Using Gas Operations Examples	OLGA Well Dynamics	PIPESIM Advanced Well Modeling	Avocet Administration I	Petrel Production Data Interpretation and Forecasting	Integrated Asset Modeler Fundamentals	
	OFM Intermediate Using Oil Operations Examples	PVT For Flow Assurance and Production Engineering Applications	PIPESIM Gas Field Production Operation	Avocet Mobile Data Capture			
FOUNDATION		OLGA Flow Assurance (3 days)	PIPESIM Fundamentals	Avocet Fundamentals			
	OFM Fundamentals	OLGA Flow Assurance (5 days)	PIPESIM Surface Facility				
	OFM Fundamentals Using Canada Data Sources						
	OFM Administration						
	OFM Fundamentals Using Gas Operations Examples						
	OFM Fundamentals Using Oil Production Examples						
AWARENESS	OFM Analysis Dashboard						

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 .

DOMAIN | SOFTWARE | **VIRTUAL CLASSROOM**

COMPETENCY LEVEL	Artificial Lift	Well Performance & Completions	Techlog
SKILL			Techlog Wellbore Integrity VILT
FOUNDATION	Artificial Lift Methods	Integrated Production Optimization	

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 si mulate 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.

Introduction to Reservoir Engineering and Nodal Analysis

Foundation – 5 Days

The course discusses basic concepts of Reservoir Engineering and introduces Nodal analysis. The course starts with a description of Reservoir Rock and Reservoir Fluids, followed by an explanation of Inflow and Outflow perfromance. Exercises are performed in the class to explain the impact of different variables in well production and production optimization process. This course is a very good introduction to Production Engineering Programs.

COURSE CONTENT

- First Day Quiz
- Geology and Production
- Rock Properties
- Fluid Properties
- Five Reservoir Fluids
- Darcy's Law
- Fluids Statics and Fluids Distribution
- Reserves
- Nodal Analysis
- Inflow Performance - Oil Wells
- Inflow Performance - Gas Wells
- Damage ans Skin
- Optimization using Nodal Analysis
- Exercises

AUDIENCE

The course is designed for fresh-outs in O&G industry.

PREREQUISITE

Degree on Engineering or Science.

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
- 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.

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

AUDIENCE

Anyone involved with well surveillance, maximizing recovery, or identifying production problems in artificially lifted wells.

PREREQUISITE

None.

Well Stimulation

Foundation – 5 Days

This is a practical 5-days course to be delivered in MLC. The course includes revision of theory on Matrix Acidizing and on Hydraulic Fracturing, and practical classes on laboratory procedures and operational procedures, utilising pumping and mixing pads, for familiarization with the supervision of operations at well site.

COURSE CONTENT

- Welcome
- 1st Day Quiz
- Purpose of Stimulation (Matrix and Fracturing)
- Discussion on Formation Damage
- Purpose of Fracturing
- Basic Geomechanics and Fracturing Models
- Fracturing Fluids and Proppants
- Fracturing Schedules
- Laboratory procedures for Matrix Acidizing
- Acid solubility tests
- Lab tests for compatibility of Oil and Acids
- Rig-up
- Practicing with pumping units and blender
- Rig-down
- New technology in Acidizing and Fracturing
- Last day quiz

AUDIENCE

Professionals requiring basic training on the Supervision of Acidizing and Fracturing interventions.

PREREQUISITE

Basic understanding of well completions and architecture, and basic concepts of geoscience. Before this course, Participants have already passed in classes where these concepts have been discussed.

Introduction to Cased-Hole Data Acquisition and Interpretation

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
- 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.
- 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.

AUDIENCE

This class is open to all technical domains in the oil and gas industry. No prior cased hole experience is necessary.

PREREQUISITE

No prior cased hole logging experience is necessary.

Completion Fluids for Well Supervisors

Foundation – 3 Days

The objective of the course is to familiarize the audience with completion fluids, density control, fluid-loss control and filtration. Safety and environmental concerns are included.

COURSE CONTENT

- Afternoon - Completion and workover fluids, types of completions and workover fluids
- Density control, brine safety and environmental concerns, products
- Displacement, filtration

AUDIENCE

Drilling and Completion personnel, well supervisors, and any other personnel directly involved with well interventions.

PREREQUISITE

Basic knowledge of oilfield operations.

Progressive Cavity Pumps - Application Engineering

Foundation – 5 Days

The Progressing Cavity Pumping System (PCP) is considered the faster growing artificial lift method in the last two decades. Its applications cover very low

downhole pressure wells, solids handling and viscous oils. Actually the PCP companies have improved the reliability of the whole system including new elastomers development, better gas separation and optimization using surface controller. Because its minimum initial cost and operational flexibility, this is very suitable solution for heavy oil fields development.

COURSE CONTENT

- Introduction, Review of Artificial Lift Systems and PCP Equipment Capabilities, Well Inflow Performance Relationships, Practical Exercises.
- Application Principles, Advantages and Limitations, Description of Surface and Equipment: Motors, Wellhead Drive Unit, Variable Speed Drive, Stuffing Box.
- Description of Subsurface Equipment: Rod Guides / Centralizers, Sucker Rod Handling Tools, Tubing Drain, Pump, Tag Bar / Rotor Stop, Gas Separator, Torque Anchor / No-Turn Tool, Downhole Sensor.
- Design of PCP Systems. Exercises.
- Analysis of Progressive Cavity Pumping System.

AUDIENCE

Production Engineers, technologists, people who are involved in Production Optimization.

PREREQUISITE

Students should be familiar with basic Production Engineering, have some field experience in Production and basic knowledge of artificial lift systems.

Introduction to Sand Control

Foundation – 3 Days

The course familiarizes the Participants with the factors for sand production and prevention methods, with emphasis on Gravel Pack. At the end of the course, Attendants can participate in technical projects related to sand production and gravel packing operations.

COURSE CONTENT

- Welcome
- 1st day Quiz
- Introduction to Sand Control
- Geology for Sand Control
- Geomechanics
- Methods for Sand Control
- In-Situ Consolidation
- Gravel Pack Design
- Gravel Pack (cont.)
- Vent Screens
- Last day Quiz

AUDIENCE

The course is addressed to Petroleum, Reservoir, Drilling, Production and Completion Engineers or to Geoscientists. It is required a basic knowledge of Reservoir Engineering and upstream disciplines.

PREREQUISITE

It is required a basic knowledge of Reservoir Engineering and upstream disciplines.

Acidizing and Fracturing

Foundation – 5 Days

This course is an introduction to general Well Stimulation focusing Matrix Acidizing and Hydraulic Fracturing Design Methodologies and Quality Control Processes at Basic level. Formation Damage mechanisms are discussed as an introduction to Acidzing. Hydraulic Fracturing is presented as a process to increase productivity of wells in tight formations. Both methods are explained in sandstones and carbonates formations and numerous exercises are included to facilitate the comprehension of concepts and their practical application.

COURSE CONTENT

- Introduction
- 1st Day Quiz
- Formation Damage
- Sandstone Acidizing Fluids Chemistry
- Sandstone Acidizing Fluids Selection
- Carbonate Acidizing
- Sandstone Job Design
- Carbonate Job Design
- Overview of Fracture Treatments
- Selection of Candidates
- Geomechanics I
- Geomechanics II
- Hydraulic Fracturing Models
- Near Wellbore Geometry
- Fracturing FLuids
- Frac fluids leak-off
- Production Prediction
- Refracturing
- Acid Fracturing
- Perforating Requirements

AUDIENCE

Fresh-out Production and Reservoir Engineers and Geoscientists needing to deal with the Candidate Selection and Design of Acidizing and Fracturing Operations.

PREREQUISITE

Degree in an Engineering or Geoscience discipline. Basic knowledge of Petroleum Industry and Well Intervention.

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.
- Casing suspension.
- Tubing selection.
- Tubing design.
- Tubing connections.
- Upper completion accessories.
- Safety valves.
- Artificial Lift.
- Multilaterals.
- Sand Control.
- Intelligent completions.

AUDIENCE

The course is designed for fresh-outs.

PREREQUISITE

This course is for fresh-outs, however it is recommended that the attendants have been through courses of basic reservoir engineering, geology and drilling engineering.

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
- 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 fundaments 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

AUDIENCE

Completion engineers, frac managers, supply chain managers, commercial representatives, and other professionals dealing with fracturing operations.

PREREQUISITE

General knowledge of oil and gas well operations and exposure to fracturing operations and general production and interventions disciplines (beneficial).

Introduction to Completions and Well Interventions

Foundation – 12 Days

This extended course (12days) is intended to provide new completions and well intervention engineers and supervisors with a broad overview of all aspects of completions and well interventions operations planning and monitoring.

COURSE CONTENT

- Types of Well Completions
- Tubing & Tubing Connections
- Packers
- Primary Cementing
- Remedial Cementing
- Cement bond logs
- Perforating
- Well Control
- Sand Control Completions
- Sand Management
- Multilateral Completions
- Smart Completions
- Slim Well Repairs
- CT Completions
- Introduction to Well Integrity
- Horizontal Well Completions
- Horizontal Well Performance
- Formation Damage Mechanisms
- Candidate Selection for Acidizing
- Fracturing Treatment Objectives
- Hydraulic Fracturing Models
- High Pressure Jetting
- Fill Clean-Outs
- Overview of Artificial Lift Systems
- Electric Submersible Pumps
- Rod Pumps

AUDIENCE

Fresh-out Production, Drilling, Completion Engineers and other professionals involved in Well Intervention projects.

PREREQUISITE

Basic knowledge and field exposure to well 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.

Practical Well Completions: Downhole Tools and Basic Systems

Foundation – 2 Days

This 2-day practical course introduces well-completion concepts and downhole tools. It familiarizes attendees with subsurface equipment, tools, procedures, and processes, including the basics of shaped-charge manufacturing and oilwell perforating, sandface completions, and artificial-lift technologies. The agenda comprises lecture presentations, videos and animations, and a Houston-area Field trip.

COURSE CONTENT

- Well-completions overview
- Multilateral wells and wellbore junction systems
- Liner hanger systems
- Packers: cased hole and openhole
- Bridge plugs and tubular accessories
- Passive inflow control device (ICD) concept
- Sand control, screens, and sandface completions
- Multistage stimulation equipment
- Barrier, or isolation, valves
- Subsurface safety valves
- Permanent downhole flow-control valves
- Intelligent completions for monitoring and control
- Artificial lift: gas lift and electrical submersible pumps
- Visit to Schlumberger manufacturing and engineering facilities to view equipment displays, models, and demonstrations.

AUDIENCE

Oil and gas well professionals with a need to learn basic concepts of well completions.

PREREQUISITE

Basic knowledge of oil and gas well drilling and operations.

Fundamentals of Slickline Operations

Foundation – 5 Days

The course will consist of a few theoretical sessions in the classroom with experienced professionals providing presentations of the tools and operations; the participants will also have various practical exposure sessions using the Slickline well/pad and having hands on sessions using the 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.

COURSE CONTENT

- History of Slickline
- Well Completion - Theory
- Slickline Units and Powerpacks (Zones) - Theory
- Weight and Depth indicators - Theory
- The Wire (Type -Tests - Log Books) - Theory
- Pressure Control Equipment (What must be controlled) - Theory
- Running and Pulling Tools - Theory
- Locks, Standing Valves and Landing Nipples - Theory
- Baker / Otis / Camco/ PCE Flow Control Equipment - Theory
- Wire Testing practicals
- Pressure control equipment - Practical
- Shifting tools - Practical
- Open/close SSD on simulator
- Rig-up Slickline (Open Hole)
- RIH Set and Retrive FB-2 Baker 2.75" - Jar - Practical.
- QUIZ (Basic Slickline Training Course)
- Quizz – Quiz Review
- Oilfield Calculations.
- SENSA LINE (Optical)-Introduction / DSL-Introduction.

AUDIENCE

Technicians, supervisors or engineers with little or no prior knowledge of slickline.

PREREQUISITE

Familiar with basic well completions and general well intervention operations.

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
- 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).
- Special application tools: Phase Velocity Log, Water Flow Log, Noise Log, Tracer Ejector Log.
- 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.

Understanding Common Well Intervention Techniques

Foundation – 5 Days

A course meant to prepare beginner Well Intervention Engineers in the most common field operational techniques performed to address typical well situations that jeopardize the intended well's productivity or its physical integrity.

COURSE CONTENT

- Well Integrity
- Treating and Pumping Equipment
- The Wellhead
- Cementing, Coiled Tubing and Nitrogen Operations
- Cementing the Pay Zone for Well Interventions
- CT Equipment and Fill Clean-up
- Formation Damage and Stimulations
- Main types of Formation Damage
- Acidizing Overview (Sandstone or Carbonate)
- Slickline Operations
- Slickline Operations and Tools
- Fishing
- Water Control
- Diagnostic Plots for Water Control
- Logging Tools for Water Control

AUDIENCE

The course was developed for Lagoon Oil fresh-out engineers but can be delivered to any other clients.

PREREQUISITE

General knowledge of oil & gas industry and well operations.

Introduction to Intelligent Completions Workshop

Foundation – 5 Days

The first two days consist in the presentation of benefits and limitations of IC, different types of IC and discusion of IntelliZone Compact (Schlumberger technology). During the following three days, Participants, using reservoir and well completions data previously collected, will exercise the optimization of well completions using the concepts learnt in first two days. Participants will be divided in groups of 2 or 3 elements each and will compete to develop the best completion design. During the last day, the groups present their proposals to Management and the instructor.

COURSE CONTENT

- Introduction to Intelligent Completions
- Typical Applications
- Downhole Sensors and Fibre Optic
- Downhole tools
- Passive versus Active Control
- New Technology (Smaller, compact systems)
- Gathering information and data on multi-zone existing wells (geological, drilling, reservoir, production and completion data) and existing problems and limitations.
- Selection of fields candidates to implementation of IC. Summary of benefits and limitations. Draft of proposed completions.
- Presentation to Management and discussion.

AUDIENCE

Participants of Production Engineering Training program.

PREREQUISITE

General knowledge of Well Completions, Downhole Production Equipment and Well Architectures (Vertical, Horizontal and Multi-Lateral Wells). General knowledge of Well Performance, Formation Damage and Nodal Analysis.

Fundamentals of 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. Stress Analysis in completion tubulars is explained applying numerous exercises. 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.
- Wellheads.
- Casing suspension.
- Tubing selection.
- Tubing design.
- Safety valves.
- Multilaterals.
- Sand Control.
- Intelligent completions.
- Use of slickline equipment during well completion.
- Stress analysis in tubulars.
- Last Day Quiz

AUDIENCE

The course is designed for fresh-outs and for professionals in need to work with well completions (drilling staff, production and reservoir engineers).

PREREQUISITE

None.

Introduction to Production Engineering

Foundation – 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
- 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.

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

AUDIENCE

Production engineers, managers, and production technicians (office and fields) who have experience with artificial lift and gas lift systems.

PREREQUISITE

None.

Coiled Tubing Applications

Skill – 10 Days

This course covers basic and advanced Coiled Tubing. It includes a thorough discussion of coiled tubing equipment, the physical principles behind coiled tubing safety, principal applications of coiled tubing and pipe management. In the advanced course sessions, we will discuss CT application design, introduction to the CoilCADE software and workshop, and also the contingency plan for CT operations.

COURSE CONTENT

- Welcome
- Introduction to Schlumberger CTS
- CT Pipe Manufacturing
- Basic CT equipment
- Well Control equipment
- Basic CT Tools
- CT Pipe String Management
- Data Acquisition
- CTU and Simulator (visit depending on the tools available at the base)
- Introduction to CT Application
- Matrix Stimulation with CT
- Extended Reach Operations
- Introduction to Job Design
- Safety and Operational Standard
- Job Design – Risk Analysis
- Design Workshop
- Operations and Floaters
- CT and PC Equipment Overview
- CT String Overview
- Operational Modifiers
- CT Basic Operational Workflow
- Risk Analysis and Safety Standard
- CT Application Design: Fill/Scale removal
- CT Application Design: Hydraulic Fracturing
- CT Application Design: Milling Job
- Job Design Workshop
- Group Presentation & Discussion
- Wellsite Contingency Considerations
- New Technology in CT Operations

AUDIENCE

All personnel need to be familiar with Coiled Tubing Operations and the Application Design for different job activity.

PREREQUISITE

Basic knowledge of well completion and well intervention.

Well Productivity and Enhancement

Skill – 5 Days

This five day course will cover well performance and productivity. Specific topics that will be covered include, well inflow and outflow performance, NODAL analysis, well surveillance, and problem diagnostics. Participants will also learn about productivity enhancement by stimulation, work over, sand management, corrosion control, and artificial lifting.

COURSE CONTENT

- Well performance and productivity
- Reservoir types and performance
- Perforating and productivity

- Well productivity impairment
- Well inflow & outflow performance
- Well surveillance and problem well identification
- Production logging applications and techniques
- Electric and slickline surveys
- Sand production, control, and productivity effects
- Well intervention
- Matrix stimulation
- Hydraulic fracturing
- Well Intervention
- Presentation and discussion of Candidate Selection Exercise
- Tubing techniques and workover (Rig)
- Sand management
- Corrosion monitoring and control
- Artificial lift
- Electrical Submersible Pumps (ESP) and other systems
- Exercises on ESP systems

AUDIENCE

Reservoir and production engineers plus those involved in well performance evaluation and modeling.

PREREQUISITE

None.

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.

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.

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.

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

Geoscientists, engineers, and managers seeking a greater understanding of well completions and production performance.

PREREQUISITE

Minimum of 2 years of E&P experience in subsurface engineering, operations.

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 requires a reliable pumping system in high-temperature wellbores.

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.

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.

Gas Well Productivity

Skill – 5 Days

The course deals with fundamental concepts of gas well production engineering, gas well performance, gas well completions and gas well operations, supported by numerous exercises. At the end of the course, Participants wiil be able to participate in multi-disciplinary teams to analyse gas wells performance, select appropriate completions and decide operations in gas wells.

COURSE CONTENT

- Introduction
- 1st Day Quiz
- Inflow Performance
- Well Completion Methods (open hole, slotted liners, pre-perforated liners, screens)
- How and why gas and oil wells completions differ?
- Gravel Pack
- Drilling damage
- Production damage (fluids invasion, fines migration, scales, sanding)
- Perforate or stimulate
- Frac initiation
- Fracturing models
- Velocity string
- Plunger lift
- Compressors
- Multi-phase pumps

AUDIENCE

Production and Reservoir engineers and other professionals dealing with gas wells production concepts.

PREREQUISITE

General Production Enginering knowledge, preferably in gas wells.

Subsea Completions

Skill – 5 Days

- Introduction to subsea architecture
- Subsea completions
- Subsea completions
- Subsea wellheads
- Visit to the manufacturing plant
- Final quiz

AUDIENCE

Fresh-out Engineers and Technicians and other personel in need to learn the basics of subsea completion equipment and operations.

PREREQUISITE

Basic exposure to well completions in general, offshore drilling and operations.

Electric Submersible Pumps - Application Engineering - Simulator

Skill – 5 Days

The Electric Submersible Pump System (ESP) is considered an effective and economical means of lifting large volume of fluids from great depths under a variety of well conditions. Over the years, the ESP companies, in conjunction with the major oil companies, have gained considerable experience in producing high viscosity fluids, gassy wells, high temperature wells, etc. With this experience and improved technology, wells that were once considered non-feasible for submersibles are now being pumped economically.

COURSE CONTENT

- Introduction
- General Description of Pumps and Motors
- General Description of Cables
- Protectors and Monitoring
- Pump Selection and Dimensioning and Physical Limits
- Variable Speed Drive
- Gas Applications and Nodal Analysis
- Continuation of Nodal Analysis and Viscous Application
- Surface Equipment and Alternative Deployment
- Non Standard Applications

AUDIENCE

Production Engineers, technologists, people who are involved in Production Optimization. Specificaly people who want to gain more knowledge about ESP.

PREREQUISITE

The participants should be familiar with basic Production Engineering, have some field experience in Production, and have some Electric Submersible Pumps experience.

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
- 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.

Water Management Aspects of Shale Plays

Skill – 5 Days

Shale reservoirs are known to have low matrix permeability and hence gas production in commercial quantities requires fractures to provide permeability. Hydraulic fracturing is the commonly used technology to create extensive artificial fractures around well bores to enhance production. This process requires use of large amounts of water along with chemicals such as friction reducers, disinfectants, clay stabilizers, guar, cross-linking agents, surfactants, etc., in small amounts to facilitate the fracturing process. Some portion of the frac fluid and potentially connate water will return to the surface as produced water, potentially contaminated with frac fluid chemicals and heavy metals, radioactive material, and dissolved hydrocarbons from the formation.

COURSE CONTENT

- Produced water's history
- Produced water's history and Market Overview
- Water chemistry
- Lab work: Water Chemistry Analyses and lab instrumentation
- Frac Fluid Compatibility
- Water Quality by Shale Plays
- Lab work: Laboratory observations of various produced waters
- Water Transport and Storage
- Lab work: Particle size distribution demonstration, Turbidity analysis
- Water treatment process design
- Produced water treatment technologies
- Bacteria control
- Sample collection and preparation
- Inorganics
- Organics
- Bacteria
- Regulatory Framework and Air Emissions
- 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 will also benefit from attending this class.

PREREQUISITE

Engineering degree with 2-3 years of working experience in the Oil and Gas industry.

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.

Design, Diagnosis and Optimization of Gas Lift Systems

Skill – 5 Days

All facets of gas lift design and optimization are presented, including basic principles, equipment selection, gas lift types, and monitoring. Attendees will learn how to design and analyze continuous or intermittent gas lift systems for fast, safety-oriented solutions to increase or optimize oil production.

COURSE CONTENT

- Gas lift concepts, advantages, and disadvantages
- Gas lift surface and downhole equipment
- Valve mechanics: principles of operation and classification of gas lift valves
- Valve opening and closing forces and shop calibration
- Design of a continuous gas lift installation
- Nodal analysis, curve determination of minimum gradient, and gas static pressure gradient
- Mandrel spacing and selection of operating and discharge valves
- Overview of intermittent gas lift methods
- Design of an intermittent gas lift installation
- Conventional and unconventional methods: principle applications and advantages

AUDIENCE

Technical staff with basic knowledge of gas lift who are involved in the design, optimization, and monitoring of gas lift installations.

PREREQUISITE

Basic knowledge of well modeling and nodal analysis, and basic computer skills to complete in-class exercises.

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 lifttools and valves
- Subsurface safety valves
- Slickline hardware review
- Running plugs and safety valves
- Fishing tools
- Braided line and pressure equipment
- Downhole measurements and new developments

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.

Production Engineering Aspects of Shale Plays

Skill – 5 Days

This 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. Various practical methodologies for production data analysis will be covered, such as decline curve analysis, well testing, nodal analysis and production monitoring.

COURSE CONTENT

- Introduction to Production Fundamentals
- Production modeling
- Production Impairment
- Artificial Lift
- Production performance analysis of shale reservoirs

AUDIENCE

Engineers and Geoscientists interested in Shale Gas.

PREREQUISITE

None.

Microseismic Imaging and Hydraulic Fracturing

Skill – 5 Days

This course is a revision of main concepts of Hydraulic Fracturing in conventional formations, including tight sandstones, and the application of Microseismic Imaging to Fracturing Operations. The first three of this course overviews the main concepts of Hydraulic Fracturing and the last two days discuss Fracture Mapping through Microseismic. Hydraulic Fracturing is illustrated by numerous exercises to facilitate the understanding of the topics. In Microseismic, the theoretical background of acquisition, processing, and interpretation of the data will presented, focusing on practical considerations related to executing a successful imaging project.

COURSE CONTENT

- Overview of Fracturing Treatments
- Selection of Candidates
- Fracturing Treatment Objectives
- Geomechanics
- Microfrac and SRT
- Fracturing Fluids
- Frac Fluids leak-off
- Proppants
- Fracture Treatment Design
- Preparing Frac Treatments
- Fracturing Evaluation
- Acid Fracturing
- Production Predicition
- Theoretical considerations
- Acquisition
- Basic processing
- Fracture interpretation
- Interpretation pitfalls

AUDIENCE

This course is aimed for geoscience and engineering personnel involved with the mapping of fracturing operations using microseismic, in the planning, execution, and interpretation of microseismic data to image hydraulic fracturing.

PREREQUISITE

Basic knowledge of well completions and well intervention opertations.

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.

Advances in Coiled Tubing (Spanish)

Skill – 5 Days

This 5-day course is delivered by a Spanish speaking instructor with presentations in Spanish. This 5-day course discusses advances in Coiled Tubing applications and latest developments addressed initially for the shale market in the United States, but slowly are being adopted in conventional Coiled Tubing market. The course revisits typical Coiled Tubing concerns (pressure control and high pressure applications, CT logging and perforating, pipe management, among others), fundamental for beginners, while providing value even to the most experienced participants in the class. Preferentially, the course is to be deilivry near a Schlumberger Coiled Tubing field base to enable a visit for visualization of equipment.

COURSE CONTENT

- Wellcome 1st day Quiz Revision of CT applications CT equipment Pressure Control Equipment
- Visit to a Coiled Tubing base Coiled Tubing data aquisition system Coiled Tubing manufacturing Coiled Tubing string and pipe management
- Logging with Coiled Tubing Coiled Tubing Job Design Coiled Tubing Perforating • Contingency Planning and Emergency Reponses High Pressure Coiled Tubing
- Coiled Tubing Case Studies Coiled Tubing New Technologies Coiled Tubing Downhole Tools Coiled Tubing Completions
- "BlueCoil" - CT new technology Last day Quiz

AUDIENCE

Drilling and Completion Engineers, Well Intervention Engineers and Supervisors, Production Engineers and Supervisors and other personnel related to well intervention operations.

PREREQUISITE

Experience in Well Completions and Well Interventions.

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
- Description of fluid flow in porous media (pressure diffusion)
- Pressure versus flow rate relationship (Darcy equation/linear-radial)
- 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
- Introduction to DST
- DST workshop
- Introduction to subsea operations
- Explanation of subsea operations
- Subsea tools overview
- Reservoir fluid sampling and analysis
- 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
- Introduction to TDA
- 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.

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
- 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.

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
- Equipment Review Continued & Hand Calculations
- Software & Alternative ESP Installations
- Equipment Analysis
- Trouble Shooting
- Monitoring, Run Life and Questions

AUDIENCE

Production / Artificial Lift Engineers.

PREREQUISITE

None.

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.

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

Production engineers, petroleum engineers and service company engineers.

PREREQUISITE

Experience with well operations and well engineering.

Well Integrity - Cement Placement Evaluation

Skill – 2 Days

Cement integrity is critical for the whole well integrity as it is the first barrier in between the reservoir (P and T) and surface. Measuring cement integrity remains a challenge. Most tools measure an acoustic property of the cement while integrity depends more on permeability. Hence the need to be able to read and interpret with the greatest confidence as possible the logs.

COURSE CONTENT

- Exercises on understanding how to assess the quality of a sonic or ultrasonic log i.e can the information contained in the log be trusted and be able to read the logs without being tool specialist.
- Real logs (ultrasonic and VDL) are given to the Participants. The instructor plays the role of the cementing company.

AUDIENCE

Drilling, Production and Completion Engineers and other personnel in need to evaluate the quality of primary cementing operations.

PREREQUISITE

A fair knowledge of the cementing process is required. A basic knowledge of the sonic and ultrasonic bond logs is a plus but not absolutely necessary.

Continuous Gas Lift - Design, Diagnosis and Optimization

Skill – 5 Days

Continuous Gas Lift is one of the most popular methods used around the world. It is considered as an extension of natural flow. The technique consists to inject gas at the deepest point possible inside the annulus with the objective to reduce liquid density and minimize the weight of the fluid column above the formation, increasing the flow rate. Because the system have few moving parts, it is considered a reliable and safe method. Continuous gas lift is usually more efficient and less expensive for wells producing at high flow rates.

COURSE CONTENT

- Principle of Application
- Advantages and Disadvantages of the Method
- Well Performance and Multiphase Flow
- Description of the Gas Lift Surface and Downhole Equipment
- Principle of Operation
- Classification of Gas Lift Valves
- Opening and Closing Forces of Gas Lift Valves
- Valve Calibration in the Shop
- Determination of the Gas Lift Seat Size
- Visit to the Artificial Lift Inverurie Gas Lift Workshop
- What's new in the Gas Lift world (ISO and API standards)
- Temperature effect on unloading gas lift valves
- Preliminary Calculations
- Design Procedure
- Discharge Process

AUDIENCE

Production engineers, field supervisors, reservoir or related areas, responsible not only for surveillance and control of production operations from oil wells, but also for the design, performance and monitoring of gas lift installations.

PREREQUISITE

Knowledge of the basic principles of nodal analysis and basic computer skills are required.

Acidizing Sandstones and Carbonates

Skill – 5 Days

To introduce the basic principles of matrix acidizing treatments in sandstones and carbonates, provide information on candidate selection for matrix treatments, and understand the importance of formation properties in the design of the treatment and fluid selection. The chemistry of acidizing is discussed with emphasis on potential damage due to by-products precipitation. Formation damage is discussed and their mechanisms are identified. Post-treatment production improvement is estimated. Rules for Treatment Design are applied and Operational Procedures are recommended.

COURSE CONTENT

- 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.

Modern Production Logging

Skill – 5 Days

Water identification and fluid movement in both injection and producing wells are evaluated using spinners, tracers, pulsed neutron oxygen activation, temperature and noise surveys. A variety of fluid identification devices are used to evaluate multiphase flow. These tools together are used to quantify the sources of water, oil, and gas production, and are critical to the control of excessive water or other phases. Inflow Performance Relationships (IPR) are determined for individual downhole zones. Special considerations are given for deviated and horizontal wells.

COURSE CONTENT

- Logging techniques for vertical, deviated and horizontal wells
- The cased hole logging environment
- Basics of depth control
- Flowmeter response and quality control
- Flow evaluation using spinners
- Flow regimes
- Fluid identification logs for multiphase flow
- Multiphase flow concepts
- Holdup, cut and slip velocity
- Productivity index, inflow performance, zonal production
- Evaluating deviated and horizontal wells
- Effects of deviation on spinner response and slip velocity
- Temperature and Noise Logging
- Nuclear techniques for fluid flow
- Radioactive tracers
- Fiber optic theory

AUDIENCE

Reservoir and production engineers and geologists, petrophysicists, log analysts and others involved in well surveillance, maximizing recovery, identifying production problems, or planning workover operations.

PREREQUISITE

None.

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
- Shaped-charge design
- Tubing-conveyed perforations (TCPs)
- Completions without killing
- 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
- 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.

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

AUDIENCE

Production engineers and reservoir engineers with a basic knowledge in this area who are involved in the monitoring and performance of oil and gas wells.

PREREQUISITE

None.

Oilfield Water Management

Skill – 5 Days

This course covers the entire oilfield water cycle with emphasis on the subsurface aspects, including Producer performance with water, Injector performance, Water sweep in the reservoir, A review of surface treatement of produced water and water for injection or disposal. Fundamental concepts are introduced so that participants are able to analyze water aspects of field performance and select suitable solutions.

COURSE CONTENT

- Course introduction and administrative issues
- Introduction to the water cycle
- Introduction to water flow
- Diagnostic methods
- Reservoir solutions
- Water problem types
- Nodal analysis for water
- Logging for water
- Diagostic methods
- Injection mechanisms and problem types
- Diagnostic methods
- Injector solutions
- Produced fluids
- Water quality for injection or disposal
- Facilities solutions
- Exercises on the Aquarius facilities
- Analysis of the whole water cycle
- Exercises on the Aquarius field

AUDIENCE

This course is suitable for practicing production and reservoir engineers interested in improving the water management of fields. Participants should be proficient in the use of Excel.

PREREQUISITE

Understanding of basic geological and reservoir concepts. Proficient in Excel.

Practical Completions and Production Engineering

Skill – 5 Days

This 5-day course emphasizes the role of the Well as part of the Integral Production System for a Hydrocarbon Asset. The concepts of Well Completion design and the technical selection criteria for the main completion components are reviewed in detail. The last is a visit to the workshops and yards of the Schlumberger Middle East and Asia Learning Center (MLC) to familiarize with well completion and well intervention equipment, technologies and tools. Group exercises on Completions and Performance enhance the learning process. The course also highlights the Operating Company's viewpoint in the area of Well Completion and Well Production Management.

COURSE CONTENT

- Introduction to the course

- Well Completions and Performance
- Well Completion Methods
- Five Reservoir Fluids
- Gas Deliverability
- Gas Deliverability Exercises
- Multi-phase flow in pipes
- Choke performance
- Nodal Analysis
- Gas Deliverability
- Gas Deliverability Exercises
- Multi-phase flow in pipes
- Choke performance
- Nodal Analysis
- Tubing Connections
- Packers
- Packer Selection
- Wellheads and X-mas Trees
- Gas Well Completions
- Running Completions
- Sand Control
- Multilaterals
- Visit to MLC to familiarize with well completions equipment and well intervention (coiled tubing) equipment and tools.

AUDIENCE

Geo-scientists, Engineers and Managers (in drilling, well interventions/services, reservoir engineering, production operations, marketing/sales, among others) whose jobs require them to interface with Completion Engineers, Production Technologists, Well Production Operation Engineers and Well Maintenance/Service Engineers.

PREREQUISITE

It is recommended that Participants have, at least, 2 years experience in the Oil Industry in subsurface engineering/operations/management.

Subsurface Surface Production Optimization

Skill – 5 Days

A production system is the system that transports reservoir fluid from the subsurface to the surface and separates it into oil, gas, and water. From there the oil and gas streams are treated if necessary and prepared for sale or transport from the field. Any water produced will also treated and prepared for disposal or reinjection into the reservoir. This course will provide participants with the knowledge of integrated subsurface surface production optimization. During this course, participants will also learn about nodal analysis and the identification of major pressure losses from the reservoir to separator. The use of specialized software to identify constraints and to propose recommendations to optimize the field will also be covered.

COURSE CONTENT

- Production system loops
- Well completion and production methods
- Production well test
- Gathering and processing facilities
- Main components of pressure drop
- Inflow Performance Relationship (IPR): reservoir, completion
- Subsurface to surface system
- Flow rates in pipes and restrictions
- Identification of restrictions and correctives actions
- Performance management
- Advanced optimization applications
- Integrated application systems
- Software used in Industry
- Production system modeling
- Well instrumentation technology
- Oil and gas production applications
- Smart wells and fields

AUDIENCE

Engineers working in oil and gas fields, to include Reservoir Engineers, Production Technology Engineers, Production Operation Engineers, and Production Managers.

PREREQUISITE

Participants should have a basic knowledge of the production system.

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.

Matrix Stimulation Engineering

Advanced – 5 Days

The 5-day workshop consist of lectures and work sessions directed at improved treatment success and well performance. You 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. Students 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
- Production Prediction/Stimulation Technique Selection
- Formation Damage Characterization & Removal
- Sandstone Acidizing: Fluids & Design
- Matrix Additives: Types/Application
- Placement and Zone Coverage: Diversion
- Matrix Stimulation Laboratory
- Design Methodology/Workshop
- Job Preparation and Quality Assurance
- Treatment Evaluation
- Carbonate Acidizing
- Horizontal Well Matrix Stimulation
- Design Workshop
- Design Workshop Presentations

AUDIENCE

Engineers, Managers, Researchers, Geologist, 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.

Shale Plays Production - Exploiting Production Sweet Spots

Advanced – 4 Days

This course provides participants with focused instruction on the engineering aspects of shale hydrocarbons exploitation. Participants will be exposed to the methods and workflows for characterizing, and developing shale hydrocarbons resources including well architecture & placement, completions, hydraulic fracturing and producing. They will gain a foundational understanding of the complete asset life cycle: exploring, appraising, developing and producing. They will also review field examples as the basis for discussion and in-class exercises on economic viability of assets.

COURSE CONTENT

- Introduction, Well Architecture and Placement – In day one, the course will cover the basic shale gas and liquids geological, geophysical, and geomechanical considerations.
- Completions – In day two, the course will introduce the integration process and best practices in designing completions.
- Fracturing and Fracture Evaluation – In day three, the course will introduce stimulation operations and evaluate completion efficiency.
- Production Philosophies – In day four, the participants will be exposed to production and field redevelopment strategies to maintain production. Introduce tools and workflows for production monitoring and control.

AUDIENCE

This course is designed to expose the multi-disciplinary asset team of operating companies comprising of engineers, geoscientists, financial decision makers, and managers to shale hydrocarbons resource.

PREREQUISITE

4 Years Geoscience/Engineering Degree.

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
- Facturing Methodology
- Hydraulic Fracturing Modelling
- Frac Fluids
- Frac Fluids Additives
- Proppants
- Shale Fluids and Proppants
- Shale Geomechanics
- Brittleness
- In-Situ Stress Testing
- Perforating Horizontal Wells
- Facture Complexity
- Wiremesh and Unconventional Fracture Models
- Horizontal Justification
- Vertical Wells and Lateral Landing Points
- Horizontal Well Cementing
- Round Table

AUDIENCE

Reservoir Engineers, Production and Completion Engineers and other technical staff involved in fracturing design and operations in shale formations.

PREREQUISITE

Exposure to the concepts of fracturing in conventional formations and general knowledge rock mechanics.

Matrix Stimulation in Carbonates

Advanced – 5 Days

The 5-day workshop consist of lectures and work sessions directed at improved treatment success and well performance. You 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. Students 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 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)
- 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 proction and general knowledge of well intervention.

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
- 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 service delivery procedure introduction
- TCP correlation and spaceout
- TCP SPAN introduction (Schlumberger perforating analysis software)
- DST Advanced
- DST service delivery procedure introduction
- DST job design and DST calculation
- 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
- 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.

Fracturing Pressure Analysis

Advanced – 4 Days

The course objective is to provide students with theoretical and practical expertise

to acquire both the reservoir transmissibility and pressure required for fracturing production optimization and the correct in-situ state of stress controlling frac placement. The course covers the integration of fundamentals of rock stresses, pressure diffusion, leak-off, poro-elasticity, closure analysis(GPlot) , After Closure analysis (minifalloff method) applied to conventional fracturing models and their calibration using field data. Applicability to extremely tight reservoir (shale) are discussed.

COURSE CONTENT

- Fracturing History and Concepts
- Insitu stress and incipient failure - non-elastic rock - poroelasticity
- Dynamic closure test (datafrac part 1)
- Material Balance
- Frac Pressure & PTA - Geometry model
- G-plot decline analysis (datafrac part 2)
- Leak-off
- ACA's Theory and Disgnostic Plot
- Vertical Fracture Complexity (shales) (short picture set of slides)
- Exploration Fracture in vertical wells
- Workshop
- Local example analysis (max. 8 data sets, 1hr/each)
- 20 min - presentation of cases (geological context, local practice, well specifics)

AUDIENCE

Production and Reservoir Engineers and other professionals involved in the design and evaluation of hydraulic fractures.

PREREQUISITE

Exposure to Hydraulic Fracturing Design and Evaluation.

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.

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
- 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.

Frac Packing Course

Advanced – 5 Days

This 5-day course discusses the purpose of frac packing as a well completion technology. The course discusses in-depth concepts concerning hydraulic fracturing, geomechanics and sand control techniques. The course starts with a revision of sand control techniques, emphasising the application of different sand control methods taking into consideration formation properties, well geometries and production targets. A throughout discussion of geomechanics, applied to hydraulic fracturing, sets the basis for the understanding of frack packing design. During the last two days of the course it is explained how to select fracturing fluids and proppants. The course ends with the explanation of methods to prepare, supervise and evaluate frac paks and predict production.

COURSE CONTENT

- 1st day quiz
- Introduction to OH vs. CH Sandface technique selection
- CH sand exclusion
- Basic concepts of petroleum rock mechanics
- Frac initiation
- Near wellbore geometry
- Fracture containment
- Fracturing fluids
- Fracturing fluids leak-off
- Frac Pack technique
- Wellbore Geomechanics Fundamentals

- Rock Mechanics Testing and Modeling
- Well Stability Analysis
- Tip screen out
- Perforating requirements
- Alternate Path
- Quality control and supervision
- Production Prediction

AUDIENCE

Reservoir engineers, production engineers, completion engineers and other personnel in need to deal with sand control methodology, and frac packing in particular.

PREREQUISITE

Participants need basic concepts of production engineering and well completions.

Integral Well Productivity

Advanced – 10 Days

A comprehensive discussion of the sub-surface production system, enabling detailed analysis and diagnosis of production impeachments and their corrective mitigation, has to take in to account the integrality of the production system: from the reservoir offer and limitations to the wellbore restrictions and the production completions. This 2-week course discusses methods to analyze reservoir behavior and optimize production based on decline curve analizis and Nodal analysis. Also, the course discusses the performance of fracturing completions and acid stimulations.

COURSE CONTENT

- 1st day quiz
- Five Reservoir Fluids
- Inflow Performance in Oil Wells
- Inflow Performance in Gas Wells
- Damage and Skin
- Formation Damage
- Vertical Multiphase Flow
- Optimization Using Nodal Analysis
- Conventional Decline Curve Analysis
- Decline Curve Analysis in Multilayers
- Advanced Decline Curve Analysis
- History of Fracturing
- Fracturing Production Prediciton
- Acid Fracturing-Perforations Requirements
- Fracturing Mapping
- Fundamentals of Acid Stimulation
- Matrix Stimulation or Perforating
- Paraffins and Asphaltenes
- Mini-frac testing
- Frac growth analysis
- Post-frac evaluation
- Flow through restrictions
- Productivity of horizontal wells
- Fracturing horizontal wells
- Production separation systems
- Economics in Well Interventions

AUDIENCE

Reservoir and Production Engineers.

PREREQUISITE

Knowledge of basic concepts of Reservoir Engineering, Petrophysics and Production Engineering and experience dealing and solving field problems related to well productivity.

Production Data Analysis - Shale Gas

Advanced – 2 Days

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. This 2-day course discusses Production Modelling and Production Data Analysis for Shale Gas reservoirs.

COURSE CONTENT

- Introduction to Unconventional Production Fundamentals
- Production Modeling
- Production Data Collection
- Production Data Analysis

AUDIENCE

This course is designed for the practicing reservoir, production and facilities engineers and engineering and asset managers.

PREREQUISITE

4 Years Geoscience/Engineering Degree.

Fracturing Pressure Analysis (5 days)

Specialized – 5 Days

The course objective is to provide students with theoretical and practical expertise to acquire both the reservoir transmissibility and pressure required for fracturing production optimization, and the correct in-situ state of stress controlling frac placement. The course covers the integration of fundamentals of rock stresses, pressure diffusion, leak-off, poro-elasticity, closure analysis(GPlot), After Closure analysis (minifalloff method) applied to conventional fracturing models and their calibration using field data. Applicability to extremely tight reservoir (shale) and microfrac stress test are also covered and discussed.

COURSE CONTENT

- Fracturing History And concept
- Pressure Transient Analysis: a review from Horner to pressure derivative
- Fractip-Origin of Log log and Pressure derivative
- Insitu stress & Incipient failure- non elastic rock – PoroElasticity
- Material balance: Fundamental of Frac Modelling
- Frac Pressure & PTA - Geometry model
- Dynamic closure test (Datafrac part 1)
- Near Wellbore stress & Non align Frac
- Leak-off theory and insight

- G-plot decline analysis (Datafrac part 2)
- Wellbore Frac height log Temp-Tracer-CHSA
- Minifrac / SRT hands-on
- ACA's Theory and log log Diagnostic plot and example (4hrs)
- Vertical Fracture Complexity (shale) (short picture set of slide)
- Exploration Fracturing in vertical wells
- Local example analysis, max 8 data set 1hrs / each (need ascii data of job, BHP in priority)
- 20 min presentation of cases (geological context, local practice, well specific)
- 40 min of discussion

AUDIENCE

Production engineers and other professionals involved in the design and evaluation of hydraulic fractures.

PREREQUISITE

Good domain of fracturing principles, both in design, in execution and evaluation.

OFM Analysis Dashboard

Awareness – 4 Hour

This course introduces OFM Analysis dashboard as powerful data visualization tool helping you revel information to support better decision-making. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and shared results. You will learn to create highly efficient dashboards for production surveillance, project economics assessment, data mining, and data quality control.

COURSE CONTENT

- Introduction to OFM analysis dashboard

AUDIENCE

Anyone interested in gaining a general understanding of OFM Analysis Dashboard.

PREREQUISITE

None.

OLGA Flow Assurance - 3 days

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 in 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.

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.

COURSE CONTENT

- Introduction to the Avocet user interface and its main components
- Creation of the subsurface network and wellbore schematic
- Creation of the surface network and network diagram
- 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

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 Fundamentals

Foundation – 2 Days

The OilField Manager (OFM) Fundamentals course introduces new users to OFM functionality with emphasis on visualization, reporting, and data analysis. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and share results. This course covers basic usage of the application, providing an understanding of how to configure and personalize an OFM workspace, to use and create project variables.

COURSE CONTENT

- A brief walkthrough of a fully functioning project, providing 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
- Explore OFM analysis dashboard
- Create and format well and field summary reports
- Export reports and table data to other applications

AUDIENCE

Anyone interested in gaining a general understanding of OilField Manager (OFM).

PREREQUISITE

An interest in using OFM software.

OLGA Flow Assurance - 5 days

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
- 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

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 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. This course includes 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
- Network Model Building
- 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

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. .

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
- 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
- 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.

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 Production Examples

Foundation – 2 Days

This course introduces you to the primary functionalities of OFM by allowing you to interact with a pre-prepared oil production project. The flow of the course centers on you acting as a member of a fictional engineering team, charged with accomplishing a number of common tasks in OFM. As the course progresses, it covers each of the tasks. In accomplishing the tasks, you are exposed to the range of common features of the application. During the course, you will learn how to use OFM as a quality assurance tool, seeking deficiencies in the data, before using the project data to illustrate primary and derived performance parameters.

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.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

OFM Intermediate Using Gas Operations

Skill – 2 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.

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 to Fundamentals course level.

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

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

AUDIENCE

Production and well performance engineers involved with offshore well operations.

PREREQUISITE

None.

PIPESIM Advanced Well Modeling

Skill – 2 Days

In this course, you will learn how to use PIPESIM to simulate wells for designing completions and artificial lift systems. The designs are then evaluated for future conditions based on changing reservoir characteristics.

COURSE CONTENT

- Conceptual well design for deepwater developments
- Subsea tieback design to account for backpressure effects
- Evaluate inflow performance
- Design optimal perforations
- Perform gas lift design
- Perform ESP design
- Evaluate the effectiveness of multiphase boosting
- Review alternatives based on forecasting

AUDIENCE

Anyone who needs to learn how to evaluate various artificial lift options, optimize gas lift allocation, and perform ESP design using PIPESIM software.

PREREQUISITE

PIPESIM Fundamentals or a working knowledge of PIPESIM software.

Avocet Administration I

Skill – 3 Days

This course provides basic understanding of Avocet 2014 architectural components with emphasis on data integration for both low and high frequency. The course covers installation and load data providing an understanding of how to deploy Avocet. You will learn about Avocet configuration, language support, units and security. You will build a surveillance dashboard and reports. This course has been designed to provide you with a basic understanding of administration tasks, as well as to drive you through the most commonly operational scenarios for an Avocet project

COURSE CONTENT

- Understand the architectural components
- Install Avocet – both the low and high frequency elements
- Work with the major configuration files
- Set up language support, units and security
- Run maintenance processes
- Review the type system – Avocet's data modelling paradigm
- Load data and create reports
- Design and host dashboards

AUDIENCE

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 streamlined 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, 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 waterflood operations, all calculations need to be made on a reservoir volume basis. This course introduces PVT as a way of achieving this goal.

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.

PVT For Flow Assurance And Production Engineering Applications

Skill – 5 Days

The key for flow assurance modeling in PIPESIM and OLGA is through proper fluid modeling. This course gives a comprehensive overview of EOS fluid modeling for systems where solids may form. Procedures for matching EOS model to lab experiments are covered as well as the procedure to export black oil or compositional files for production simulators like PIPESIM and OLGA.

COURSE CONTENT

- PVT sampling techniques
- Compositional analysis
- PVT experiments and PVT reports
- Quality control of fluid compositions
- EOS modeling of petroleum fluids
- C7+ characterization and lumping
- Viscosity tuning
- Multiple fluid EOS modeling
- Modeling of Polar components: water and salts
- Hydrates
- Hydrate inhibitors
- Asphaltenes

AUDIENCE

Who wants to expand their knowledge in PVT fluid modeling for OLGA or PIPESIM applications.

PREREQUISITE

Attendees need a working knowledge of the basic OLGA or PIPESIM. Previews experience in simulations on petroleum fluids with an emphasis on flow assurance is an advantage.

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
- Predict gas hydrate formation, erosion, corrosion, and liquid loading in gas wells
- Model centrifugal and reciprocating gas compressors
- Compare the relative benefits of push versus pull compression
- Estimate the required slug catcher size
- Model a transmission network

AUDIENCE

Production engineers, facilities engineers, and field production operations engineers.

PREREQUISITE

General petroleum engineering knowledge as well as elemental software skills.

Avocet Mobile Data Capture

Skill – 1 Days

This course provides an understanding of how to deploy the Avocet* Mobile Data Capture app. It explains the elements of the Avocet architectural components and configurations. It also shows you the process of creating a web environment for the Avocet Mobile Data Capture app.

COURSE CONTENT

- Understand Avocet architectural components
- Introduction to Avocet Web Service
- Configuration of Avocet Mobile Capture app

AUDIENCE

People responsible to install, deploy, and configure Avocet and its extensions.

PREREQUISITE

Prior knowledge of Avocet would be useful, but is not required.

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
  - 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 coarse or at least e 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.

OLGA Process Equipment Workshop

Advanced – 1 Days

This one day workshop combines lectures and hands-on exercises to discuss the use of the various options for Process Equipment in OLGA. The workshop shows how to use the various options, and, more importantly, when to use them and when not to use them.

COURSE CONTENT

- Overview of Process Equipment in OLGA
- Review of Valve Calculation Methods in OLGA
- Summary of the various options available for valves, including examples and recommendations
- Discussion of Check Valves/Standing Valve in OLGA
- Discussion of Heat Exchangers in OLGA
- Presentation of the various types of controllers in OLGA
- Several exercises on controllers including tuning options for PID controllers
- Discussion and an exercise on Separators
- Review of the types of Pumps available in OLGA
- Exercises using Pressure Boost, Multiphase Pump, and Centrifugal Pump
- Discussion and an exercise on Compressors
- Discussion of links to dynamic process simulators using OPC Server

AUDIENCE

Experienced OLGA users who are interested in learning more about the use of the various process equipment models in OLGA.

PREREQUISITE

Workshop attendees need a working knowledge of the basic OLGA. One year or more experience with the program preferred.

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 nalyses on a waterflood project in OFM* well and reservoir analysis software.

PREREQUISITE

OFM software proficiency or OFM Fundamentals course.

OLGA Fluid Handling Workshop

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 & 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 Administration II

Advanced – 2 Days

This course provides a deep understanding of Avocet 2014 architectural components with emphasis on extensibility of the data model and database

schema. You will learn about features of the oil and gas Avocet layers, extensibility of the data model, extensibility of the database schema, transaction rollup, customized report with reporting services, and configuration of analystics.

COURSE CONTENT

- Web client,
- ClickOnce deployments,
- SQL server reporting services,
- Data cube for analytics
- Explore the use of the application server to distribute a processing load
- Explore the features associated with oil and gas layers
- Explore the data exchange utility and build a simple data exchange that works from a SQLite database like Prosource or Seabed.

AUDIENCE

Anyone interest to install, deploy, and configure Avocet and its extensions.

PREREQUISITE

Avocet users who have attended the Avocet administration II.

OLGA Heat Transfer Workshop

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 predict heat transfer. The workshop includes discussion of which model to use for a set of typical examples.

COURSE CONTENT

- Review of heat transfer fundamentals
- Review of heat transfer models in OLGA
- Standard radial heat transfer method, including examples
- Discussion of buried pipeline modeling in standard OLGA including example
- Importance of pipeline wall modeling in transient operations, including examples
- Annulus keyword
- Modeling of the extent of the heat front into the surrounding rock
- Buried pipelines with cover
- Modeling of heavy oil transport pipelines, including example

AUDIENCE

Experienced OLGA users who are interested in learning more about heat transfer prediciton in OLGA.

PREREQUISITE

Workshop attendees need a working knowledge of the basic OLGA. One year or more experience with the program preferred.

Techlog Wellbore Integrity VILT

Skill – 2 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers and Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

Artificial Lift Methods

Foundation –3 Days

The Artificial Lift Methods is a VILT (Virtually Instructor Led Training) course delivered in real time. The course will be taught in 4 hour sessions over a 3 day period and is delivered using the WebEx platform. Our virtual training methodology incorporates passive and active learning in an effort to achieve the best virtual training experience. This course will allow the participants to learn the fundamentals of the following Artificial Lift Methods: Gas Lift (GL), Rod Pumps (RP), Progressive Cavity Pumps (PCP) and Electrical Submersible Pumps (ESP) systems.

COURSE CONTENT

- Overview of Artificial Lift
- Well Performance - Inflow Performance Relationships
- Comparison of Artificial Lift Systems
- Gas Lift Systems
- Principles of Gas Lift
- Rod Pump Systems
- Surface Equipment
- Subsurface Equipment
- Progressive Cavity Pumps System
- Subsurface Equipment
- Electric Submersible Pumps (ESP)
- Subsurface Equipment

AUDIENCE

Engineers or geoscientists involved in wells surveillance, maximizing recovery or identifying production problems in artificially lifted wells.

PREREQUISITE

Participants should be familiar with basic Production Engineering concepts and have some field experience in Production.

Integrated Production Optimization

Foundation –3 Days

This course overviews 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 Fooding); 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 (identificaiton 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
- Definition and classification of enhanced oil recovery (EOR) methods
- Limitations of different EOR methods and their environmental impacts ?
- Formation Damage and Productivity (45 min)
- Formation Damage Mechanisms
- Skin, Influence of Skin in Productivity
- Sandface Completions
- Gravel Pack, Natural Sand Pack
- Applications and Limitations
- Hydraulic Fracturing
- Purpose of Hydraulic Fracturing
- Hydraulic Fracturing Models
- Subsurface Surface Production optimization
- Revision of Integrated Production System
- Subsurface Surface Production Management
- Identification of restrictions and correctives actions
- 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 prsonnel 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

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 | SOFTWARE | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Maintenance and Reliability	Surface Facilities Engineer
ADVANCED		Assuring Flow from Pore to Process
SKILL	Plant Turnaround Management (Programmed Plant Shutdown)	The Pipeline Transportation of Produced Hydrocarbons
	Condition-Based Maintenance For Static and Rotating Equipments	Multiphase Pumping
	Maintenance Management and Control Indicators	Subsea Production Systems (SPS) and Technologies
		Subsurface Surface Production Optimization
		HAZOP
		Oilfield Corrosion Management
		HAZOP/HAZID and SIL
		Failure Mode Effect Analysis (FMEA) Applied to Production Operations
		Multiphase Flow
		Automation, Instrumentation, Measurements, and Process Control
FOUNDATION	Maintenance Cost Control	Vx Multiphase Meters Operations
	Reliability Methodologies Applied to Maintenance	Gas Conditioning and Handling
	Risk and Reliability Engineering	Utilities: Design and Operations
	Maintenance Integrated Planning	Instrumentation and Control Basics
	Maintenance and Reliability	Introduction to HYSYS in Oil and Gas Processing
		Gas Processing and Conditioning
		Introduction to Flow Assurance
		Crude Oil and Water Treatment
		Gathering System and Network
		Surface Facility Production Operations
		HSE in Exploration and Production
		Oil Processing and Conditioning
		Introduction to HAZOP and Process Hazard Analysis (PHA)
	Piping and Pipeline Design, Maintenance, and Operation	
	Offshore Facilities	
	Introduction to Oil Field Surface Facilities Operations with Simulator	
	Gas and oil pipeline operations	
		Metering/Measurements and Production Test

Surface Facilities Design and 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.

DOMAIN | **SOFTWARE** | INTEGRATED/BLENDED | VIRTUAL CLASSROOM

Avocet	OLGA	PIPESIM	COMPETENCY LEVEL
Avocet Administration II	OLGA Advanced Flow Assurance		ADVANCED
	OLGA Fluid Handling Workshop		
Avocet Administration I	OLGA Well Dynamics	PIPESIM Gas Field Production Operation	SKILL
Avocet Mobile Data Capture	PVT For Flow Assurance And Production Engineering Applications		
Avocet Fundamentals	OLGA Flow Assurance (3 days)	PIPESIM Surface Facility	FOUNDATION
	OLGA Flow Assurance (5 days)	PIPESIM Fundamentals	

Surface Facilities Design and 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.

DOMAIN | SOFTWARE | **INTEGRATED/BLENDED** | VIRTUAL CLASSROOM

Surface Facilities Engineer	COMPETENCY LEVEL
Practical Flow Assurance Using Transient OLGA Simulation	SKILL
Pipeline and Gathering System: Theory and Applications	FOUNDATION

Surface Facilities Design and 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.

DOMAIN | SOFTWARE | INTEGRATED/BLENDED | **VIRTUAL CLASSROOM**

Surface Facilities Engineer	COMPETENCY LEVEL
Production Chemistry	FOUNDATION

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
- Effect of wrong inputs
- Input troubleshooting, from symptom to root cause
- Practical meter operations
- Implementing a maintenance and surveillance strategy
- Example of applications of Vx MPFM data
- Data quality control and troubleshooting tutorial
- Q&A session
- Evaluation
- Class evaluation
- Roundtable and wrap-up

AUDIENCE

Production engineers, petroleum engineers, production supervisors, wellsite operators and engineers, facilities engineers, facilities operators.

PREREQUISITE

Computer literacy and fundamental scientific skills; some experience in production metering operations.

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
- Root cause analysis
- Risk-cost-benefit analysis
- Risk analysis: from deterministic to probabilistic
- Risk matrices
- Reliability integral system
- Reliability based on conditions
- Risk propagation
- Strategy for a reliability integral system
- Real case exercises

AUDIENCE

Maintenance and reliability engineers, maintenance planners, surface facility operation engineers, production engineers.

PREREQUISITE

None.

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.

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.

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 abouts 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.

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 forr 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
- 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)

AUDIENCE

Process engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, and surface facilities project engineers.

PREREQUISITE

Awareness of surface facilities production system.

Maintenance and Reliability

Foundation – 5 Days

This course introduces classic and current techniques for maintenance and reliability decision making. Attendees will learn to apply a reliability probabilistic approach, conduct cost-benefit analysis, and implement predictive maintenance activities. The course focus is on the information typically available in most operations and how it can be used to conduct failure analysis. The attendees will 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 principlesn
- 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.

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.

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
- NGL fractionation plant simulation
- Process optimization

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.

Gas Processing and Conditioning

Foundation – 5 Days

This course covers the major technical aspects of gas processing and conditioning. Attendees will obtain an overview of the fundamentals and tools used to determine the main properties of natural gas as they relate to gas separation, dehydration, sweetening, measurement, and transportation. The course focuses on plant and equipment design and operations and includes in-class exercises for the identification of key variables for optimal designs and operations.

COURSE CONTENT

- Natural gas properties and behavior
- Water-hydrocarbon behavior and the effect of contaminants (H2S, CO2)
- Hydrates: Problem, deposition site, impact, composition and structure, conditions of formation; hydrate detection, control, and remediation
- Gas separation: Principles, types, multistage process, condensate stabilization, and multiphase separators
- Gas sweetening: Processes, designs, and operating aspects
- Gas dehydration: Common operational problems and possible solutions
- Gas measurements
- Gas transportation system
- Glycols vs. solid desiccants
- Transportation systems
- New developments and emerging technologies
- Commercial issues
- Technological challenges for natural gas production

AUDIENCE

Engineers, gas plant managers, and supervisors responsible for gas processing operations or design.

PREREQUISITE

General knowledge of oil and gas production systems.

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
- Water treatment

AUDIENCE

Surface facilities operation and design engineers, production chemists, flow assurance engineers, and production engineers wanting a better understanding of the treatment fundamentals for oil and water.

PREREQUISITE

Basic knowledge of oil and gas production systems and crude oil properties.

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
- Corrosion classification and mechanism
- CO2 and H2S corrosion

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.

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
- 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
- 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)
- Pigging: 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
- 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.

Introduction to HAZOP and Process Hazard Analysis (PHA)

Foundation – 5 Days

In this course, participants will study the role of process hazard analysis (PHA) in the oil and gas production processing systems. Attendees will learn the main differences between two PHA methods: hazard and operability (HAZOP) analysis and the what-if/checklist technique. The course will also cover how to run a HAZOP.

COURSE CONTENT

- Introduction to PHA
- What-if/checklist technique
- HAZOP technique
- Introduction to human error
- Approaches to mitigate error-likely situations
- Illustration of error-likely situations, with practical examples
- Simulation of HAZOP/what-if workshop study

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
- Pipeline design
- Location classification
- Pipeline construction
- Hydrostatic test
- Corrosion considerations
- Pipeline operation
- Coating monitoring and inspection
- 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.

Offshore Facilities

Foundation – 5 Days

This course is designed for offshore, topside, and subsea engineers. This course covers the basic understanding technologies and processes for the offshore facilities for shallow, deep and ultra deepwater. The course will include an analysis of the phases for offshore oil and gas developments, as well as a timeline method for the calculation of construction, assembly work, and inventory when developing offshore fields.

COURSE CONTENT

- Major trends of construction development in the offshore areas
- Offshore facilities classification
- Typical development phase and timeline for offshore project
- Offshore Production Facilities
- Wellheads and umbilical
- Pipelines and risers
- Oil and gas processes
- Offshore Facility Construction
- Structural considerations
- API RP2A evolution
- Subsea Production System (SPS)
- Concepts and definitions
- Advantages and disadvantages
- Flow lines, flow assurance, and material selection
- Digital Oilfield Monitoring
- Data acquisition and management

- Control and monitoring systems
- Instrumentation and integrated system

AUDIENCE

Subsea engineers, topside engineers, facilities engineers, and production engineers.

PREREQUISITE

None.

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
- Compressor Operation
- Reciprocating Compressors
- Centrifugal Compressors
- Instrumentation and System Control
- Introduction to Instrumentation
- Troubleshooting Instrumentation
- Process Control
- Well System Operation
- Introduction to Production Operations
- Monitoring Well Operation
- Alarms and Interlocks
- Well System Operation (Cont.)
- Optimizing Well Production
- Troubleshooting Production Issues

AUDIENCE

This class is aimed at entry level of operation engineers and technician.

PREREQUISITE

None.

Gas and oil pipeline operations

Foundation – 5 Days

This course will provide participants with the necessary knowledge to demonstrate the principles of pipeline operation and maintenance in a mechanical and technological environment. This course has been 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
- Engineering required before designing an onshore pipeline
- Pipelines - system
- Pipelines - terminology
- Pipeline project life cycle & planning
- Pipeline Construction
- Pump Station Safeguards
- General Material Requirements
- Sour Service Requirements
- Hydrotesting
- Hot Tapping and Stopple
- The uses of pigs - general
- Pipeline pigging system (pigs, services, components
- Pipeline design factors
- Block valves & black valve station facilities Overview
- Block valves
- Hydro Test Pipeline the First Non-Routine Activity
- Fundamental of Corrosion
- Factors Influencing Oilfield Corrosion
- CO2 and H2S corrosion
- Corrosion inhibitor guidelines
- Operation, Inspection and Maintenance Monitoring and Inspection of Coatings
- Determining the effectiveness of corrosion control
- Pipelines Safety Record
- Pipeline Integrity Management
- Risk Based Inspection

AUDIENCE

Pipeline Operation and Maintenance Engineer, Facilities Engineer, Facilities Operators.

PREREQUISITE

None.

Metering/Measurements and Production Test

Foundation – 5 Days

The training is designed to provide the attendees the correct procedures for production well test and hydrocarbon sampling, as well as the measurements principles of the main variables in the production system, common equipments, its function, parts and measuring criteria.

COURSE CONTENT

- Flow metering applications
- Flow metering fundamentals
- Differential pressure
- Flow Measurements
- Orifice plates
- Turbine meters
- Ultrasonic meters
- Deposition mechanisms
- Cariolis meters

- Flow rate considerations
- API manual
- Level Instruments
- Fundamentals
- Potentiometric
- Based on electrical parameters measurement
- Based on density measurement
- Factors Affecting Measurements
- Multiphase measurements
- Conventional system
- In line meters
- Gas/Liquid ratio
- Vibration tube
- Neutron Interrogation
- Production Process
- General Description of well test process
- Oil Volume
- Gas Volume
- Water Volume
- Pressure Data Activities in the well
- Physical condition of the wellhead
- Types of flow station
- Physical condition of Flow station
- Process to pass the well for test
- Process to restore the test for production after test
- Fluids measurements at the flow station
- Liquid Measurements

AUDIENCE

This course is intended for individuals working as production and surface facility engineers to increase the understanding of the production fluids properties and measurement principles.

PREREQUISITE

None.

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
- Macro vision of the Functions Macro in the plant shutdown Planning
- 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.

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.

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.

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
- 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.

Maintenance Management and Control Indicators

Skill – 5 Days

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.

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 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.

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
- 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 Recommendations and reporting
- Risk Assessment measurement
- HAZOP study cases

AUDIENCE

Surface facilities production operators and technicians, production supervisors, electrical, mechanical and instrumentation and control technicians.

PREREQUISITE

Basic knowledge of the surface facility production system.

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

AUDIENCE

Engineers wanting a better understanding of corrosion and its management in oil and gas production systems.

PREREQUISITE

Basic knowledge of corrosion and production systems.

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

Surface Facility Production Operations course.

Failure Mode Effect Analysis Applied to Production Operations

Skill – 5 Days

Failure mode and effects analysis (FMEA) is used to assess the potential for equipment failures and problematic events in a process and to qualify their effects. Course emphasis is on the practical aspects of the techniques for optimization of production operations. Attendees will learn the theoretical and practical aspects of FMEA, criticality, analysis, root-case analysis, risk-based inspection, and decision-making analysis for production operation activities.

COURSE CONTENT

- Failure Mode Effect Analysis (FMEA) overview
- Criticality analysis
- Qualitative models
- Semi-quantitative models
- FMEA: Types of analysis, functional approach, applications
- Classification of the failures
- Application of FMEA to subsurface-surface systems
- Root-cause analysis
- Risk-based inspection
- Reliability, availability, and maintainability analysis

AUDIENCE

Surface facilities engineers, production engineers and managers, and maintenance and reliability engineers.

PREREQUISITE

Basic knowledge of reliability engineering and oil and gas 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 optimizatios
- Automated well tests
- Bottomhole sensors and intelligent wells
- Improvement on Differed production
- Production optimization in line
- 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.

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.

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 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

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. Knowledge of oil and gas production operation is useful but not required.

OLGA Flow Assurance (3 days)

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.

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, 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 OLGA software is necessary, but a general knowledge of pipe flow and thermodynamics is an advantage.

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.

OLGA Flow Assurance (5 days)

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.

Avocet for Administrators I

Skill – 3 Days

The Avocet Administration I course provides a basic understanding of Avocet* architectural components, with emphasis on data integration for both low and high frequency data. This course explains the administration tasks required to setup and run Avocet software. It covers installation and data loading. Additionally, you will learn about Avocet configuration, language support, units, and security.

COURSE CONTENT

- Understand the architectural components
- Introduction to Avocet Web Service
- Configuration of Avocet Mobile Capture app
- Install Avocet – both the low and high frequency elements
- Work with the major configuration files
- Set up language support, units and security
- Run maintenance processes
- Review Avocet's data modelling
- Load data and create reports
- Learn how to integrate an extension

AUDIENCE

People responsible to install, deploy, and configure Avocet and its extensions.

PREREQUISITE

Prior knowledge of Avocet would be useful, but is not required.

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 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

Skill – 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

Production engineers, facilities engineers field production operations engineers.

PREREQUISITE

General petroleum engineering knowledge as well as elemental software skills.

PVT For Flow Assurance And Production Engineering Applications

Skill –5 Days

The key for flow assurance modeling in PIPESIM and OLGA is through proper fluid modeling. This course gives a comprehensive overview of EOS fluid modeling for systems where solids may form. Procedures for matching EOS model to lab experiments are covered as well as the procedure to export black oil or compositional files for production simulators like PIPESIM and OLGA.

COURSE CONTENT

- PVT sampling techniques
- Compositional analysis
- PVT experiments and PVT reports
- Quality control of fluid compositions
- EOS modeling of petroleum fluids
- C7+ characterization and lumping
- Viscosity tuning
- Multiple fluid EOS modeling
- Modeling of Polar components: water and salts
- Hydrates
- Hydrate inhibitors
- Asphaltenes
- Wax

AUDIENCE

Who wants to expand their knowledge in PVT fluid modeling for OLGA or PIPESIM applications.

PREREQUISITE

Attendees need a working knowledge of the basic OLGA or PIPESIM.

Avocet Mobile Data Capture

Skill –1 Days

This course provides an understanding of how to deploy the Avocet* Mobile Data Capture app. It explains the elements of the Avocet architectural components and configurations. It also shows you the process of creating a web environment for the Avocet Mobile Data Capture app. Finally, through a series of hands-on activities, you will discover the intuitive mobile interface of the Avocet Mobile Data Capture app. You will work through simple to complex workflows that illustrate the process of collecting and monitoring valuable field data.

COURSE CONTENT

- Understand Avocet architectural components
- Introduction to Avocet Web Service
- Configuration of Avocet Mobile Capture app

AUDIENCE

People responsible to install, deploy, and configure Avocet and its extensions.

PREREQUISITE

Prior knowledge of Avocet would be useful, but is not required.

Avocet Administration II

Advanced – 2 Days

This course provides a deep understanding of Avocet 2014 architectural components with emphasis on extensibility of the data model and database schema. You will learn about features of the oil and gas Avocet layers, extensibility of the data model, extensibility of the database schema, transaction rollup, customized report with reporting services, and configuration of analystics. Avocet courses are customized, so length of training varies. This course can also be customized to include training on additional Avocet topics.

COURSE CONTENT

- Web client,
- ClickOnce deployments,
- SQL server reporting services,
- Data cube for analytics
- Explore the use of the application server to distribute a processing load
- Explore the features associated with oil and gas layers
- Explore the data exchange utility and build a simple data exchange that works from a SQLite database like Prosource or Seabed.

AUDIENCE

Anyone interest to install, deploy, and configure Avocet and its extensions.

PREREQUISITE

Avocet users who have attended the Avocet administration I.

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
- 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 Workshop

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.

Pipeline and Gathering System: Theory and Applications

Foundation – 5 Days

This course covers the configuration of manifold and gathering network, as a starter of the surface facilities. Based on this, pressure drops, fluid pattern and the network arrangement are discussed in detail. At the end of the gathering network simulator (Pipesim) is used to obtain the best operating and designing conditions for the system.

COURSE CONTENT

- Pre-Assessment
- Oil and gas production system (wellhead-gathering-phase separation)
- Production pressure profile (reservoir-tubing-flowline-production separator)
- Basic concepts of fluid flow.
- Two phase (gas-liquid)
- Correlations for pressure drop calculations in horizontal pipelines
- Gathering Systems
- Pipeline fundamentals (Outside Diameter, Inside Diameter, Thickness, Schedule, material, pipe properties tables)
- Onshore and offshore production manifolds
- Gathering and Distribution Systems Design Criteria's
- Design Practices for oil and gas gathering systems
- Backpressure, pressure drop and Erosion velocities criteria
- Manifold Location Studies (Interferences and minimum Pipeline cost)
- Erosion velocities calculations
- Simple Flow in pipeline using Pipesim
- Multiphase flow calculation using Pipesim
- Size tieback and risers using Pipesim
- Simple network model on the GIS map
- Collect and display elevation data for pipeline using GIS maps
- Building Pipesim models exercises

AUDIENCE

Surface Facilities Engineers, Production Operation Engineers.

PREREQUISITE

None.

Practical Flow Assurance Using Transient OLGA Simulation

Skill – 5 Days

This course: Introduce key impediments to flow, including slugging and precipitation of organic and inorganic solids, with examples from various challenging environments. Review technologies for capturing fluid samples and characterizing their PVT properties; Define current measurement and modeling approaches for characterizing production-chemistry impediments, such as asphaltenes, paraffin waxes, hydrates and inorganic scales. Basic multiphase production hydraulics and thermal issues; Introduction to OLGA topology and basic assumptions; Introduction and demonstration of a leading fluid modelling software. Terrain slugging mitigation, hydrodynamic slugging and OLGA Slugtracking.

COURSE CONTENT

- Introduction and PVT Characterization
- Laboratory Solids Characterization
- Integration Concepts and Field Example of Management Approaches
- Multiphase Flow Modeling
- Transient Simulation and Field Examples

AUDIENCE

This course is intended for engineers and chemists in the upstream and downstream segments of the petroleum industry.

PREREQUISITE

None.

Production Chemistry

Foundation – 5 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
  - 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

AUDIENCE

Production chemistry engineers, production operation engineers, surface facilities production engineers, flow assurance engineers.

PREREQUISITE

Basic understanding of the oil and gas production system.

Information Management

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 .

SOFTWARE

COMPETENCY LEVEL	Corporate Data Management & Integration	Project Data Management	Data Quality Management	Unstructured Information Management	Studio	Techlog
ADVANCED	ProSource Front Office Administration			eSearch Administration		
	ProSource Framework Advanced					
	ProSource Logs Advanced					
	ProSource Enterprise Advanced					
	ProSource Seismic Advanced					
SKILL			InnerLogix DQM Intermediate	eSearch Intermediate		
	ProSource Front Office Fundamentals	Studio Manager: SQL Server Environment			Studio Manager: SQL Server Environment	
	ProSource Logs Fundamentals	Studio Manager: Oracle Environment			Studio Manager: Oracle Environment	
	ProSource Seismic Fundamentals	Studio Manager - Techlog			Studio Manager - Techlog	
	ProSource Enterprise Fundamentals	Studio Manager - Petrel			Studio Manager - Petrel	
FOUNDATION	ProSource Framework Fundamentals	ProSource Petrel and Results Fundamentals		eSearch Fundamentals	Studio for Techlog Users	
		Studio for Petrel Users				
	Introduction to Information Management in the Petroleum Industry				Studio for Petrel Users	
AWARENESS			InnerLogix DQM Solution Workshop			

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.

ProSource Framework Fundamentals

Foundation – 2 Days

The ProSource data management and delivery system provides a single tool for browsing, editing, creating, and managing information from multiple distributed repositories. This course is recommended as the first step in learning the ProSource information management system and associated products. Instruction covers the fundamental workflows supported by the ProSource system. The ProSource system interface and the workflows covered are common to the suite of ProSource system products. The training guides the attendees through the use of this software so that they can quickly and efficiently manage data and understand the architecture supporting the application.

COURSE CONTENT

- ProSource system architecture and integration strategy
- Using the tree folder structure to access data using queries
- Searching for specific data using constraints
- Accessing spatial data and related information with the map
- Accessing underlying data sources to view and edit data
- Analyzing results with the data viewers
- Performing and managing data transfers using the Data Transfer Manager

AUDIENCE

Data management professionals with limited or no experience using ProSource system software who require a basic understanding of the interface and workflows.

PREREQUISITE

None.

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
- Attaching documents and reports to study containers
- Archiving file-based project files and unstructured data
- Basic concepts of ProSource Petrel extension
- 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
- 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 Techlog Users

Foundation – 2 Day

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major

productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together.

COURSE CONTENT

- Overview and basic concepts
- Techlog and the Studio environment
- Data transfer
- Team collaboration
- Manage your data

AUDIENCE

Information Management Professionals, Petrophysicists, Geologists, Geomechanics Professionals, Drilling Engineers, Reservoir Engineers, Geophysicists, Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

Studio for Petrel Users

Foundation – 1 Day

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
  - Information
  - Knowledge
  - Wisdom
- Module 2: Data
  - Oilfield life cycle
  - Data types and categories
  - Structured and Unstructured
  - Data life cycle
  - Security
- Module 3: Information
  - Project versus corporate versus operational
  - Context and organization
- 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.

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/DLIS)
- 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

General understanding of data delivery and data flow processes required to perform petroleum subsurface interpretation studies.

Studio Manager: SQL Server Environment

Skill – 4 Days

Studio Manager allows data managers to effectively support and manage their Petrel users. It provides applications that allow you to administer, browse, correct, and organize E&P data. Data managers can quickly evaluate the state of their Studio environment—to determine the status of various repositories, review recent user activity, and identify and complete critical data-management tasks. High-level information enables quick access to key indicators and intelligence on the repository you are connected to.

COURSE CONTENT

- Introduction to Studio and Studio Manager
- Create repositories, users, roles, create data environments, manage indexes, quality tags, coordinate 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.
- Identify data issues, manage user attributes, manage global well logs, and find and correct data.
- Make repository copies, snapshots, backup and recovery. Review application logs
- Overview of Studio database installation, uninstallation, upgrade and index migration.

AUDIENCE

Data Managers or Data Administrators and Petrel users with data management responsibilities.

PREREQUISITE

Petrel Fundamentals, 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.

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.

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.

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
- 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.
- Transfer data to Petrel and Techlog using the associated ProSource Front Office plug-in
- Log data and associated documents data submission from ProSource Front Office to ProSource Logs

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.

PREREQUISITE

ProSource Framework Fundamentals course or working knowledge of ProSource software.

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.

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.

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.

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 and 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 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 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 - Techlog

Skill – 1 Days

Studio Manager comprises a suite of tools for effectively managing the Studio environment. It consolidates administrative and core data management workflows supporting Techlog. 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 Database installation overview
- Administration of repositories, users, projects spaces, and roles
- Data transfers between Techlog and Studio
- Match rules
- Identification of data transfer issues

AUDIENCE

Data managers or data administrators and Techlog users with data management responsibilities.

PREREQUISITE

Techlog Fundamentals course, or be familiar with Techlog.

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
- Match 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.

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.

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

Professionals who participate in IT Software Application and Database Management, Database Administrators, Data Managers.

PREREQUISITE

eSearch Fundamentals course.

ProSource Framework Advanced

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 knowledge of ProSource system software, and an understanding of UNIX systems administration, Apache, Tomcat, and SQL applications.

ProSource Logs Advanced

Advanced – 3 Days

This course provides attendees with details and an understanding of the tasks required to administer and configure the ProSource Logs. The course details the procedures needed to administer and create various Seabed E&P open data model and database accounts, control data access (entitlements) to different groups of users, synchronize existing projects, configure default values for data loader and exporter, configure multiple storage directories to eliminate disk space issues during data loading, and configure miscellaneous parameters like reports, job scheduler, etc. This course will help attendees design advanced data loading and validation workflows for well log data manipulation needs.

COURSE CONTENT

- Outline Seabed database administration, including creation of projects, dictionaries, interfaces, and staging areas (temporary areas used during data loading)
- Configure access to distributed installations (ProSource system/Seabed database) by means of a single ProSource application interface
- Describe various roles that control data access and validation
- Outline utilities and configurations required to control data access to various user groups (entitlements) and to synchronize projects (Data Copy/Update)
- Describe associate documents (e.g., core images, survey reports) with additional nodes in the ProSource tree (e.g., VSP survey, data files)
- Configure default rules to maintain database integrity during loading
- Manage default properties for loading and exporting industry standard well log formats (DLIS, LIS, LAS)

AUDIENCE

This course is intended for petrotechnical data administrators, data loaders, data managers, and any other data management professionals.

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.

Electrical 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 .

DOMAIN

COMPETENCY LEVEL	Electrical Installation	Power Generation and Distribution	Primemovers and Drivers
SKILL	Cathodic Protection	Power Generation Systems and Equipment	Electrical Pumps, Motors, and MCC
	Lighting and Small Power	Low Voltage Distribution Systems and Equipment	
	Electrical - Fault Finding and Troubleshooting	High Voltage Distribution Systems and Equipment	
	Hazardous Areas Classification and Installation	Electrical Transformers	
	Electrical Authorisation	Power Quality and Management	
	Earthing Systems (Electrical Grounding Systems)	Uninterruptable Power Supplies (UPS) and Battery Banks	
	Electrical Protection Systems and Equipment		
FOUNDATION	Introduction to Oil Field Surface Facilities Operations with Simulator		

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. Participates 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
  - Lighting in hazardous areas

- Single-phase motors

- Heat tracing and remote power systems
  - Electric heat tracing
  - Power outlets
  - AC systems
  - PV systems
  - TEG 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.

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) 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 exercise 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.

High Voltage Distribution Systems and Equipment

Skill –3 Days

A properly designed, operated and maintained electrical distribution system is a vital element in safety and reliability of an electrical system in an industrial plant. his course has been designed to provide participants with an understanding of the layout of high voltage distribution systems found in an industrial settings typically defined as (5kV to 35kV). Topics covered include basic distribution system designs, typical equipment used as well the basic maintenance activities associated with this equipment. Participants will gain and understanding of the main safety issues associated with high voltage distribution system.

COURSE CONTENT

Single line diagrams

Distribution system designs

Fault levels

System grounding

Metal clad switchgear

Gas insulated switchgear

Circuit breakers

Transformers

Power fuses and cables

Safety grounding

Arc flash safety

Distribution system maintenance

AUDIENCE

This course is designed for electrical technicians, maintenance planners, and supervisors with operation and maintenance responsibilities who work in an industrial plant.

PREREQUISITE

Anyone taking this course should familiar 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)
  - 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.

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 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.

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 of the principles related to grounding systems within the oil and gas industry.

COURSE CONTENT

- Basic grounding
  - Safety grounding
  - System grounding
  - Lightening 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
  - Intertripping 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

AUDIENCE

This class is aimed at entry level of 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  .

DOMAIN

COMPETENCY LEVEL	Process Measurement	Telecommunications Systems	ESD and PSD Systems	Instrumentation Equipment & Installations	Control Systems
SKILL	Process Measurement	Communication Systems	Safety Instrumented Systems (SIS)	Hazardous Areas Classification and Installation	Subsea Control Systems
	Process Control	Information Security for Industrial Systems	Fire and Gas System	Control System Cabling	Hydraulic Control Panel
	Process Analyzers			Instrument Calibration and Verification	Final Control Elements
	Fiscal Metering				Distributed Control Systems (DCS)
					Supervisory Control and Data Acquisition (SCADA) System
					Programmable Logic Controller (PLC)
					Instrument Fieldbus Control
FOUNDATION	Introduction to Oil Field Surface Facilities Operations with Simulator 				

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
  - Transmitter and receiver operation
  - Radio frequency bands
  - Computer and internet systems
  - Satellite communication/telecommunication regulation
- Telecommunication procedures
  - Duties of the radio operator
  - Handheld radio telecommunications
  - Telecommunication protocols
  - Emergency telecommunications

AUDIENCE

Anyone in the oil & gas industry.

PREREQUISITE

Some exposure to oil and gas facility terminology.

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

- SIS checklist
- Managing the SIS

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.

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 an 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 advances 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

- 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

- 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 controls 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 (WV). 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.

This 3-day course covers the purpose of analyzer systems, how they are selected, and their installation and maintenance. Participants will learn about how a sample is conditioned so that the analyzer will give a representative reading of the component that is of interest in the process. The course will also cover the main types of analyzers that are commonly used in industry. Upon completion of this course, participants will better understand the operation of a process analyzer.

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

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.

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.

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
  - Pressure meters
  - Temperature meters
  - Flow computers
- Fiscal metering analyzers
  - Fiscal metering analyzers
  - Meter provers
  - Operating procedures

AUDIENC

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 it 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.

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 operators 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.

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

- Foundation fieldbus systems
  - Introduction
  - Benefits of foundation fieldbus
  - Configuration
  - Operation
  - Maintenance and troubleshooting
- Foundation 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.

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

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

COMPETENCY LEVEL	Static Equipment	Rotating Equipment	Prime Movers and Drivers	Piping and Pipelines	Utilities
SKILL	Heat Exchangers	Positive Displacement Pumps	Turbines (Gas/Steam)	Plant piping	Heating, Ventilation, and Air Conditioning (HVAC) System
	Pressure Vessels	Positive Displacement Compressors		Pipeline	
		Centrifugal Compressors		Valve Maintenance and Repair	
		Centrifugal Pumps			
		Machinery Diagnostics and Analysis			
	Maintenance, Testing, and Diagnostics				
FOUNDATION	Introduction to Oil Field Surface Facilities Operations with Simulator				

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.

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
- 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.

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.

PREREQUISITE

Awareness training in a mechanical or technical environment.

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.

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
- 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

Dynamic pumps course is not necessary, but recommended.

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
- Joining methods
- Maintenance and repair
- Types of control valves
- Construction and operation
- Care and maintenance

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.

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.

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
  - Spectromic 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

- 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.

Process 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 .

DOMAIN

Utility and Water Injection Systems	Oil Systems	Gas Systems	Wellheads and ESPs	Control Room and Laboratory	COMPETENCY LEVEL
Power Generation System	Oil Export Systems Operations	Two Phase Separation	Subsea Wellhead Systems	Control Room Operations	
Heat Transfer Equipment	Production and Test Separation Systems	Gas Metering System	Surface Wellhead System	Safety Shutdown Systems	
Fire Water Systems	Chemical Treatment	Gas Sweetening	Electrical Submersible Pumps (ESPs)	Fire and Gas System	
Instrument, Utility Air and Nitrogen Systems	Crude Oil Storage Tanks	Gas Compression and Dehydration System		Water, Oil, and Gas Sampling and Analysis	
Drain Systems	Oil Desalting System	Gas Lift Systems			
Cooling Water Systems	Pigging Process				
Potable Water Systems	Oil Stabilization				**SKILL**
Flare Systems	Oil Fiscal Metering				
Fuel Gas System					
Steam and Condensate System					
Sewage System					
Seawater Lift and Circulation System					
Heating, Ventilation and Air Conditioning (HVAC) System Operation					
Water Treatment and Injection System					
Introduction to Oil Field Surface Facilities Operations with Simulator					**FOUNDATION**

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, 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.

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, instrumentation personnel, and safety and maintenance personnel.

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
- Alarm management, interpretation, and response
- Emergency shutdown, blow-down, fire and gas detection systems
- Generic emergency response role and responsibilities

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.

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 other. 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
- 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
- Failure modes

- Redundancy (TMR)
- Resetting testing and bypassing
- Documentation and cause-and-effect drawings

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.

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 technicians, process technologists, and safety personnel; employees working with equipment and materials purchasing, equipment procurement, and job planning; immediate supervisors to working technicians.

PREREQUISITE

Exposure to oil and gas facility terminology.

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, 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 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.

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.

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.

Fire and Gas System

Skill – 2 Days

This 2-day course has been designed to provide participants with an understanding of the operation and basic hardware associated with fire and gas systems. The attributes and characteristics of toxic gases and how they behave when they are released in an uncontrolled manner will be covered. Participants will gain a basic understanding of the use of the fire and gas system. They will also be exposed to the structure of the system and how each part is connected to protect the plant and personnel. After completing this course, participants will have a better understanding of how the system is programmed and how signals are generated to trigger shutdown action.

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
- Cause-and-effect drawings
- Local VDU panel and fire and gas P&IDs

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 working technicians.

PREREQUISITE

Exposure to fire and gas system terminology in the oil and gas industry.

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 preventive 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

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.

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

- 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
- 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 the 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

AUDIENCE

Process operators, process technologists, 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

Exposure to oil and gas pigging terminology and activities.

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
- Treatment methods
- Systems
- Plant operation
- Gravity filters
- Reverse osmosis systems
- Metering systems

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 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

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.

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.

PREREQUISITE

Exposure to oil and gas facility terminology.

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.

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.

Fuel Gas System

Skill – 2 Days

Participants in 2-day this course will gain an understanding of fuel gas systems used in oil and gas production facilities. The fuel gas system supplies treated, dry, gaseous fuel for various fired equipment applications within the plant or platform. The gas can come from a natural gas supply line, off gas from various processes, or a blend of both. Attendees will learn specifics of a well-designed fuel gas system and how it should remove the offending contamination, ensuring that it is free of liquid and solids and provides the necessary superheating of the fuel gas. This course will provide participants with an understanding of fuel gas system types, safe operation, monitoring, control, and plant safety management requirements found in the oil and gas industry.

COURSE CONTENT

- Fuel gas operation
- Flow diagrams, P&IDs, and types of fuel gas systems
- Process control and monitoring systems
- Maintenance and inspection
- HSE issues
- H2S, fire, and explosion concerns
- Gas detection and alarms
- Isolation and response systems

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.

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
- 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.

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
- 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.

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

- Water Injection
- Reservoirs, rock properties, and water flooding
- Injection water impurities, treatment, and systems
- Water quality monitoring and control
- Operation of the water injection system
- Well design and construction

- System types, flow diagrams, and P&IDs
- Equipment, components, and normal and emergency operation

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.

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 .

DOMAIN

Leadership	Communications	Human Resources	COMPETENCY LEVEL
Leading Organizational Change in Oil and Gas			ADVANCED
Becoming an Inspirational Leader in Oil and Gas			
Feedback Conversations	International Business Communication Skills	Talent Management and Retention in the Oil and Gas Industry	SKILL
Managing Teams for Success	Negotiation Skills for the Oil and Gas Industry	Managing Performance and Appraisal Reviews	
Performance, Coaching, and Counseling	Influential Conversations		
Mindful Leadership Workshop - Advanced	Powerful Technical Presentations		
Transforming Teams Workshop	High Impact Presentation Skills		
The Wellsite Coach			
Essential Coaching Skills for Managers			
Managing Teams Across Global Boundaries			
Mindful Leadership Workshop - Introduction	Effective Time and Meeting Management		FOUNDATION
Personal Breakthrough Impact			
Navigational Leadership & Influential Conversations			
Building a Culture of Innovation	Difficult Conversations, Productive Conflict, and the Art of Negotiation		
Navigational Leadership	Surviving Office Chaos - Managing Time, Meetings, and Conflict		
First Time Leadership and Supervision	Communication and Conflict Management		

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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.

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.

COURSE CONTENT

- Communication skills
- Components of communication
- Style assessment
- Effective listening, including 2-way communication techniques
- Conflict management
- Assertiveness versus aggressiveness
- Approach for conflict
- Communication techniques for conflict resolution

AUDIENCE

Participants interested in improving their skills in communication and conflict resolution.

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.

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
- Using emotional intelligence to enhance impact
- Using feedback to enhance performance
- Fundamental active-listening techniques and methodologies
- Using high-gain questions to increase performance
- Using negotiations to achieve sustainable results
- Influencing through stakeholder management
- Understanding the impact of stakeholder mapping
- Sphere-of-influence model to understand interdependence
- Navigating organizational cultures and managing conflicts

AUDIENCE

Individual contributors, project members, first-time managers.

PREREQUISITE

At least 3 years of professional experience.

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 build onthe 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.

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

Emerging frontline and senior leaders who want to build effective teams and improve team relationships, productivity, and morale.

PREREQUISITE

None.

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
- 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: A laptop with MS PowerPoint.

PREREQUISITE

None.

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 onthe introductory Mindful Leadership workshop, in which participants began the process of self-awareness leading to a personal leadership vision.

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

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
- Delivery skills
- Presentation
- Verbal skills in technical presentations
- Nonverbal skills during technical presentations
- Handling nervousness effectively
- Appropriate use of humor and stories
- Presentation
- 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.

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
- 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

Leaders at all levels, human resources and training professionals, project and team leaders, and anyone who works with people and who wants to improve at providing constructive feedback.

PREREQUISITE

None.

International Business Communication Skills

Skill – 5 Days

First impressions are important, and often there is limited time to catch and hold the attention of an audience. Therefore, what we say, what we write, and how it is presented can have a significant impact on whether the ideas and proposals are accepted. This 5-day course will help participants achieve their business goals by improving their international business communication and influencing skills. Over half of the course will be dedicated to realistic exercises and role-playing scenarios. This will give participants the opportunity to practice international communication skills and build their confidence.

COURSE CONTENT

- What is communication?
- Critical management competencies
- Principles of effective communication
- Barriers to communication
- Understanding the audience
- Communication in different cultures
- Oral communication principles and skills
- Telephone skills
- Productive business meetings
- Principles of effective writing
- E-mail and letter writing
- Winning proposals
- Effective report writing
- Characteristics of successful presenters
- How to plan, prepare, and practice
- How to handle questions
- How to deliver a presentation
- Dealing with nerves
- Voice control
- Attention grabbers
- Using visual aids
- Managing time
- Using body language

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 CONTENT

- The talent war: getting the best of the best
- Talent management: overview and demographics in the oil and gas industry
- Recruit externally or grow internally
- Talent and high potential: defining the criteria
- Use of psychometric and competency frameworks
- Talent management models, grading, and structures
- Talent gap analysis

- The talent war: developing the best of the best
- Creating the talent pool
- Talent calibration meetings
- Talent development: structures and pipelines
- Managing performance
- Talent career planning
- The talent war: keeping the best of the best
- Organizational capability reviews
- Reward strategies
- Succession planning: ensuring sustainable growth

AUDIENCE

Managers, directors, and human resources professionals who manage or have a vested interest in managing talent within their organization.

PREREQUISITE

None.

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
- Leading and inspiring through change
- Using the force field to understand planned changes
- Tools and techniques used in mastering change
- Developing a personal action plan to implement

AUDIENCE

Middle and senior managers interested in taking their teams to the next level in performance and impact.

PREREQUISITE

Solid grounding in management techniques and skills; 5 to 10 years of professional experience as a senior manager/leader.

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 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 | VIRTUAL CLASSROOM

Business Strategy	Project Management	Contracts and Procurement	COMPETENCY LEVEL
	Deepwater Well Project and Risk Management		ADVANCED
A Strategic Approach to Oil and Gas Exploration	Strategic Project Management		
Portfolio Management	Project Risk Analysis and Management		
International Management Skills	Successful Project Recovery	Technical Bidding and Tendering	SKILL
International Oil and Gas Exploitation Contracts	Applied Project Management - Oil and Gas	Contracts, Procurements, and Partnering	
Petroleum Geopolitics with OilSim	Cost-Benefit Analysis (CBA) of Energy Projects	Supply Chain Strategy	
Negotiation Skills for the Oil and Gas Industry	Risk Management for Projects		
	Advanced Cost Estimating and Control for Projects		
	Ultimate PMP® Prep Boot Camp		
Introduction to Management of E&P Business with OilSim	Practical Project Management in Spanish or Portuguese	Document Management for Oil and Gas Professionals	FOUNDATION
Navigational Playbook and Strategic Planning Workshop	Project Management		
Introduction to Information Management in the Petroleum Industry	Project Management Fundamentals		
	Introduction to Agile Project Management		
	Communication and Presentation Skills for Project Managers		
	Microsoft Project 2013		
	Project Management for Managers		AWARENESS
	Project Management for Team Members		

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

Business and Project Management

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 | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Project Management
AWARENESS	Project Management Awareness (Virtual Instructor)

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
- 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.

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
- Introduction to project 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 alliancing and partnering
- Team building
- Team leadership
- Alliancing 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 Agile Project Management

Foundation – 4 Days

This four (4) day course is designed for project managers with a minimum of three years' experience who would like to learn how about a more adaptive approach at managing projects, resolving issues and delivering value. The course focuses on time-boxed, highly interactive project implementation methodologies known as agile which produces deliverables incrementally from the start of a project, instead of delivering all aspects of the project at the end. Course topics include agile methodologies, practices, tools and techniques.

COURSE CONTENT

- Overview of AgileToday's Environment
- Project Life Cycle - Agile vs Waterfall
- Agile Overview
- DOI – Declaration of Interdependence
- Agile Methodologies
- Exercise – Requirement Game
- Ceremonies (Meeting Types)
- User Stories
- Agile Requirements
- Story writing workshops
- Agile Plans Evolution from Vision to Story

- Sprint Review / Demo
- Retrospectives
- Product Backlog
- Incremental Deliver
- Exercise – Artifacts
- AM – Agile Modeling (AM)
- Agile Games
- Risk-based Spike
- Velocity
- Communication in Agile
- Stakeholder Management
- High Performance Team
- Value Stream Mapping
- Cycle Time
- Quality Standards
- Variance Analysis
- Trend Analysis
- Putting It All Together
- PMI's Code of Ethics and Professional Conduct
- Overview of PMI-ACP Certification

AUDIENCE

New project managers, Project mangers who want to learn more about agile.

PREREQUISITE

None.

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.

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.

Relevant industry case studies and success stories will be reviewed throughout the course. The participants will gain an understanding of asset management throughout the lifecycle, which will be reinforced using oil and gas challenges, practiced via computer simulation.

COURSE CONTENT

- Macro-economics and corporate strategic responses
- Three tests of strategy
- Internal and external factors impacting the value of assets
- Fiscal regimes
- Petroleum systems
- Geophysical methods
- Exploration as a process and successful exploration strategies
- Drilling
- Reserves classification
- Reservoir appraisal
- Field development
- Simulated Challenge 4: Depletion Plan
- Facilities
- Production
- Maximizing value

AUDIENCE

Anyone who desires an increased understanding of the management of upstream oil and gas assets.

PREREQUISITE

None.

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 highlighst 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
- 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
- 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 for Projects

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.

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.

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.

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
- 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.

Cost-Benefit Analysis (CBA) of Energy Projects

Skill – 4 Days

This course helps the energy industry managers and executives to better use the tool commonly referred to as "cost-benefit analysis" or CBA. As a formal assessment of an organization's project costs and benefits, CBA attempts to measure and compare the efficiency of project options. This type of analysis has become standard practice in project analysis and program evaluation—particularly in cases where there are new strategic or capital investments. The goal of the course is to provide the participants with the conceptual foundations and practical skills they will need to be thoughtful consumers and producers of CBA.

COURSE CONTENT

- Introduction to CBA
- Uses of CBA in Planning & Evaluation
- Measures Used in CBA
- Measuring Intangibles
- Basic CBA Process
- As-Is and the To-Be
- Alternative Systems
- Measures in CBA: Return on Investment (ROI)
- Measures in CBA: Internal Rate of Return (IRR)
- Measures in CBA: Net Present Value (NPV)
- Measures in CBA: Benefits Cost Ratio (BCR)
- Benchmarking Measures in CBA
- Sensitivity Analysis
- Risk and Uncertainty in CBA
- Writing the CBA Report
- Direct Versus Indirect Costs
- Future Costs
- Discounting
- Best Practices in CBA

AUDIENCE

This course is intended for employees who are in a management, technical or executive position with an energy company.

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 (SOW): 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 SOW and the strategy
- Did the strategy work?
- Postcontract reviews, appraisal, and lessons learned

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

- 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.

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.

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
- 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
- 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.

COURSE CONTENT

- The project and contracting context
- Alliancing and partnering
- The tender process
- The contract
- Contract structure

- Effective contract negotiation
- Supply chain management
- 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
- 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
- Bid compilation
- Presentation

AUDIENCE

Any professionals involved in bidding for, contracting for, or managing capital projects.

PREREQUISITE

None.

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-NXT13150); job experience in both economics and risk is preferred, as well as experience with the Merak software; job experience can substitute for training courses.

Project Risk Analysis and Management

Advanced – 4 Days

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.

COURSE CONTENT

- Risk analysis and management part 1: introduction
- Risk analysis and management part 2: processes
- Identification and documentation of risks
- Assess exposure
- Develop risk responses: mitigation
- Review documentation
- Risk analysis and management part 3: contingency
- Quantitative risk analysis basics
- Quantitative risk analysis using Excel
- Develop quantitative risk assessments
- Quantitative risk analysis using @Risk
- Case study: quantitative risk of budget
- Teams: RAM requirements (2)
- Overview of @Risk for a project
- Case Study: Using @Risk for Project
- Sensitivity analysis
- Review forecasting, monitoring, and control
- Case Study: P50 and P90 for estimate and schedule
- Teams: RAM requirements (3)
- Case Study: presentation of results
- Teams: RAM requirements (4)

AUDIENCE

Project personnel who require an understanding of how to effectively manage risk on projects.

PREREQUISITE

Understanding of project planning, monitoring, and control; basic comprehension of Microsoft Excel and Project.

A Strategic Approach to Oil and Gas Exploration

Advanced – 4 Days

This 4-Day course will provide knowledge and understanding of the use of strategic planning to optimize chances of success in oil and gas exploration. It will cover recognizing the need for strategic change and how to develop options to respond to changing business environments. It will include implementation of new strategic directions and managing and monitoring performance. The course builds on a number of case studies showing examples of strategic change and what can be learned from these. The scope will include 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). Participants will gain understanding of how to recognize the need for a strategic approach, how to develop a set of strategic options, and how to select and implement the appropriate strategy for a given situation.

COURSE CONTENT

- Supermajor case study
- 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.

Strategic Project Management

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 life cycle
- Project finance review
- Project execution plan
- Project realization
- Stage gate reviews
- Oriole case study 1: feasibility
- Decision support packages
- Qualitative risk review
- 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.

Deepwater Well Project and Risk Management

Advanced – 5 Days

The key objectives for this course are to highlight the critical project and risk management issues involved in a deepwater well project to achieve the project mission: delivering value safely, responsibly and efficiently.

At the end of the course, participants will understand the key issues and principles in deepwater project management, they will develop an understanding of the challenges, choices, and compromises necessary to drill deepwater wells.

They will be able to apply these principles in practice as members of a project team to optimize the management of the well project, and to identify and manage risks to maximize value. Following the deepwater well project management process from prospect evaluation through operations and close out, participants will develop key skills needed to drill wells in a deepwater environment.

COURSE CONTENT

- Deepwater Well Project and Risk Management Principles
- Deepwater challenges: how the deepwater setting offers challenges different from wells onshore or in shallow water.
- Project Management Principles
- Project Management
- The project plan: clarity on mission, objectives, and value
- Time and cost estimation: understanding and reflecting uncertainty in realistic estimates
- Management of Change: the challenge of ensuring value – decisions not decision trees
- Contracting: selecting the right contracting approach for different services and materials
- Supply chain, logistics, and operations base: getting materials and services to the well at the right time cost-effectively
- Financial management: funding and accounting
- Management review: how to ensure that audits and management interface assures safe and responsible delivery of the project mission

- Tracking Progress, Well Planning, and Operations
- Well PM software and Key Performance Indicators (KPIs): monitoring the project using value-focussed KPIs; discussion of PM software, management reports, continuous improvement, benchmarking, technical limit, and KPIs
- Task progress and phase close out: ensuring early identification of potential differences in outturn time or cost to permit value-based decisions
- Well planning - Pre-drill data requirements: the site survey and shallow hazard analysis, and how this sets the stage for success
- Rig selection: on the basis of hull type, station-keeping, generation, market, crew competence, and management system
- Casing programme and the mud density window: how the deepwater setting affects well design and how this is managed
- Operations Management and Risk Management in Action
- Contingency plans: ensuring that these are complete and meaningful
- Emergency response: how this fourth element of process safety is assured.
- Operations management: applying decision-making, technical limit, communications, in the Execute Stage of the project.
- Applying risk management tools: how a variety of tools are used to manage risk throughout the project
- Macondo review: what should we be learning from Macondo? Analysis and key factors for focus
- Project success factors: sources of value, development skills, key factors in successful projects
- Human factors in well projects: understanding how human factors are key in both driving success in the project, and in managing risk, in planning, execution, and learning
- Final exercise: creating a springboard for continued application of project & risk management principles in future projects.

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 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 awarnes and introduction to Project Mangement concepts. The course provides a good basis for any person seeking future career advancement as a Team Lead or with addtional 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 Initiatie Project Management Overview & Project Initiatie
- 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 Managemen
- Project Execution (Monitoring & Control) & Project Close
- Quality Management
- De-mobilizing projects
- Lessons Learned

AUDIENCE

Project team members who are seeking to take more project responsibities as Team Leads or project coordinators.

PREREQUISITE

None.

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 .

DOMAIN | SOFTWARE | VIRTUAL CLASSROOM

Petroleum Economics	Risk and Uncertainty	Accounting and Finance	COMPETENCY LEVEL
Portfolio Management			ADVANCED
Data Room Management and Rapid Asset Evaluation			
Economics of Deepwater Projects		Auditing in the Oil and Gas Industry	SKILL
Economics of Unconventional Resources	International Oil and Gas Exploitation Contracts	Exploration and Production Accounting - Level 3	
Economics of Petroleum Exploration	Risk, Uncertainty, and Decisions in E&P Projects	Exploration and Production Accounting - Level 2	
Petroleum Economics - Heriot-Watt University Program			FOUNDATION
Petroleum Economics	Introduction to Management of E&P Business with OilSim	Exploration and Production Accounting - Level 1	
Petroleum Economics On-Line	Petroleum Decision and Risk Analysis	Mastering Finance for Non-Financial Oil and Gas Personnel	
Introduction to Petroleum Economics			AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | SOFTWARE | VIRTUAL CLASSROOM

COMPETENCY LEVEL	Merak	GEOX
ADVANCED		GeoX Advanced Prospect Assessment
SKILL	Merak Capital Planning Fundamentals	GeoX Reserve Tracker
	Merak Peep Fiscal Model Library Fundamentals	
	Merak Peep Advanced	
FOUNDATION	Merak VOLTS Reserves Management Fundamentals	
	Merak Decision Tool Kit	
	Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course	
	Merak Peep Decline Analysis	
AWARENESS	Merak Fundamentals of Petroleum Economics	
	Merak Peep Fundamentals	

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 material, 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.

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.

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.

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.

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

Anyone wanting a better understanding of finance and budgeting.

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 requiring a fundamental knowledge of petroleum economics and oil and gas project recommendations.

PREREQUISITE

Intermediate knowledge of Excel.

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
- 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

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 topic areas. 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 finance function; 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.

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
- Economic drivers of risk
- Risk mitigation
- Decision making under uncertainty

AUDIENCE

Individuals who seek to better understand the subject but are not registered for the degree course.

PREREQUISITE

None.

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 difference 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

AUDIENCE

Anyone who needs an understanding of the economics of petroleum exploration.

PREREQUISITE

A basic knowledge of petroleum geology and petroleum systems.

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
- Geostatistics: Stationary assumptions, variograms, kriging, cokriging, filtering, and multiple realizations

AUDIENCE

E&P professionals involved in data analysis and interpretation, including geologists, geophysicists, and reservoir engineers active in exploration, appraisal, field development, reserves estimation, or economics; decision makers interested in learning more about decision analysis.

PREREQUISITE

Exposure to basic statistics and a working knowledge of Microsoft Excel worksheets.

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
- Materials and inventory accounting
- Cost control
- Departmental and corporate budgets

AUDIENCE

E&P accounting professionals wanting to gain advanced skills.

PREREQUISITE

Exploration and Production Accounting - Level 1.

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.

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.

Exploration and Production Accounting - Level 3

Skill – 5 Days

This highly interactive 5-Day workshop is for attendees who want to take their E&P accounting skills to an advanced level. The course focuses on highly realistic E&P company scenarios and a computer-based simulation to plan, record, and report company progress through international E&P activities. Teams participate in the financial management of these activities, including operator and nonoperator accounting, recording of transactions, updating of financial statements, and analysis of company performance.

COURSE CONTENT

- Review budgets, enter billings into accounting system, and prepare financial statements for new exploration joint venture
- Account for development costs; sales revenues; depletion, depreciation, and amortization (DD&A); a decommissioning provision; and production under terms of tax-based fiscal arrangement
- Prepare cash calls and billings, and maintain operator accounting records for your company as an operator of a new venture
- Prepare financial statements reflecting the change in accounting policy from full cost to the successful efforts method
- Account for company participation in a new venture under a production-sharing contract
- Perform a test and account for the result of falling oil price on reserves
- Adjust company portfolio of assets for a farmout
- Prepare a briefing for your CEO's meeting with investment analysts on company performance and financial status

AUDIENCE

Professionals wanting advanced skills in E&P accounting.

PREREQUISITE

Exploration and Production Accounting – Level 1 and Level 2 courses, and experience working with spreadsheet techniques; participants must furnish their own computers preinstalled with Microsoft Excel software.

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 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, ensure 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
- 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-NXT13150); 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 requiered 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 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
- 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 Decision Tool Kit

Foundation – 1 Day

In this 1-Day course, you learn how to use the Merak Decision Tool Kit components to create tornado diagrams and build a decision tree for a new drilling program. You analyze the risk exposure at the asset and corporate level, as well as assess the value of investments.

COURSE CONTENT

- Overview of the decision analysis process
- Use tornado charts and the Merak Peep application to build a decision tree
- Model simple decisions
- Create complex decision trees
- Explore dependent probabilities
- Learn about the value of information

AUDIENCE

Anyone seeking to learn effective use of the Merak Decision Tool Kit software.

PREREQUISITE

Merak Peep Fundamentals and an understanding of basic risk analysis concepts such as sensitivity analysis and expected value.

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

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 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.

GeoX Resource Tracker

Skill – 2 Day

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 Resource 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

A working knowledge of reserve management. Previous experience with GeoX is an advantage, but not required GeoX Prospect Assessment Fundamentals (PACA).

GeoX Advanced Prospect 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
- 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 Fundamental course.

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.

DOMAIN

COMPETENCY LEVEL	Geology	Geophysics	Software / Other
ADVANCED	A Strategic Approach to Oil and Gas Exploration		
	Petroleum Systems and Exploration and Development Geochemistry		
SKILL	Subsurface Facies Analysis - Integrating Borehole Images & Well Logs with Petrophysical and Seismic Data to Develop Geologic Models		
	Practical Fracture Analysis of Clastic Reservoirs with Petrel - Casper, Wyoming	Practical Seismic Attributes with Petrel	Techlog Formation Evaluation
	Fluvial and Deltaic Architecture and Advanced Modeling using Petrel - Utah / Colorado, USA	Practical AVO and Seismic Inversion with Petrel	Petrophysics, Quick Look and Log Quality Control
	Petrel Petroleum System-based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows using Petrel Exploration Geology Software	Practical Depth Conversion with Petrel	Petrel Velocity Modeling
	Structural Geology and Tectonics		Petrel Introduction to Structural & Fault Analysis Module (RDR)
	Sequence Stratigraphy: Principles and Applications		
	Mapping the Subsurface with Petrel		Economics of Petroleum Exploration
FOUNDATION	Petroleum Geology		Prospect Evaluation, Risks, and Volumes
	Global Tectonics and Geological Prospecting Tools for Exploration	Seismic Processing for Interpreters and Others	
	Introduction to Biostratigraphy		PetroMod Fundamentals
	Geology of Clastic Reservoirs		

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.

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
  - 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
  - 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
  - Analyzing results (output modules) and calibrating results

AUDIENCE

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

PREREQUISITE

None.

Global Tectonics and Geological Prospecting Tools for Exploration

Foundation – 5 Days

A combination of lectures and hands-on practical exercises will introduce attendees to the fundamentals of an effective petroleum system. Emphasis is on global tectonics and how basins are formed, filled, and deformed as well as use of key geologic prospecting tools. Although the course focus is on clastic rocks,

especially turbidites, it also reviews carbonate rocks and evaporite formations. The Atlantic Margin basin is the source for discussions of petroleum system elements. Attendees will be introduced to key aspects of source rock, migration, overburden rock, reservoir characteristics, seal rock, traps, timing, and preservation elements, in addition to learning the fundamental tools for exploration petrophysics.
The course will also cover correlating different well logs that show faults and stratigraphic variation and creating contour maps and learn to present faults in map view.

COURSE CONTENT

- Five laws of geology
- Basin formation, plate tectonics, and source rocks
- Unconventional petroleum systems
- Evaporate and carbonate petroleum systems
- Fluvial, deltaic, and turbidite deposits
- Migration
- Basin filling and deformation
- Faulting as pathways and seals
- Structural traps
- Deformation, sutures and inclusions, rubble zones, and imaging below salt
- Petrophysics for exploration

AUDIENCE

Exploration geoscientists and managers who want a fundamental understanding of petroleum systems and key geologic prospecting techniques.

PREREQUISITE

Basic petroleum geology, and knowledge of petroleum systems.

Seismic Processing for Interpreters and Others

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

- Zero-offset reflection coefficients and reflection coefficients'' amplitude dependence with offset
- Simple imaging using zero-offset data, with the use of the NMO equation and Dix interval velocities
- Concept of 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
- Normal moveout correction and stack to convert data to zero offset
- Estimation of stacking velocities
- NMO and stack's failures
- Kirchhoff before-stack migration
- Three imaging conditions and before-stack, wave-equation migration algorithms
- Anisotropic migration
- Velocity analysis for depth migration, including tomography with attention to salt-related velocity analysis
- Full-waveform inversion
- Simplistic time migration
- Extended imaging condition and migration velocity analysis
- Multiple attenuation and role of wide-azimuth acquisition geometry in multiple attenuation
- Dipping multiples
- Statics, land and marine
- Amplitude corrections
- 1-D and 2-D filtering, including f-k filtering
- Wavelets and deconvolution
- 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

Basic knowledge of geology.

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.

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.

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.

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.

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.
- 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

Basic Knowledge of Geology & Geophysics.

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.

Petrel Petroleum System-based Play-to-Prospect Exploration: Integrated Exploration Techniques and Workflows using Petrel Exploration Geology Software

Skill – 5 Days

This 5-Day course covers the fundamentals of petroleum systems and play concepts. These fundamentals will be integrated into a series of exercises that demonstrate 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.

AUDIENCE

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

PREREQUISITE

Petrel Software Fundamentals.

Practical Depth Conversion with Petrel

Skill – 5 Days

Depth conversion (domain conversion) of seismic time interpretations and data is a basic skill set for interpreters. However, there is no single methodology that is optimal for all cases since the available seismic and geologic control varies in quantity and quality within each project. To design an effective approach to depth conversion, the first part of this course prioritizes understanding the nature of velocity fields and practical approaches to velocity representation. Next, appropriate depth-conversion methods are presented in case history and exercise form. Single-layer and more sophisticated multi-layer approaches are reviewed, along with depth-error analysis and the impact on formation top prognoses and volumetrics.

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.

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.

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
- 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.

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 mimimum 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 models compatible (if correctly up-scaled) to dynamic reservoir models obtained from reservoir engineering measurements and computations.

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.
- Exercise - AVO Attributes
- Inversion Theory and Methods
- Exercise - Post-stack simultaneous inversion
- Well to seismic ties and wavelets
- Exercise - Seismic Well Tie
- Low frequency model building
- Exercise - Low frequency model building
- Practical applications of seismic inversion - including lithology discrimination and rock physics inversion.
- Exercise - Pre-stack seismic inversion
- 4D and 3C Inversion
- Exercise - Using Inversion Results
- Stochastic Inversion
- Future directions

AUDIENCE

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

PREREQUISITE

Practical knowledge of Petrel software is recommended, but not essential. Basic Knowledge of applied geophysical principles and seismic interpretation.

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 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
- 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 porositiesBasics 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

- 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. This course will also be particularly useful to all new hires who will be working in upstream domains.

PREREQUISITE

None.

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 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.

Practical Seismic Attributes with Petrel

Skill – 3 Days

This course will outline the practical aspects of generating and understanding Seismic Attribute responses and relating these from the mathematical geophysical generation to practical geological understanding and application.

COURSE CONTENT

- Theory of seismic attributes
- Seismic attributes in Petrel
- Colors and visualization of attributes
- Surface attributes in Petrel
- 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
- Salt
- Direct Hydrocarbon Indicators
- The creation of 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 training course is required. Petrel Geophysics course is recommended.

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

AUDIENCE

Development and exploration log analysts, Petrophysicists with limited or no experience using Techlog software.

PREREQUISITE

Techlog Fundamentals.

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

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

PREREQUISITE

Basic geology and reservoir modeling background.

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
- 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
- Thermal Maturation, TSR, Reactive Polar Precipitation
- Interpretive Pitfalls; Exercises
- Gas Chromatography, Stable Isotopes
- Oil Fingerprinting: Reservoir Compartments
- Leaky Casing, Production Allocation
- Interpretive Pitfalls; Exercises
- Hydrocrbon 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

Knowlege 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.

DOMAIN | SOFTWARE

COMPETENCY LEVEL	Geology and Geophysics	Petrophysics	Reservoir Engineering	Production Engineering	Management and Economics
ADVANCED		Advanced Reservoir Monitoring	Resources and Reserves Evaluation		Project Risk Analysis and Management
		Applied Production Logging and Reservoir Monitoring			
SKILL	Advanced Integrated Reservoir Analysis				Applied Project Management - Oil and Gas
	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	Basic Logging Methods and Formation Evaluation			
		Intermediate Production Logging and Reservoir Monitoring			
	Clastic Sedimentology for Exploration and Development				
FOUNDATION	Integrated Reservoir Analysis				Petroleum Economics
	Well Placement Fundamentals		Introduction to Reservoir Engineering		Project Management
	Development Geology	Basic Reservoir Monitoring			
		Basic Production Logging			
	Prospect Evaluation, Risks, and Volumes				
	Introduction to Field Development Planning				

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 | SOFTWARE

Petrel	ECLIPSE	MEPO	Merak	COMPETENCY LEVEL
				ADVANCED
Petrel Well Design				SKILL
Petrel Property Modeling				
Petrel Structural Modeling				
Petrel Velocity Modeling				
Petrel Geology	ECLIPSE Blackoil Reservoir Simulation	MEPO Uncertainty and Optimization Fundamental	Merak Peep Fundamentals and Merak Peep Decline Fundamentals Combined Course	FOUNDATION
Petrel Reservoir Engineering - 3 Day				
				AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 | SOFTWARE

COMPETENCY LEVEL	OFM	PIPESIM - INTERSECT	Techlog	Integrated Asset Modeler
ADVANCED			Techlog for Geologists	
SKILL		INTERSECT Reservoir Simulation	Techlog Wellbore Integrity VILT	Integrated Asset Modeler Fundamentals
		PIPESIM Gas Field Production Operation		
FOUNDATION	OFM Fundamentals Using Gas Operations Examples		Studio for Techlog Users	
	OFM Fundamentals			
	OFM Fundamentals Using Oil Production Examples			
AWARENESS	OFM Analysis Dashboard			

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.

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

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.

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.

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
- Justification for production logs
- Pulsed neutron capture cross-section mode and carbon/oxygen mode
- Acquisition of formation resistivity in cased hole
- Slimhole induction logging in plastic (nonconductive) casing
- Workshop: Using capture mode for evaluating water and gas saturation
- Workshop: Interpreting behind-casing resistivity logs

AUDIENCE

Geoscientists or engineers responsible for field-wide surveillance or reservoir monitoring programs.

PREREQUISITE

Engineering or geoscience degree.

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
- Identification of fluid contacts and pressure gradients
- 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 PMP® 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 "APM 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
- Project success and failure

AUDIENCE

Project engineers, supervisors, and project leaders seeking to increase their knowledge of project management.

PREREQUISITE

None.

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
- Performing incremental analysis
- Selecting projects

AUDIENCE

Anyone wanting a fundamental knowledge of petroleum economics.

PREREQUISITE

None.

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
- 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 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.

Basic Logging Methods and Formation Evaluation

Skill – 5 Days

This practical concept drive course will focus on openhole data acquisition and interpretation. The course will cover all the basics of log data acquisition and interpretation. New high technology tools and their application will also be reviewed. These technologies will include Nuclear Magnetic Resonance (NMR), Logging While Drilling (LWD), and optional topics, including wireline formation testing and borehole imaging. There will be daily workshops that cover the topics presented each day.

COURSE CONTENT

- Reservoir rock and basic logging
- Life of a well
- Spontaneous Potential (SP)
- Acoustic measurements
- Neutron porosity measurement
- Density measurements
- Deep reading resistivity (Rt)
- Shallow reading resistivity (Rxo)
- Archie's Equation and determining saturation
- Computing the value of Vsh
- Computing Sw in the presence of Shale
- Wireline Formation Testing (WFT)
- Magnetic Resonance Imaging (NMR)
- Borehole imaging

AUDIENCE

This course is intended for all engineers and technicians in the following fields, drilling, reservoir, geology, productions, petrophysics, and geophysics.

PREREQUISITE

None.

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

AUDIENCE

E&P professionals involved in data analysis and interpretation, including geologists, geophysicists, and reservoir engineers active in exploration, appraisal, field development, reserves estimation, or economics; decision makers interested in learning more about decision analysis.

PREREQUISITE

Exposure to basic statistics and a working knowledge of Microsoft Excel® worksheets.

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
- 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.

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
- Risk mitigation strategies, preliminary contingency levels, and critical variables
- Monte Carlo methods and expected monetary outcome
- Risk, earned value, and risk-based forecasts
- Stakeholder analysis and management skills
- Project and baseline reviews

AUDIENCE

Oil and gas industry project management professionals.

PREREQUISITE

Project Management course or PMI PMP Certificate or 7 years of experience in project management.

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 QC 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 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

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).

Advanced Reservoir Monitoring

Advanced – 5 Days

In this 5-Day immersive workshop, attendees will learn how to interpret the most difficult reservoir monitoring scenarios and diagnose unique reservoir behaviors. The course focuses on reservoir monitoring logging techniques, identifying specific strategies for the use and interpretation of pulsed neutron logging, formation resistivity measurements (Rt) behind steel and nonconductive casing, pressure measurements, and fluid sampling behind casing. At a hands-on interactive workshop, attendees will using learn how to adjust interpretation techniques for reservoir and field-wide phenomenon, especially in water flooding operations. Attendees are encouraged to bring difficult log examples for in-class discussion and interpretation.

COURSE CONTENT

- Reservoir fluids
- Reservoir drive mechanisms
- Inflow and outflow performance
- Justification for running reservoir monitoring logs
- Nuclear physics of reservoir monitoring and pulsed neutron logging (PNL)
- PNL tools: RST (SLB), RMT (HAL)
- PNL for capturing cross-section measurements
- PNL for carbon/oxygen (C/O) logging applications
- Log-Inject-Log to estimate residual oil saturation
- Cased hole formation resistivity behind steel casing
- Formation resistivity behind nonconductive casing
- Pressure measurements and sampling behind casing
- Field mapping of water flood to identify unswept zones.
- Using capture and C/O mode for evaluating water and gas saturation
- Interpreting resistivity logs behind the casing
- Reservoir monitoring log data

AUDIENCE

Petrophysicists and production engineers experienced with reservoir monitoring logging and log interpretation.

PREREQUISITE

Greater than 2 years of experience interpreting reservoir monitoring logs is recommended. You are encouraged to bring difficult log examples for in-class discussion and interpretation.

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
- 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.

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.

OFM Analysis Dashboard

Awareness – 4 Hours

This course introduces OFM Analysis dashboard as powerful data visualization tool helping you revel information to support better decision-making. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and shared results. You will learn to create highly efficient dashboards for production surveillance, project economics assessment, data mining, and data quality control.

Delivered in 4-hours-workshop style, the course offers a fast-track option to keep your skills updated with OFM new features. OFM analysis dashboard is also offered as part of the 2-day OFM Fundamentals class.

COURSE CONTENT

- Introduction to OFM analysis dashboard

AUDIENCE

Anyone interested in gaining a general understanding of OFM Analysis Dashboard.

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.

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.

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.

OFM Fundamentals

Foundation – 2 Days

The OilField Manager (OFM) Fundamentals course introduces new users to OFM functionality with emphasis on visualization, reporting, and data analysis. During this course, you will explore the intuitive software interface through a sequence of hands-on exercises designed to mimic practical oil-gas workflows to visualize, analyze, run calculations and share results. This course covers basic usage of the application, providing an understanding of how to configure and personalize an OFM workspace, to use and create project variables. You will learn about creating simple graph and reports, and performing basic data quality checks. You will also be introduced to the OFM Analysis Dashboard as a powerful data visualization tool helping you reveal information to support better decision-making. It also covers graphical display using GIS map-based representations.

COURSE CONTENT

- A brief walkthrough of a fully functioning project, providing 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
- Explore OFM analysis dashboard
- Create and format well and field summary reports
- Export reports and table data to other applications
- Use of GIS-map base

AUDIENCE

Anyone interested in gaining a general understanding of OilField Manager (OFM).

PREREQUISITE

An interest in using OFM software.

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 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 Uncertainty and Optimization Fundamental

Foundation – 3 Days

Sensitivity, subsurface uncertainty assessment, and history matching studies for calibrating reservoir simulation models are integral workflow tasks in many

reservoir simulation studies. The course is designed to provide the petroleum engineers with software skill and modeling techniques required to perform the tasks of managing reservoir uncertainties and optimization. It discusses how to use MEPO uncertainty and optimization tools to perform sensitivity analysis, uncertainty assessment, and optimization (history matching) and also covers the proxy modeling concepts, benefits, limitations and its applications using the avaliable workflow tools in MEPO.

COURSE CONTENT

- Introduction to Sub-surface Uncertainty Quantification
- Basic definitions for uncertainty and risk
- Discussion on sources of uncertainty and risk in the petroleum industry
- Explanation of dependencies and interactions between input parameters
- Discussion on MEPO processes which involves; Task management, Input parameter, Response parameters and Case management.
- Python and how to customize processing tasks using Python and also writing MEPO-specific Python scripts
- Pre-processing and post-processing loop in MEPO, including selected Python scripts
- Explanation of Proxy modeling concepts, application, benefits and limitation
- Discussion on how to identify application scenarios for proxy models
- How to define a training dataset for proxy model and creation of proxy model
- Validation of proxy model and how to create tests for evaluating proxy predictability

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

Ability to use ECLIPSE reservoir simulator.

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

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

Petroleum Economics Fundamentals or equivalent knowledge in addition to an understanding of basic decline analysis techniques and theory.

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.

Studio for Techlog Users

Foundation – 2 Days

The Studio for Techlog Users course is designed for users who are familiar with Techlog and who need to learn about Studio. Studio answers three major productivity challenges: data discovery, user collaboration and data management. The purpose of this course is to explain the fundamental concepts of Studio and describe the Studio environment and methodology. Aimed at users of Techlog, the course will cover how Techlog users can discover and retrieve data from Studio in the context of their project, share interpretation with their peers and collaborate together. The course covers topics such as connecting to Studio, sending and retrieving data, receiving automatic notifications of updates, locking and unlocking data as well as more advanced workflows such as resolving data matches or conflicts.

COURSE CONTENT

- Module 1: Overview and basic concepts
- Module 2: Techlog and the Studio environment
- Module 3: Data transfer
- Module 4: Team collaboration
- Module 5: Manage your data

AUDIENCE

- Information Management Professionals
- Petrophysicists

- Geologists
- Geomechanics Professionals
- Drilling Engineers
- Reservoir Engineers
- Geophysicists
- Any technical personnel familiar with Techlog but no experience in Studio.

PREREQUISITE

Techlog Fundamentals.

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.

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.

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
  - Structural gridding
- Corner Point Gridding
  - Data preparation
  - Modeling of main faults
  - Pillar gridding
  - Make horizons
  - Reverse faults
  - Modeling salt diapirs
- Tools for model optimization

AUDIENCE

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

PREREQUISITE

General knowledge of petroleum geology and geophysics. As well as Participation in the Petrel Fundamentals and Petrel Geology courses or equivalent Petrel experience is necessary.

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 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 algortihms.

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
  - 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.

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

AUDIENCE

Production engineers, facilities engineers, field production operations engineers.

PREREQUISITE

General knowledge of petroleum engineering and software skills.

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
- 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;
- Create well plan using Well plan designer;
- Modify well plan using Well plan designer, dragger, and Inspector;
- Convert proposed wells to advanced plans
- Create well plan using Well plan designer;
- Modify well plan using Well plan designer, dragger, and Inspector;
- Convert proposed wells to advanced plans
- Import offset well data using indexed EDM files;
- create drilling risk and manage risks;
- Introduce real-time data handling in Petrel
- Making scaled map view for well plan;
- Making scaled vertical view for well plan.

AUDIENCE

Drilling engineers, geologists, and petro-technical personnel with fundamental knowledge in Petrel and who needs to understand well path design and optimization within Petrel.

PREREQUISITE

Petrel Fundamentals course., In addition some basic knowledge of well design and drilling is recommended.

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

Reservoir engineering.

Techlog Wellbore Integrity VILT

Skill – 3 Days

This course is a VILT (virtual instructor led training) course delivered in real time. The course is designed for 2 days and delivered for a duration of 4 hours per day

and is delivered using the WebEx platform. The course content is structured to incorporate passive and active learning approaches. A programmed Wellbore integrity evaluation throughout the life of a well will lead to a timely well intervention which will prevent severe consequences such as production loss, downhole equipment damage and expensive remedial work that could result from loss of well integrity.

COURSE CONTENT

- Introduction to cement evaluation, tools principles and interpretation
- Casing collar locator
- Pipe evaluation
- Cement evaluation
- Pipe evaluation and Cement evaluation Report

AUDIENCE

Petrophysicists, Drilling Engineers, Borehole Production Engineers, Borehole Geologists.

PREREQUISITE

Techlog Fundamentals.

Integrated Asset Modeler Fundamentals

Skill – 5 Days

This course is based on Integrated Asset Modeler (IAM) 2013 release. it 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.

Techlog Production Logs Interpretations

Advanced – 3 Days

This course teaches participants the tools and workflows in Techlog for Production Logs interpretation. Techlog Production Logging workflows start from raw data preparation, visualization and QC, through processing to interpretation and end with the generation of a final customizeable report. The interpretation result is used to decide workover intervention and calibration of reservoir simulation model.

COURSE CONTENT

- Data import Preparation
- Production Logs visualization and QC
- Data processing
- Production Logging interpretation
- Multi-sensor data interpretation
- Reports

AUDIENCE

Production Logging Petrophysicist, Geologists, Log Interpreters, Reservoir Engineers.

PREREQUISITE

Techlog Fundamentals and Basic Production Logging domain.

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 .

DOMAIN | SOFTWARE

Coal Seam Gas	Tight Gas	Shale Gas - Shale Oil	Heavy Oil	COMPETENCY LEVEL
	Rock Physics - Integrating Petrophysical, Geomechanical, and Seismic Measurements			ADVANCED
		Production Data Analysis - Shale Gas, Tight Gas and Coal-Bed Methane		
		Shale Plays Production - Exploiting Production Sweet Spots		
		Shale Plays Evaluation - Finding Production Sweet Spots		
Unconventional Gas Reservoirs - Focus on Coalbed Methane and Introduction to Shale and Tight Sand Reservoirs				
Petroleum Systems and Exploration and Development Geochemistry				
Economics of Unconventional Resources			Geomechanics Applications in Heavy Oil	SKILL
Characterisation and Petrel* 3-D Modelling of Fluvio-Deltaic Sedimentary Architecture, Upper Carboniferous, East Kentucky	Microseismic Imaging and Hydraulic Fracturing			
Geomechanics Applications in Coal-Bed Methane		Completions and Stimulation Aspects of Shale Plays		
		Production Engineering Aspects of Shale Plays		
		Reservoir Engineering Aspects of Shale plays		
		Well Architecture and Drilling in Shale Plays		
		Water Management Aspects of Shale Plays		
		Petrophysics Aspects of Shale Gas		
		Geomechanics Applications in Shale Gas		
		Shale Oil Fundamentals		
Fundamentals of Coal Seam Gas (CSG) Development	Analysis and Development of Tight Gas Reservoirs	Rapid Field Development Planning of a Shale play	Heavy Oil Exploitation	FOUNDATION
Introduction to the Geology of Coalbed Methane		Introduction to Shale Reservoirs	Heavy Oil Reservoir Engineering	
		Shale Reservoirs - Applied Core Analysis		
		Geochemistry and Petroleum System Modeling of Conventional and Unconventional Resources		
		Basics of Shale Prospects		AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 .

DOMAIN | SOFTWARE

COMPETENCY LEVEL	Petrel	Mangrove	Techlog
ADVANCED		Mangrove Hydraulic Fracture Design Software	Techlog for Unconventional Shales Evaluation
SKILL	Petrel Reservoir Geomechanics		

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
- Completion
- Software
- Early Exploration
- Drilling Performance Improvement
- Well Performance Improvement
- Social & Environmental Sustainability

AUDIENCE

Technical & Non-Technical Managers & Staff, Functional and Support Managers & Staff, Contracts & Procurement Managers, Business Leaders & Managers, Financial Institutions, New Shale Entrants, University Graduates.

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
- Reservoir quality

- Overview of organic geochemistry laboratory measurements
- Overview of core acquisition, handling, and processing
- Tight rock analysis (TRA) method
- Completion quality
- Geomechanics laboratory techniques
- Geomechanical evaluation of unconventional reservoirs
- Hands-on tour of the geomechanics laboratory
- Integrating core measurements with log data
- Large-scale drilling and completion
- Shale core and data integration exercise

AUDIENCE

Engineers, geoscientists, financial decision makers, and managers concerned with the evaluation of gas shale resources.

PREREQUISITE

Engineering or geoscience background.

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
- Water disposal methods
- Coalbed gas exploration models

AUDIENCE

Reservoir and production engineers, geoscientists, and technical managers responsible for making exploration and development decisions and optimizing recovery from coalbed methane reservoirs.

PREREQUISITE

Basic knowledge of petroleum geology and engineering principles.

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 & 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 - Paleo Stress; 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.
- Production Philosophies – production and field redevelopment strategies to maintain production. Tools and workflows for production monitoring and control. Possible Flow Assurance Issues.

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?
- 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

Engineering or geoscience background.

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 over view 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, desorption 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.

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 welltests), 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?
- 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.

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.

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 modephase, 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
- 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.

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
- Mechanical earth models and tight rock analyses
- Key geomechanical elements affecting hydraulic fracture stimulation design

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 use 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 producibility
- 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 strategies, 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.

COURSE CONTENT

- Produced water's history and market overview
- Water cycle
- Water chemistry
- Lab work: water chemistry analyses and lab instrumentation
- Frac fluid compatibility
- 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
- Inorganics
- Organics
- Bacteria
- Laboratory techniques
- Quality assurance and control
- Data management
- Regulatory framework and air emissions
- 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 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
- 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.

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
- Fundaments 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
- 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.

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.

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
- 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.

PREREQUISITE

None.

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
- Classroom: modeling intro
- Overnight at Prestonsburg
- Stop 4: Ivel
- Stop 5: Raccoon Creek
- Classroom: modeling 1
- Overnight at Prestonsburg
- Stop 6: Sidney 1
- Stop 7: Sidney 2
- Stop 8: Zebulon 2
- Classroom: modeling 2
- Overnight at Prestonsburg
- Classroom: modeling wrap-up
- Stop 9: Burning Fork
- Stop 10: Zebulon 1
- Return travel to Lexington

AUDIENCE

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

PREREQUISITE

Working knowledge of Petrel.

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 Minifrac 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
- Fracture interpretation and pitfalls
- Fracture interpretation
- Interpretation pitfalls
- Advanced processing and interpretation

AUDIENCE

Geoscience 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.

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
- 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.

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
- 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
- Thermal Maturation, TSR, Reactive Polar Precipitation
- Interpretive Pitfalls; Exercises
- Gas Chromatography, Stable Isotopes
- Oil Fingerprinting: Reservoir Compartments
- Leaky Casing, Production Allocation
- Interpretive Pitfalls; Exercises
- Hydrocrbon 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

Knowlege 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

AUDIENCE

Multidisciplinary asset team members, geologists, geophysicists, reservoir drilling, production, completion, and facilities engineers, and managers.

PREREQUISITE

Bachelor's degree in engineering or geosciences, or experience in exploitation of unconventional gas reservoirs.

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.

Shale Plays Production - Finding Production Sweet Spots

Advanced – 4 Days

According to some industry forecasters, the E&P gas boom is just beginning. In this course, the focus is on the engineering aspects of exploiting shale gas reservoirs. Attendees will gain an understanding of the methods and workflows for characterizing and developing these unconventional resources, including reservoir evaluation, well architecture and placement, completions, hydraulic fracture treatments, and production. The course also includes the fundamentals of the asset exploitation life cycle. Instruction includes field examples and in-class exercises on the economic viability of these assets.

COURSE CONTENT

- Unconventional versus conventional reservoirs
- In-depth discussion of shale gas and shale oil reservoirs: Evaluation methodologies and workflows; basic geologic, geophysical, petrophysical, and geomechanical considerations
- Introduction to drilling operations and to methodologies and workflows for well architecture, construction, and placement
- Best practices: Well completions, stimulation strategies, operations, and evaluations
- Production and field redevelopment strategies to maintain economic production

AUDIENCE

Operating company multidisciplinary personnel, including asset team members, engineers, geoscientists, financial decision-makers, and resource managers.

PREREQUISITE

Bachelor's degree in engineering or geosciences.

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.

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
- 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 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.

Petrel Reservoir Geomechanics

Skill – 3 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
- Geomechanical Property Modeling

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, Petrophysicists.

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.

DOMAIN

Geoscience	Reservoir Characterization	Reservoir Management	COMPETENCY LEVEL
	Characterization, Evaluation and Enhanced Oil Recovery in Naturally Fractured Reservoirs		ADVANCED
	Evaluation and Management of Fractured Reservoirs		
	Advanced Formation Evaluation in Carbonates		
Syn-Rift Carbonate Platforms; Miocene-Recent Gulf of Suez	Advanced Carbonate Petrophysics From Pores to Logs		SKILL
Oligo-Miocene carbonate sedimentary models of Malta: analogues for Cenozoic reservoirs worldwide			
Arid Coastline Carbonates and Evaporites of Abu Dhabi, UAE			
Carbonate Sequence Stratigraphy and Application to Petroleum Reservoirs			
Applied Carbonate Sequence Stratigraphy			FOUNDATION
Fractured Reservoir Characterisation with Emphasis on Carbonates			

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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
- Conceptual geological models
- Heterogeneities of carbonate systems
- Role of outcrop studies in reservoir geomodeling
- Petrophysical modeling of carbonates

AUDIENCE

Oil and gas geoscientists who wish to learn more about interpretation of carbonate reservoirs.

PREREQUISITE

Basic understanding 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 involved in exploration and development for carbonate reservoirs.

PREREQUISITE

Basic knowledge 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
- Oolith deltas, interdelta coral patch reefs, coral thickets, red algae, sea grass
- Ras Gharab and Futaisi 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
- Rufaiq approach road: lateral zonation within microbial mats, hardgrounds, and tepee structures
- Bu Labyad area: Miocene and Pleistocene zeugen and Miocene salina
- Thumayriyah: microbial mats and evaporites
- Jebel Dhanna: spit-lagoon complexes
- Beach rocks and coniatolites
- Sabkha Matti: a continental sabkha
- Sila: 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 CONTENT

- Lectures and exercises: carbonate grains, carbonate accumulation processes and carbonate factories, depositional environments, facies and facies models
- Rimmed carbonate platforms (Florida and Bahamas) and carbonate ramps
- Field study: ramp carbonate facies and facies models; Lower Coralline Limestone, southwest Malta
- Transect from inner, to mid, to outer ramp facies belts
- Evening classroom: correlation of field sketch logs from inner to outer ramp and construction of facies model
- Lectures and exercises: principles of carbonate sequence stratigraphy
- Field study: shelf and pelagic limestones, synsedimentary tectonics, karstic dissolution features, and calcretes
- Globigerina Limestone Formation, Gozo Island
- Study of spectacular karst dissolution structures (Miocene blue holes)
- Pleistocene subaerial exposure surface calcretes
- Field study: contrasting carbonate factories and porosity evolution
- Upper Coralline Limestone
- Evening petrographic exercises
- Field study: carbonate depositional sequences, sequence boundaries, and slope deposits on a rifted platform margin
- Shelf carbonate facies in two depositional sequences

AUDIENCE

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

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 uncertainity 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.

DOMAIN | SOFTWARE

COMPETENCY LEVEL	Reservoir Characterization - Field Trip	Reservoir Characterization - Classroom	Drilling	Production
ADVANCED		Deepwater Seismic Interpretation	HPHT Drilling Design and Operations	
			Deepwater Well Project and Risk Management	
SKILL	Delta-slope-turbidite deposition and synsedimentary deformation - County Clare, Ireland	Deepwater Geohazards		
	Depositional Environments from Slope Aprons to Tropical Reefs - Tabernas & Sorbas Basins, Spain		Deepwater Drilling Design and Operations	Economics of Deepwater Projects
	Permian basin floor fan systems of Karoo, South Africa	Deepwater Sedimentary Systems: Exploration and Production		
		Sedimentology and Depositional Environments of Deepwater Deposits		
		Deepwater Petroleum Systems - Fundamentals and Applications		Subsea Production Systems (SPS) and Technologies
FOUNDATION		Deepwater Reservoirs	Introduction to Deepwater Rig Operations	

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 .

DOMAIN | SOFTWARE

ECLIPSE	Petrel	OLGA	Drillbench	PIPESIM	COMPETENCY LEVEL
INTERSECT Reservoir Simulation	Petrel Exploration Geology: Integrated Evaluation of Petroleum Systems, Plays and Prospects	OLGA Well Dynamics		PIPESIM Gas Field Production Operation	SKILL
		Drillbench Blowout Control		PIPESIM Advanced Well Modeling	
		PVT For Flow Assurance and Production Engineering Applications			
		OLGA Flow Assurance (3 days)	Drillbench Dynamic Well Control Modeling		FOUNDATION
		OLGA Flow Assurance (5 days)	Drillbench Dynamic Hydraulics and Temperature Modeling		
			Wellflo Underbalanced Hydraulics Modeling		

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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, contourites (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 functioning 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 andreconstructing 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 fan 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.

PREREQUISITE

Basic petroleum geology, basic stratigraphy, and basic sedimentology.

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.

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.

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.

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

Skill – 6 Days

Using seismic scale cliff exposures of Namurian strata, this course will focus on depositional complexities and syndepositional deformation structures that characterize delta-slope-turbidite successions Structures include 200-m high cliffs of the carboniferous strata of County Clare currently undergoing intensive research and recently highlighted in a journal article. The strata comprise some of the most spectacular sedimentary geology in western Europe, displaying a wide range of delta, slope, and turbidite facies and sequences, enabling reconstruction of the infilling a major northern Europe basin. Cyclicity of the deltaic succession is thought to have driven eustatic sea-level changes, resulting in extensive flooding surfaces overlain by fossiliferous marine bands and in major palaeovalley fill sandbodies. The deltaic intervals show abundant soft-sediment deformation, e.g. growth faults, mud diapirs, and sand volcanoes. The course will include at least one boat trip to view key cliff exposures. The course base is Kilkee, County Clare.

COURSE CONTENT

- Introduce the local stratigraphy and setting
- Mouth bar sands
- Penetrative mud diapir, flooding surfaces, and marine bands
- General basinal content, and Ross formation turbidites
- Turbidite facies, including channels and megaflutes.
- Bridges, major slump sheets, turbidite channels, and sand volcanoes
- Boat trip to view Ross formation in sea cliffs between Carrigaholt and Loop Head and possible boat trip to view basinal Clare shales and Ross formation base
- 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.
- Truklieve: Tullig progradation, flooding surfaces, minor parasequences, palaeovalley erosion and stacking; wave-influenced mouth-bars; marine bands.
- Foohagh Point: Growth faulting in Doonlickey cyclothem.
- 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.
- Spanish Point: Extensional faulting of mouth bar sands over diaper; Doonlickey cyclothem.
- Doolin; basinal mudstone facies at northern margin of basin.
- Fisherstreet: Basal turbidites 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, and reservoir engineers.

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 geomechnic and pore pressure modeling.

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

Basic understanding of geology and geophysics.

Deepwater Well Project and Risk Management

Advanced – 5 Days

The key objectives for this course are to highlight the critical project and risk management issues involved in a deepwater well project to achieve the project mission: delivering value safely, responsibly and efficiently.

At the end of the course, participants will understand the key issues and principles in deepwater project management, they will develop an understanding of the challenges, choices, and compromises necessary to drill deepwater wells.

They will be able to apply these principles in practice as members of a project team to optimize the management of the well project, and to identify and manage risks to maximize value. Following the deepwater well project management process from prospect evaluation through operations and close out, participants will develop key skills needed to drill wells in a deepwater environment.

COURSE CONTENT

- Deepwater Well Project and Risk Management Principles
- Deepwater challenges: how the deepwater setting offers challenges different from wells onshore or in shallow water.
- Risk management principles; hazards, risk, risk management
- The project plan: clarity on mission, objectives, and value
- Time and cost estimation: understanding and reflecting uncertainty in realistic estimates
- Management of Change: the challenge of ensuring value – decisions not decision trees
- Contracting: selecting the right contracting approach for different services and materials
- Supply chain, logistics, and operations base: getting materials and services to the well at the right time cost-effectively
- Financial management: funding and accounting
- Management review: how to ensure that audits and management interface assures safe and responsible delivery of the project mission
- Tracking Progress, Well Planning, and Operations
- Well PM software and Key Performance Indicators (KPIs): monitoring the project using value-focussed KPIs; discussion of PM software, management reports, continuous improvement, benchmarking, technical limit, and KPIs
- Task progress and phase close out: ensuring early identification of potential differences in outturn time or cost to permit value-based decisions
- Well planning - Pre-drill data requirements: the site survey and shallow hazard analysis, and how this sets the stage for success
- Rig selection: on the basis of hull type, station-keeping, generation, market, crew competence, and management system
- Riser and conductor design, shallow hazards: well construction in the top hole sections
- Casing programme and the mud density window: how the deepwater setting affects well design and how this is managed

- Operations Management and Risk Management in Action
- Contingency plans: ensuring that these are complete and meaningful
- Emergency response: how this fourth element of process safety is assured.
- Operations management: applying decision-making, technical limit, communications, in the Execute Stage of the project.
- Applying risk management tools: how a variety of tools are used to manage risk throughout the project
- Macondo review: what should we be learning from Macondo? Analysis and key factors for focus
- Project Success Factors in Deepwater Wells
- Project success factors: sources of value, development skills, key factors in successful projects
- Human factors in well projects: understanding how human factors are key in both driving success in the project, and in managing risk, in planning, execution, and learning
- inal exercise: creating a springboard for continued application of project & risk management principles in future projects.

AUDIENCE

Geophysicists, geologists and drilling engineers.

PREREQUISITE

Basic understanding of geology and geophysics .

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. Wavelets, 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 Reservoirs 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.
- 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.
- Deepwater Petroleum Systems: Source Rock Burial, Migration Paths, Trap Formation, Hydrocarbon Emplacement.
- Prospect Generation ; Risking of Deep-Water Prospects ; Project Economics.
- Southeast Asia: Makassar Strait, South Irian Jaya, South China Sea, Palawan Basin, West Natuna Sea.
- Mapping Exercise #4: Southeast Asia Deep-Water Reservoirs.
- Fault Contouring. Discussion of Mapping Techniques.
- Velocities and Depth Conversion in deep-water.
- Wells Location and Depth Map Construction.
- Case Histories – GoM, West Africa, East Brazil, North Sea, Asia .
- Course Review – Thematic discussion, topics, questions, answers.

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
- Well Control Emergencies
- HPHT Completions
- Design Considerations
- Component Selection and Specifications
- Tubing Leak Contingencies
- HPHT Well testing
- Operational Testing Considerations
- Well testing Safety

AUDIENCE

DDrilling professionals with well design and operations experience desiring an understanding of the challenges faced in the HPHT drilling environment. This class can serve as an introduction to both early career and experienced drilling professionals for HPHT drilling technology.

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. Participants need to be familiar with and understand basic geomechanics, drilling operations, well placement, well planning, and drilling fluids basics. An understanding of well control concepts and procedures is a plus.

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 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.

Drillbench Dynamic Hydraulics and Temperature Modeling

Foundation – 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 Microsoft 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.

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.

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
- Advanced software options
- Advanced software features: Managed pressure drilling and well control simulations

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.

PVT For Flow Assurance And Production Engineering Applications

Skill – 5 Days

The key for flow assurance modeling in PIPESIM and OLGA is through proper fluid modeling. This course gives a comprehensive overview of EOS fluid modeling for systems where solids may form. Procedures for matching EOS model to lab experiments are covered as well as the procedure to export black oil or compositional files for production simulators like PIPESIM and OLGA.

COURSE CONTENT

- PVT sampling techniques
- Compositional analysis
- PVT experiments and PVT reports
- Quality control of fluid compositions
- EOS modeling of petroleum fluids
- C7+ characterization and lumping
- Viscosity tuning
- Multiple fluid EOS modeling
- Modeling of Polar components: water and salts
- Hydrates
- Hydrate inhibitors
- Asphaltenes

AUDIENCE

Who wants to expand their knowledge in PVT fluid modeling for OLGA or PIPESIM applications.

PREREQUISITE

Attendees need a working knowledge of the basic OLGA or PIPESIM. Previews experience in simulations on petroleum fluids with an emphasis on flow assurance is an advantage.

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.

PIPESIM Advanced Well Modeling

Skill – 2 Days

In this course, you will learn how to use PIPESIM to simulate wells for designing completions and artificial lift systems. The designs are then evaluated for future conditions based on changing reservoir characteristics.

COURSE CONTENT

- Conceptual well design for deepwater developments
- Subsea tieback design to account for backpressure effects
- Evaluate inflow performance
- Design optimal perforations
- Perform gas lift design
- Perform ESP design
- Evaluate the effectiveness of multiphase boosting
- Review alternatives based on forecasting

AUDIENCE

Anyone who needs to learn how to evaluate various artificial lift options, optimize gas lift allocation, and perform ESP design using PIPESIM software.

PREREQUISITE

PIPESIM Fundamentals or a working knowledge of PIPESIM 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

Reservoir engineering.

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

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
- 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

Health and Safety	Environment	Security	COMPETENCY LEVEL
Emergency and Crisis Management in the Offshore Oil & Gas Environment			ADVANCED
Stepping, Handling, & Lifting Techniques for Oil & Gas Operations (INSTRUCTOR TRAINING)			
Advanced Driving Skills Course			SKILL
Stepping, Handling, & Lifting Techniques for Oil and Gas Operations Employees			
Stepping, Handling, & Lifting Techniques and Desk Ergonomics for Office Employees			
Marine Seismic HSE Fundamentals			
Drilling Project and Risk Management			
Risk Management for Projects			
QHSE for Line Managers			
Root Cause Analysis (RCA)			
Human Error Management			
HSE in Oil & Gas Exploration & Production			FOUNDATION
HSE for Front-Line Supervisors in Oil & Gas Exploration & Production			
Oil Spill Response & Control			
Newcomer Employee Workplace HSE			AWARENESS

Software | Technical courses that use software | Includes practical sessions | Field trips | Uses simulation

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 (LO/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.

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 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
- 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.

Human Error Management

Skill – 3 Days

COURSE CONTENT

- The Organizational Infrastructure
- The 6 Basic Questions for Change
- WHY – Forces of Change
- WHEN – 5 Stars, 6 Boxes, 7 "S"
- WHERE – The Individual, The Organization, The Environment
- ADKAR
- Paradigms
- The Beckhard-Harris Formula for Change
- The 3 Phases of Change (Current, Transition, Future)
- Kotter 8 Steps to Change
- Lewing Change Model
- Boss vs. Leader
- DiSC Personality Profiles
- Effective Change Components
- Humans & Change
- Challenges of Change Management
- Resistance to Change
- Communications
- The Culture Iceberg
- John Fisher's Transition Process
- Basic Emotions
- Managing Motivations
- Change Agents
- Change Style Indicators
- CSI and DiSC
- CSI and the Transition Process
- Classical Conditioning. Ivan Pavlov
- Intrinsic vs. Extrinsic Motivation
- Ryan & Deci Self Determination Theory
- The Forces of Change. Kurt Lewis

- Force Field Analysis –What, Why, Where, When, Who, How –Models and Templates
- Lewin and Kotter
- Tools for FFA –Brainstorming, Pareto, Prioritization Matrix
- Framework for Organizational Change –Roles, Rules, Tools, Action Plan
- Change Management Best Practices

AUDIENCE

Managers and especially those who must lead a transition in a changing business environment.

PREREQUISITE

Some Management Experience.

Root Cause Analysis (RCA)

Foundation – 3 Days

COURSE CONTENT

- Safety Business & QHSE Objective
- Safety, Hazards, Risks. Hazards Identification Tools
- Risk Assessment & Risk Management [Intro]
- Events, Incidents, Accidents. Statistics
- Accidents Causation Theory
- Contributors to Accidents
- Heinrich's Domino Theory
- Loss Causation Model
- Bird's Accident Triangle
- The Hidden Costs of Accidents
- Introduction to Investigation
- Investigation Process Detail
- The Incident
- Severity & Responsibility Matrices
- Information Gathering
- Investigation Team
- People – Parts – Paper – Position
- Interviewing Technique
- Action Items
- Containment versus Corrective Actions
- Investigation Closure
- Documentation
- Substandard Investigation
- Root Cause Analysis Introduction
- What is RCA?. Why use it?
- Levels of Causes of Accidents
- RCA Methodology (Define – Analyze – Solve)
- RCA Tools (Brainstorming – Pareto – 5-WHY – Fishbone)
- RCA Follow up
- High Potential Incidents
- Mine the Diamond
- Behavior and Culture
- The HSE Culture Ladder

AUDIENCE

Managers and Investigation Team Members and Leaders.

PREREQUISITE

Management Experience or Assignment as investigation team member.

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
- Personal security risk management
- Health risk management
- Team peer evaluations and individual action plan discussion
- 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.

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.

Marine Seismic HSE Fundamentals

Skill – 5 Days

This 5-days course covers a full range of topics of safety, health and environment in marine seismic industry. It describes and presents HSE methodologies, processes, procedures and tools necessary to ensure and manage a safe working environment on-board a seismic research vessel. Participants will review the terminology used and reinforce the importance and relevance of most vital aspects of marine seismic HSE, which would continue to support them in their roles within the seismic industry.

Marine Seismic HSE Fundamentals course follows the IOGP 292 Competency Management Guidelines for the Geophysical Industry, which can be tailored to the specific requirements of individual clients in respect of the content.

COURSE CONTENT

- Introduction to Marine Seismic Industry
- Introduction and development of the HSE
- HSE Management Systems
- Local Legislation
- Exercise 1:Piper Alpha short case study of main failings
- Manual Handling & Ergonomics
- Hazard Identification & Risk Analysis
- Risk Management and Job Safety Analysis (JSA)
- Exercise 2: Hazard hunt and risk controlThe exercise requires the participants to identify a range of hazards and define associated risks and potentials. And possible controls and mitigations.
- Equipment Safety
- Operational Systems on board
- Safe Working Procedures & Permit to Work and Lock out Tag out (PTW & LOTO)
- Personal Protective Equipment
- Exercise 3: PPE selectionThe exercise will study several different scenarios and require the course delegates to select appropriate PPE for the tasks within the scenarios.
- Social Media & Community Relations
- Personal Security

- Safety Leadership
- Auditing techniques
- Exercise 4: Develop a set of auditing questions for small boats and Gun Deployment scenarios
- Behavioural Based Safety
- Incident investigation & Root Cause Analysis
- Marine Life Protection
- Waste Management
- Exercise 5: Behaviour based safety exercise positive behaviour re enforcement and intervention in unsafe behaviour (role play incorporated)

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
- Prework warm-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
- 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 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

COMPETENCY LEVEL	DrillSim	Drilling Management Trainer (DMT)
ADVANCED	IWCF Well Intervention Pressure Control Certification - Level 4, Well Site Supervisor Training	
	IWCF Surface Well Control Certification (Supervisors) Level 3&4	
SKILL		Managing Drilling Operations (with Drilling Simulator)

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-3&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"
- WFC Practical Assessment
- WCF practical assessment with simulator
- Self-study to prepare for written examinations
- Group study
- WCF Written Examinations
- Principles and procedures
- Surface well equipment
- Re-sit (as required)

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)
- Equipment1 – Completion Equipment
- Class Exercise1 – Completion Equipment
- P&P1 – Pressure Control Management
- Class Exercise2 – Pressure Control Management
- P&P2 – Barrier Principles
- P&P3 – Well Information

- P&P4 – Shut-in Procedures
- P&P5 – Pressure Control Methods
- P&P6 – Problems
- Class Exercise3 – Barrier Principles, Well Information, Shut-in Procedures, Pressure Control Methods and Problems
- Equipment2 – Wireline Equipment
- Class Exercise4 – Wireline Equipment
- Equipment3 – Coiled Tubing Equipment
- Class Exercise5 – Coiled Tubing Equipment
- Equipment4 – Hydraulic Workover (Snubbing) Equipment
- Class Exercise6 – 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 ORValid 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 accreditted center prior to enrollment on this Level-4 course.

Simulator Based Training - 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.

DOMAIN

Artificial Lift Simulator	COMPETENCY LEVEL
Integrated Production and Well Operations Modeling	FOUNDATION

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.

Simulator Based Training - Surface Facilities

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

COMPETENCY LEVEL	DSS-100 Dynamic Simulator System
FOUNDATION	Introduction to Oil Field Surface Facilities Operations with Simulator

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 .

DOMAIN

OilSim	COMPETENCY LEVEL
Petroleum Geopolitics with OilSim	SKILL
Introduction to Geology with OilSim	FOUNDATION
Introduction to Management of E&P Business with OilSim	
Introduction to Geophysics; Acquisition, Processing and Interpretation with OilSim	
Project Management Fundamentals	
Introduction to Shale Reservoirs	
Oil and Gas Business Simulation with OilSim	AWARENESS
Introduction to Petroleum Exploration and Production with OilSim	

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 and 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 interpret geophysical, geological, and engineering data used in exploration, development and production assess the economic viability of reservoirs understand elements reservoir depletion, including secondary recovery issues compare and evaluate different field development designs create field development project plans and understand the practical implications when implementing the plans understand the implications of different decisions in the operations phase.

Attendees will be grouped in teams and challenged to explore and discover oil and gas, create and implement a field development plan, and operate the well until abandonment. An experienced OilSim 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.

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
- Production philosophies
- OilSim challenge 5

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.

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.

Introduction to Geophysics; Acquisition, Processing and Interpretation 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 vibroseis

- 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
- Imaging
- 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 dngineers, 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
- 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:

- Petrotechnical
- Operations and Maintenance
- Management, Economics and Finance
- Health, Safety and Environment (HSE)
- Schlumberger Software
- Technical Challenges
- Simulator Based Training

NExT has more than 600 course offerings that include technical and software courses, integrated training programs 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).

TRAINING PROGRAMS

With more than 16 years of experience helping clients develop their oil & gas asset teams' skills, NExT understands the unique challenge in aligning an asset team's abilities with strategic objectives. NExT training programs are designed to align and accelerate the skills development of your engineering and geoscience teams. Tailored to your specific business objectives, NExT combines an essential mix of learning experiences to maximize the return on your training investment.

Through the combination of expert-led courses, in-class projects customized for your asset challenges, field and lab courses that provide hands-on learning experiences, industry-leading software tools, and one on one mentoring, NExT blends a targeted, skills development program that accelerates your team's core competencies.

NExT has designed and delivered over 600 training programs worldwide, customized for each unique business challenge, including advanced asset teams focused on unconventional gas resources and multi-discipline organizations seeking to accelerate the skills development of hundreds of engineers and geoscientists.

Examples of NExT's training program experience include:

Geology Training Programs	Fresh-out/Student Intern Integrated Training Program
Geophysics Training Programs	Multidomain Shale Training Program
Petrophysics Training Programs	Integrated Field Development Program
Geomechanics Training Programs	Flow Assurance Training Program
Drilling Engineering Training Programs	Subsurface Integration Program
Production Optimization	International Oil & Gas Management Program
Health, Safety and Environment Training Programs	Subsurface Engineering for New Hires
Unconventional Resources Programs	

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.

Geology Training Programs

Geology is the cornerstone of Hydrocarbon exploration and development; and oil and gas are found in a variety or depositional and structural settings. The programs listed here are general training programs and can easily be customized for specific environments and challenges.

EXPLORATION GEOLOGY

This program is designed to develop the knowledge and skills necessary for a geologist working in an exploration/new ventures role to do their day–to–day work. The program progresses from foundational to advanced topics and is a compilation of theory, software and blended courses.

DESCRIPTION OF COURSE PROGRESSION

- At Foundation level, Petroleum Geology and Subsurface mapping cover the fundamentals of geology and the variety of data that are integrated to achieve a 3-dimensional understanding of the subsurface. These concepts are then applied to the construction of maps and sections necessary for identifying potential traps and reservoirs. In addition, the basics of Petrel software operation and Geology workflows are explained.
- At Skill level, key geologic concepts related to structure, stratigraphy and sedimentology are taught to gain knowledge of key elements in prospect development. Software courses focus on Prospect development and Structural Modeling. A blended course (mix of software and domain in the same course) is included here that defines the complete play-to-prospect workflow.
- At Advanced level, Petroleum Systems and fault analysis courses provide understanding and analysis in 1D, 2D , and 3D modeling for in depth knowledge of basin development. Play chance maps rank potential plays and prospects, quantifying the geologic and economic risk associated with each potential reservoir.

DEVELOPMENT GEOLOGY

This program is designed to provide a geologist working in a development role with the domain and technical skills necessary for their day-to-day work. The program progresses from foundational learning to more advanced topics and is a combination of theory, software and blended courses.

DESCRIPTION OF COURSE PROGRESSION

- At Foundation level, Petroleum Geology and Subsurface mapping cover the fundamentals of geology and the variety of data that are integrated to achieve a 3-dimensional understanding of the subsurface. This is supported by training in the basics of Petrel operation and key geologic workflows.
- At Skill level, a mix of domain, software, and practical application enable the geologist to understand key aspects of development geology ; from operations and wellsite geology and sequence stratigraphy, to practical modeling and well design. Two blended courses (domain and software within the same course) teach the skills necessary to build and populate a 3D static model of the reservoir.
- At Advanced level, more specialized topics are addressed, such as fault seal and understanding the impact of fractures and faults on production to planning additional wells.

Geophysics Training Programs

EXPLORATION GEOPHYSICS

The overall objective of this program is to deliver geophysics professionals the key concepts, principles and technologies essential to exploration. Practical issues, and pitfalls which affect the application of geophysical data and information in E&P workflows are discussed. Learning objectives progress from basic awareness to advanced knowledge levels The program is a combination of domain, software and blended courses.

DESCRIPTION OF COURSE PROGRESSION

- At Foundation level, Introduction to Geophysics focuses on a practical understanding of seismic acquisition, processing, imaging, interpretation and prediction of geological and petrophysical properties from seismic. Practical aspects of seismic interpretation are covered with examples that involve seismic structural mapping, stratigraphic analysis, and amplitude/attribute methods. These learnings are reinforced with Petrel software training that focuses on Geophysical workflows.
- At Skill level, topics central to geophysical exploration workflows are addressed; this is a very practical stage, with much of the training (Interpretation, AVO and Inversion, Depth Conversion and well tie) being addressed in blended courses which are mix of theory and practical. Theory on structure and stratigraphy is also provided. This knowledge allows for accurate interpretation of the subsurface and estimation of potential reservoirs based on typical seismic response.
- At Advanced level, The relationship between rock physics, geomechanics and acoustic response delivers the integrated understanding for a geophysicist to perform the necessary tasks related to exploration. Complex software tasks such as Quantitative Interpretation (advanced inversion and modeling) and ray tracing are addressed.

Petrophysics Training Programs

APPLIED OPEN HOLE PETROPHYSICS

This program will take the participants through a series of domain, blended and/or software classes that cover Physics for wireline and MWD/LWD logs, log and core analysis, interpretation and Integration to obtain a comprehensive petrophysical characterization at well, reservoir and field scales.

DESCRIPTION OF COURSE PROGRESSION

- Tool Physics-Standard Logging tools provides a solid foundation and knowledge of the various logging tools.
- Techlog Fundamentals will give the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images.
- Basic Logging Methods and Formation Evaluation and Techlog Formation Evaluation (Quanti) are combined to give a very practical course focus on openhole data acquisition and interpretation and how to use implement the single/multi well, single/multi zone in Techlog
- Applied Core Analysis - How to Interpret Core Data. Is an applied course that will provide participants an improved understanding of the basics of rock based petrophysics, including routine core analysis methods and special core analysis techniques.
- MWD and LWD Tool Physics and Applications. This course covers all the various new technologies of MWD and LWD
- Advanced Formation Evaluation in Sandstones and Techlog Formation Evaluation with Quanti.Elan are combined to give a very comprehensive approach to solve the problems in shaly (laminated/dispersed) sands reservoirs.
- Applied Capillary Pressure and Saturation Height Modeling and Techlog Saturation Height Modelling (SHM) are combined to on how to use capillary pressure data to help the user understand what is controlling the fluid distribution in the reservoir, the importance of pore geometry and why water saturation is not an accident.
- Tool Physics - High Technology Imaging and Logging Tools provides a solid foundation and knowledge of the various more advanced logging tools.
- Advanced Formation Evaluation in Carbonates is focus on solve the major carbonates interpretation challanges. A strong emphasis will be placed on pore geometry and evaluating the parameters that effect carbonates such as “m”, “n”, and microporosity.
- Petrophysics Aspects of Shale Gas and Techlog for Unconventional Shales Evaluation are combined to provide knowledge on how to use 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.

TECHLOG PETROPHYSICS

This program will take the participants through a series of domain, blended and/or software classes that cover Physics for wireline and MWD/LWD logs, log and core analysis, interpretation and Integration to obtain a comprehensive petrophysical characterization at well, reservoir and field scales.

DESCRIPTION OF COURSE PROGRESSION

- Techlog Fundamentals will give the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images.
- Techlog Formation Evaluation develops the skills to perform a log interpretation and how to use implement the single/multi well, single/multi zone in Techlog.
- Techlog Python introduces to basic python syntax and programming, some Python and Techlog modules (libraries) will be introduced.
- Techlog Formation Evaluation with Quanti.Elan will give the tools to build multimineral/multifluids log interpretation models and generating solutions with the Quanti.Elan solver of Techlog.
- Techlog Cased Hole Formation Evaluation is focused on the Pulse Neutron interpretation of Sigma and Carbon Oxygen Ratio measurements.
- Techlog Reservoir Petrophysics will provide the skills to handle, prepare, interpret and integrate core, pressure and petrophysical data to define fluids distribution.
- Techlog for Unconventional Shales Evaluation will provide you a Techlog workflow to complete a Petrophysical evaluation of a shale oil and a shale gas reservoir.
- Techlog Thin Bed Analysis using the LowReP method will give you the tools to interpret thin bed reservoir.
- 3D Petrophysics for High Angle Well Evaluation will introduce the log interpreters to the high angle and horizontal well formation evaluation methodology and workflows deployed in 3D Petrophysics module of Techlog.
- Techlog Pore Pressure Prediction and Wellbore Stability covers the fundamental theory of geomechanics for pore pressure and wellbore stability applications using Techlog* wellbore software platform.
- OJTs 1 to 6
  - Participants will receive datasets to practice the acquired knowledge and achieve the proficiency in the use of Techlog.
  - The participants will receive a very detailed document with specifications on the tasks and deliverables.
  - The results will be reviewed even in the next week of courses or in a virtual section.

RESERVOIR MONITORING AND CASED HOLE

This program will take the participants through a series of domain, blended and/or software classes that cover physics and interpretation of Reservoir Monitoring and Cased Hole logs.

DESCRIPTION OF COURSE PROGRESSION

- Techlog Fundamentals will give the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images.
- Basic Production Logging his course teaches you the use and limitations of a variety of production logging tools including spinner, temperature, noise, fluid injections and others tools.
- Cased Hole Logging and Formation Evaluation covers all the aspects of the fundamentals of cased hole formation and production evaluation.
- Introduction to Cased-Hole Data Acquisition and Interpretation (VIRTUAL TECHLOG SOFTWARE COURSE) covers three main cased hole topics in Techlog: Well Integrity, Production Logging and Reservoir Monitoring.
- Applied Cased Hole Log Evaluation and Data Quality Assurance.
- Well Integrity - Cased Hole Logging and Monitoring teaches advanced techniques on how to monitor and diagnosis wellbore integrity with the aid of cased hole logging tools.

UNCONVENTIONAL PETROPHYSICS OF SHALES

This program will take the participants through a series of domain, and software classes that cover.

DESCRIPTION OF COURSE PROGRESSION

- Techlog Fundamentals will give the foundation utilities for loading, unloading, manipulating, and displaying data in the system, including core and images.
- Applied Reservoir Property and Core Analysis for both Conventional and Unconventional Reservoirs introduces to applied core analysis for both conventional and unconventional reservoirs.
- Petrophysics Aspects of Shales goes 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.
- Formation Evaluation with Quanti.Elan and Techlog for Unconventional Shales Evaluation will give the tools to build multimineral/multifluids log interpretation models and generating solutions with the Quanti.Elan solver of Techlog, focus on shales.
- Unconventional Gas Exploitation provides attendees with focused instruction on the geological and petro physical attributes of unconventional reservoirs, including the origin and accumulation of natural gas.
- Geomechanics of Shale Gas helps understand the essential aspects of Geomechanics in shale gas enabling an engineer or geoscientist to make better field development decisions.

Geomechanics Training Programs

GEOMECHANICS FOR SUBSURFACE

A geomechanics training program designed to take a team of subsurface specialists through a series of geomechanics domain, blended and/or software classes that ultimately enables an asset team to integrate geomechanics workflows into their day-to-day reservoir management activities.

DESCRIPTION OF COURSE PROGRESSION

- Fundamentals of geomechanics introduces the subject and its various applications in the petroleum cycle from exploration, appraisal through to development and production.
- The Pore pressure and/or Geohazards courses focus on pore pressure and drilling hazard studies necessary for efficient planning and safe drilling of exploration wells.
- Techlog software and blended classes on Acoustic processing, Practical applications of acoustic logs and Pore pressure / Wellbore stability modelling provide hands-on technology training on Schlumberger geomechanics software technology that can direcTechlogy be taken into well data analysis and well planning workflows.
- The Rock physics and Advanced Geomechanics classes take the well-centric workflows from the previous learning steps into the 3D space and specialized applications related to anisotropy, seismic applications of geomechanics, plasticity and salt and drilling optimization.
- Petrel Reservoir geomechanics classes provide the technology training to perform full-field geomechanics modeling.

GEOMECHANICS FOR UNCONVENTIONAL

The geomechanics training program for unconventionals combines geomechanics, hydraulic fracture design and acoustic log interpretation. This provides a team of subsurface specialists and production engineers with an integrated learning experience focussed on geomechanics related aspects of shale gas and other unconventionals.

DESCRIPTION OF COURSE PROGRESSION

- Fundamentals of geomechanics introduces the subject and its various applications in the petroleum cycle from exploration, appraisal through to development and production and can be provided as a blended class using Techlog Geomechanics.
- Specific Geomechanics classes for each type of unconventional resource (shale gas, heavy oil or coal-bed methane) introduce the specific geomechanics aspects for production in each case.
- Mangrove-related software training classes provide specific knowledge related to the latest Schlumberger Hydraulic Fracture design technology, which includes geomechanics stress modeling capabilities.
- Techlog Acoustic processing introduces the basic processing and interpretation steps of acoustic logs using the Techlog software suite.
- Rock physics and Practical aspects of acoustics provide domain and software knowledge related the use of anisotropy particularly in shale gas applications.

GEOMECHANICS FOR DRILLING

The geomechanics training program for drilling provides a combination of training classes for drilling engineers to provide an integrated learning experience combining geomechanics domain, pore pressure, drilling hazards and software classes. It is tailored to help a drilling department working with an asset team to integrate geomechanics into their well delivery workflows, both in the planning phase and in the operations phase.

DESCRIPTION OF COURSE PROGRESSION

- Fundamentals of geomechanics introduces the subject and its various applications in the petroleum cycle from exploration, appraisal through to development and production.
- The Pore pressure and/or Geohazards courses focus on pore pressure and drilling hazard studies necessary for efficient planning and safe drilling of planned wells The stuck-pipe and Hole cleaning class brings the wellbore stability theory from the fundamental geomechanics class into the drilling context of hole cleaning practices and drilling optimization.
- The advanced geomechanics class covers specialized topics related to geomechanics aspects of lost circulation, wellbore strengthening, bit-rock interaction and drilling fluids.
- The Techlog pore pressure and wellbore stability class provides hands-on training on the Schlumberger software technology to provide well-centric geomechanics modeling capabilities.

COMBINED SUBSURFACE AND DRILLING PROGRAM

- The subsurface and drilling program can be combined to provide an integrated asset team with a joint learning experience. Hereby the drilling engineers will join the subsurface team for parts of the training program that are relevant to drilling operations, whereas the subsurface team receives a wider spectrum of training also in reservoir geomechanics and acoustic geomechanics aspects.
- This combined program will enable an integrated asset team to build geomechanics and wellbore stability modeling into their well delivery workflows from planning to execution, as well as provide the subsurface team with a basic understanding of reservoir geomechanics effects.

Drilling Engineering Training Programs

DEEPWATER DRILLING

The progression path has been designed to enhance the knowledge of drilling professionals to understand terminology, concepts, processes and equipment used to drill Deepwater oil & gas wells. The interaction with the software knowledge and its application provides a powerful simulation tool for effective risk management and planning for well control. Modeling temperature, gas solubility, gas migration and other PVT aspects are key elements for supporting the well planning and execution of drilling Deepwater operations.

DESCRIPTION OF COURSE PROGRESSION

- Deepwater Foundation; overall awareness of the deepwater environment, MODUs, and challenges of wells in deepwater.
- Drillbench Dynamic Hydraulics and Temperature modeling; understanding the hydraulics and temperature modeling software and run dynamic simulations.
- Mangrove-related software training classes provide specific knowledge related to the latest Schlumberger Hydraulic Fracture design technology, which includes geomechanics stress modeling capabilities.
- Deepwater Drilling Design and Operations; the course will follow a typical Deepwater drilling program and drilling process from geology, station keeping, rig selection, rig equipment, wellhead, BOP, marine riser, conductor driving and surface casing setting, through the remainder of the well, with additional discussion of the challenges of testing, completions, interventions, and operations management.
- Deepwater Geohazards; geological, geophysical and geomechanical aspects, their prediction and mitigation.
- Drillbench Dynamic Well Control Modeling; understanding the presmod kick software, run a dynamic well control simulation.
- Deepwater Completions; understanding of the key drivers and challenges in Deepwater completions, including discussion of tree types,MODU and fixed installation concerns, and risers.
- Drillbench Blowout Control; principles and concepts related to blowout control operations, overview of tertiary well control options, and basis of relief well planning and dynamic well kill operations for blowout wells.
- Deepwater Well Project and Risk Management; the course will follow the well project management process from prospect evaluation through operations and close out, and will address risk management from risk identification and analysis through operational techniques for managing risk, giving participants understanding of the challenges, choices and compromises necessary to manage deepwater well projects.

GEOMECHANICS FOR DRILLING

The geomechanics training program for drilling provides a combination of training classes for drilling engineers to provide an integrated learning experience combining geomechanics domain, pore pressure, drilling hazards and software classes. It is tailored to help a drilling department working with an asset team to integrate geomechanics into their well delivery workflows, both in the planning phase and in the operations phase.

DESCRIPTION OF COURSE PROGRESSION

- Fundamentals of geomechanics introduces the subject and its various applications in the petroleum cycle from exploration, appraisal through to development and production.
- The Pore pressure and/or Geohazards courses focus on pore pressure and drilling hazard studies necessary for efficient planning and safe drilling of planned wells The stuck-pipe and Hole cleaning class brings the wellbore stability theory from the fundamental geomechanics class into the drilling context of hole cleaning practices and drilling optimization.
- The advanced geomechanics class covers specialized topics related to geomechanics aspects of lost circulation, wellbore strengthening, bit-rock interaction and drilling fluids.
- The Techlog pore pressure and wellbore stability class provides hands-on training on the Schlumberger software technology to provide well-centric geomechanics modeling capabilities.

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 matured 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.

Artificial Lift Engineering Training Program

The Artificial Lift training program has been designed to provide a combination of technical and software classes for Production Engineers in order to enhance

the knowledge using a consistent interconnected learning experience combining, theory, practice (using physical simulators and appropriate software. NODAL systems analysis use is stressed for lifting performance optimization of oil and gas wells.

DESCRIPTION OF COURSE PROGRESSION

- Artificial Lift Technology provides a strong foundation of the most popular artificial systems currently in use.
- Integrated Production and Well Operations (Integrated Production and Well Operations Modeling) will simulate the operation of different artificial lift systems used to produce oil under several operating conditions and their effect on the production system. Water and air are used to simulate two-phase flow (oil and gas).
- Pipesim (Pipesim Fundamentals) general understanding of how PIPESIM software is used to design and optimize total production systems from the reservoir to the final processing delivery point.
- Nodal Analysis using Pipesim provides a powerful tool for the analysis of the different components of a production system on an integrated approach for production optimization, troubleshooting, design of artificial lift systems, etc.
- Completion and Production Engineering (Sucker Rod Pumps - Application Engineering) emphasizes the role of the Well, as part of the Integrated Production System for a Hydrocarbon Asset. Well Completion design concepts and the technical selection criteria of packers, tubing, wellheads, wells candidates for sand control and acidizing, etc.
- OLGA Simulator (Olga Flow Assurance) is one of the principal components in analysis of pipeline operations. The OLGA Three Phase program base can solve most of the normal challenges associated with pipeline flow.
- Sucker Rod Pumps covers describes the function of each component of the system. Standard and special applications, design, diagnosis, troubleshooting and optimization are described and discussed.
- Progressive Cavity Pumps the theoretical and practical knowledge of the advantages and limitations are key for proper design, optimization and troubleshooting of this artificial lift system. Its applications cover very low downhole pressure wells, solids handling and viscous oils.
- Gas Lift (Design, Diagnosis and Optimization of Gas Lift Systems) basic principles, selection of the equipment, types, design, monitoring, etc, of continuous and intermittent gas lift systems to analyze and design any artificial lift system by using a continuous or intermittent gas flow rate.
- Electric Submersible Pumps – Practical (Electric Submersible Pumps - Application Engineering - Practical Training) provides theoretical and practical knowledge of the advantages and limitations of the Electric Submersible Pumps in order to develop the required skills to design, optimize and diagnose wells producing with Electric Submersible Pumps.
- Electric Submersible Pump – Advanced (ESP - Advanced) provides recommendations for designing ESP systems for special applications including gassy wells, production of fluids with solids, viscous oil, dual completions, Ytool applications, shrouded motors, production through the annular, high temperature and recirculation.

Health, Safety and Environment Training Programs

HSE defines the principles by which organizations conduct their operations worldwide. Organizations today demonstrate their commitment to the highest standards of health and safety for their employees, customers, and contractors as well as to the protection of the environment and communities. NExT provides a wide range of training programs related to this important subject to ensure organizations are up to date in compliance and performance.

Health, Safety and Environment Training Program for General Employee / Newcomer Group

- An HSE training program designed to take a Newcomer (Field or Office Employee) from Awareness Level induction to Middle Management Level accountability for general HSE / Security.
- Description of courses (each is stand-alone w/o prerequisites):
  - Newcomer Employee Workplace Safety is designed for all new-hires, office or field.
  - Advanced Driving Skills assumes an employee can already drive a vehicle and it teaches advanced accident prevention techniques. This addresses the top cause of fatality in most oil & gas sector companies.
    - Course involves both classroom and in-vehicle training.
  - Stepping, Handling & Lifting Techniques addresses the top cause of non-fatal lost time injuries in the oil & gas sector.
    - Office version teaches workstation ergonomics.
    - Field version addresses the typical workshop / wellsite activities and hazards.
  - HSE for Front-Line Supervisors in Oil & Gas Exploration & Production is the course that teaches the fundamentals of HSE supervision at a worksite. Can be used by both office and field supervisors.
    - This course is taken before or soon after promotion to jobsite supervisor.
  - QHSE for Line Managers teaches the next level of leadership and accountability for HSE management.
    - This course is taken before or soon after promotion to the Line Management role.

Health, Safety and Environment Training Program for Operations Professional Development

- An HSE training program designed to develop technical and line management operations staff (Field or Engineering Employee) on specific topics necessary for corporate risk control and employee professional development.
- Description of courses (each is stand-alone w/o prerequisites):
  - Oil Spill Response & Control is a classroom study of the prevention, preparedness and response to spills.
  - Human Error Management gives degreed Engineers insight into the soft skills of managing PEOPLE.
  - HAZOP/HAZID and SIL teaches technical staff the methods of Hazard Analysis using HAZOP & HAZID and an introduction to Safety Integrity Level determination.
  - Root Cause Analysis is a practical classroom coverage of investigation and root causation methodology. It is designed to make Engineers/Managers competent to direct an effective post incident investigation to root cause.
  - Drilling Project & Risk Management course is designed so participants will better understand how to identify, quantify, and manage risk in the Oil & Gas Drilling industry.
  - Emergency and Crisis Management in the Offshore Oil & Gas Environment is an extended case study of the Macondo/Deepwater Horizon incident of 2010. It explores the barriers to a major incident and how to assure the barriers remain intact on similar wellsite operations, especially offshore. It makes extensive use of workshops and team-based efforts.

Health, Safety and Environment Training Program for HSE Specialists

- An HSE training program designed to develop internal HSE Staff. This program assumes no existing HSE-technical credentials. In cases of prior experience, the lower level courses can be skipped. In cases of a group of HSE staff to be trained together, the delegates can take the classes sequentially as a group. In the case of a single HSE person to be developed in the shortest timeframe, this program has been administered in a one-on-one Mentoring format for up to 30 days.
- Description of General Sequence courses (each is stand-alone w/o prerequisites): This package mirrors the above General Employee/Newcomer Group. For HSE staff it is not only important that they know this content, but also that they know what the general population is taught.
  - Newcomer Employee Workplace Safety is designed for all new-hires, office or field.

- Advanced Driving Skills assumes an employee can already drive a vehicle and it teaches advanced accident prevention techniques. This addresses the top cause of fatality in most oil & gas sector companies.
  - Course involves both classroom and in-vehicle training.
- Stepping, Handling & Lifting Techniques addresses the top cause of non-fatal lost time injuries in the oil & gas sector.
  - Office version teaches workstation ergonomics.
  - Field version addresses the typical workshop / wellsite activities and hazards.
- HSE for Front-Line Supervisors in Oil & Gas Exploration & Production is the course that teaches the fundamentals of HSE supervision at a worksite. Taking this course allows HSE staff to be able to observe HSE management behaviors among supervisory staff and give feedback and coaching to them.
- QHSE for Line Managers teaches the next level of leadership and accountability for HSE management. Again, the value to HSE professionals is that they learn the content and are thus able to observe and intervene with Line Managers on HSE issues.

HSE Training Program for HSE Professionals

- An HSE training program designed to develop internal HSE Staff. This program assumes the delegates are practicing HSE professionals of various experience levels and credentials. In these cases it would be typical to take the specific course or sequence of courses that are required to gain specific skill development or program implementation.
- In the case of an internally recruited HSE Specialist, he or she would complete the HSE Specialist Program before commencing these Professional courses.
- Description of HSE Professional Development courses (each is stand-alone w/o prerequisites): This package allows a developing HSE staff to select topics on a risk-based/as-needed approach.
- In the case of an internally recruited HSE Specialist, he or she would complete the HSE Specialist Program before commencing these Professional courses.
  - Oil Spill Response & Control is a classroom study of the prevention, preparedness and response to spills.
  - Human Error Management is essentially a behavior-based safety course..
  - HAZOP/HAZID and SIL teaches the methods of Hazard Analysis using the HAZOP & HAZID and an introduction to Safety Integrity Level determination.
  - Root Cause Analysis is a practical classroom coverage of investigation and root causation methodology. It is an essential skill for HSE professionals.
  - Drilling Project & Risk Management course is designed so participants will better understand how to identify, quantify, and manage risk in the Oil & Gas Drilling industry. This would be an essential course for an HSE professional who does not have an oil & gas background.
  - Emergency and Crisis Management in the Offshore Oil & Gas Environment is an extended case study of the Macondo/Deepwater Horizon incident of 2010. It explores the barriers to a major incident and how to assure the barriers remain intact on similar wellsite operations, especially offshore. It makes extensive use of workshops and team-based efforts.
- Fundamentals of Groundwater Contamination prepares an Oil & Gas professional for the management of groundwater issues.
- Information Security for Industrial Systems is an overview of the IT security aspects of an HSE professional's security responsibilities.
- Dropped Object Training follows the format of the Dropped Objects Prevention Scheme Global Resource Centre.
- H^2S in the Oil & Gas Sector teaches the specific hazards and overall risks from H^2S.
- Hazardous Areas Classification and Installation teaches the characteristics of flammable environments and the technology requirements to operate in them.
- Incident investigation & Auditing Skills teaches the practical (team-member level) skills of evidence-based Investigation and auditing, including interviewing, report-writing and action planning.
- Radiation Safety Officer Training teaches the UK or US regulatory requirements for use of chemical radioactive sources in the oil & gas sector.

Health, Safety and Environment Training Program for Stepping, Handling & Lifting Progression

- An HSE training program designed to allow a company to implement a proven remedy for the Stepping, Handling & Lifting (Slips, Trips & Falls plus General Personal Injury) category of accidents. This category typically produces the most number of non-fatal lost-workday cases in oil & gas. This program requires no prerequisites and assumes no specific expertise on the part of the delegates/ trainees beyond general practical experience in their job roles. This progression can be implemented using NExT Instructors initially, and as the value of the program is recognized, internal staff can be trained to self-sustain the program.
- Description of Course Sequence:
- In the case of an internally recruited HSE Specialist, he or she would complete the HSE Specialist Program before commencing these Professional courses.
  - Field version Stepping, Handling & Lifting Techniques addresses the top cause of non-fatal lost time injuries in the oil & gas sector.
  - Office version Stepping, Handling & Lifting Techniques addresses the top cause of non-fatal lost time injuries in the oil & gas sector.
  - Commentary Task Coach School: A Commentary Task Assessment is a formal behavioral observation / intervention exercise in which someone trained in the Stepping, Handling & Lifting Techniques, is evaluated on their use of these techniques by a trained Observer/Coach.
  - Stepping, Handling, & Lifting Techniques Instructor: Implemented in companies that want to teach the Field & Office versions above.
  - Master Trainer: Implemented in companies that want to be able to completely self-sustain a Stepping, Handling & Lifting program.

Unconventional Resources Training Programs

'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.

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

Geomechanics for Unconventionals

GEOMECHANICS FOR UNCONVENTIONAL

The geomechanics training program for unconventionals combines geomechanics, hydraulic fracture design and acoustic log interpretation. This provides a team of subsurface specialists and production engineers with an integrated learning experience focussed on geomechanics related aspects of shale gas and other unconventionals.

DESCRIPTION OF COURSE PROGRESSION

- Fundamentals of geomechanics introduces the subject and its various applications in the petroleum cycle from exploration, appraisal through to development and production and can be provided as a blended class using Techlog Geomechanics.
- Specific Geomechanics classes for each type of unconventional resource (shale gas, heavy oil or coal-bed methane) introduce the specific geomechanics aspects for production in each case.
- Mangrove-related software training classes provide specific knowledge related to the latest Schlumberger Hydraulic Fracture design technology, which includes geomechanics stress modeling capabilities.
- Techlog Acoustic processing introduces the basic processing and interpretation steps of acoustic logs using the Techlog software suite.
- Rock physics and Practical aspects of acoustics provide domain and software knowledge related the use of anisotropy particularly in shale gas applications.

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 evaluation and production 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)

For inquires about this program please contact your regional office at:.

USA- Email: NExT-NAM@slb.com

Canada- Email: NExT-Canada@slb.com

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 three 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 profitable development strategy.

FDP Comprehensive Program

WEEK 1

Fundamentals of FDP

This course will provide the participants with an opportunity to learn the fundamental approaches in constructing a Field Development Plan (FDP). The course introduces the workflow required for initial development plan followed by updates with changing reservoir conditions. This may include introducing secondary and tertiary development to improve recovery factors. Participants are also exposed to the importance of reservoir monitoring and need for updating the reservoir development with the changing reservoir conditions.

WEEK 2-6

General Geology Compartments

This is a comprehensive and applied course in depositional systems of clastic reservoirs using

- Current structure map
- Seismic cross-section(s)
- Representative petrographic photos and SEM photos
- Representative detailed core photos
- A current 3-D block diagram, with the depositional environment

4-D Seismic

This is a comprehensive and applied course in 4D Seismic. 4D Seismic applications are covered. Value of 4D seismic Case studies 4D seismic as an aid for improving the structural interpretation Mapping by-passed oil Mapping pressure changes Combining surface seismic and OBS data in 4D evaluations.

Understand/Build Static Model

Petrel Fundamentals will be covered as an introduction to this section. The participants will learn the basic of constructing top structures with the use of well log data in Petrel. They will learn how to make a cross section display with specific wells and specific curves; along with developing a basic map display of key surface inputs that go into developing the static geocellular model and upscaling of the data. This should take two days of Petrel instruction.

Participants will study what information is required to build a Geological Static Model, such as Petroleum Geology, Subsurface Mapping, Petrophysical Analysis and Geostatistics. The Students will be provided with the initial data which they will use in a hands on practical approach to build the static model with the use of Petrel.Static model is the expected outcome of this module.

Permeability Prediction

This workshop is designed for participants to learn and discuss regression methods, quality of fit and different averaging methods, SW independent permeability prediction methods and SW dependent permeability prediction methods, Apply core log permeability calibrations Compare base permeability to log calculated Sw Demostrate the Kipling Approach. NExT method on Saturation - Height modeling.

WEEK 7

Volumetrics

First the calculation methodology will be discussed. Then HC volumes for the field under investigation will be estimated by using deterministic and probabilistic techniques with inclusion of risk analysis . The output of this workshop will be the reserves estimation by analyzing the fluid contacts, petrophysical rock types (P10-P90 analysis) and flow unit properties used in static model creation.

WEEK 8

Fluid Properties and Phase Behavior

After instruction on PVT properties and phase behavior; PVT data on fluid properties and phase behavior will be reviewed and analyzed. The outcome of this workshop will be the necessary information for dynamic model preparation.

WEEK 9-10

Well Test Analysis

Well Test analysis methods will be taught and discussed during the first day. During the workshop the participants will analyze well tests from the selected wells which are under investigation. The main outcome of this workshop will be the reservoir pressure, drainage area boundaries, production capacities of each well bore, formation damage information and the information regarding the type of porous system.

PETREL Reservoir Modeling and Upscaling

First PETREL RE programming and usage will be taught during the first two days. The main target is to prepare participants to the next step of Reservoir modeling. Then the development of the dynamic model of the reservoir under investigation will be started. During this workshop, participants will do 3D PETREL Reservoir Modeling and Upscaling.

WEEK 11-12

Reservoir Model Calibration/History Matching

The main target is to finalize the development of the dynamic model of the reservoir under investigation. During this workshop PETREL Reservoir Model Calibration/ History Matching will be carried out. The outcome will be a representative dynamic model of the field under investigation.

WEEK 13

Well Placement and Production Optimizations

The goal of this workshop is first

a)to introduce the concept of geological well placement (geosteering) and provide 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,

b)and provide the knowledge on integrated subsurface–surface production optimization. The participant then will apply this knowledge to their field under investigation. Output will be the possible new well locations and the expected optimum production rates to be used in Development scenarios workshop later.

WEEK 14-16

Development Scenarios

During this workshop three different Field Development Scenarios will be prepared and worked on by different teams. The predicted production profiles wil be the main target of the workshop. First 3 days of instruction will acquaint engineers, geoscientists, and operating personnel with the basic techniques used in modern reservoir management by asset management teams and to improve understanding of EOR and IOR processes and monitoring best practices

WEEK 17

Introduction to Drilling, Well Design and Completion

The first two days instruction will provide participants the principles of drilling, well design and c ompletion activities. The following workshop will target application of this knowledge to their development sceneraios.

Introduction to Surface Facilities

The principles of surface facilities will be discussed during theoritical part and the workshop will provide the basic knowledge of surface facilities from the wellhead to the custody transfer. The participants will study the possible surface facility requirements for their field with inclusion of the necessary cost analysis. Some aspects of HSE will also be discussed.

Introduction to Petroleum Economics

The principles of Petroleum Economics will be discussed during the first day of instruction and during the workshop participants will work on real case economic analysis to get prepared for the next workshop.

WEEK 18

Financial Analysis of the Development Scenario

Economical analysis of the development scenarios will be carried out for management presentations

Report Documentation, final presentations showing added value and products

FDP Accelerated Program

WEEK 1-3

Program Orientation and Introduction to FDP

This one day introduction will provide the participants with an opportunity to learn the fundamental approaches in constructing a Field Development Plan (FDP). The workflow that is required for initial development plan followed by updates with changing reservoir conditions will also be introduced. This may include introducing secondary and tertiary developments to improve recovery factors. Participants will also be exposed to the importance of reservoir monitoring and the need for updating the reservoir development with the changing reservoir conditions.

Understand/Build Static Model

Participants will study what information is required to build a Geological Static Model, such as Petroleum Geology, Subsurface Mapping, Petrophysical Analysis and Geostatistics.

Petrel Fundamentals will be covered as an introduction to this section. The participants will learn the basic of constructing top structures with the use of well log data in Petrel. They will learn how to make a cross section display with specific wells and specific curves; along with developing a basic map display of key surface inputs that go into developing the static geocellular model and upscaling of the data.

The participants will be put in teams of 4-5 and will be provided with the initial data which they will use in a hands on practical approach to build the static model via Petrel. They will actually attempt to build the static model. At the end of this module a generic static model using the same data will be distributed for future work. This will be done in any case even if some teams are able to come up their own static model.

Volumetrics

Initial calculation methodology will be reviewed and discussed. Then the reserves for the field under investigation will be estimated by using deterministic and probabilistic techniques with inclusion of risk analysis . The output of this workshop will be the reserves estimation by analyzing the fluid contacts, petrophysical rock types (P10-P90 analysis) and flow unit properties used in static model creation. The results will be compared with the volumes calculated during static model creation.

WEEK 4

Fluid Properties and Phase Behavior

After instruction on PVT properties and phase behavior; PVT data on fluid properties and phase behavior will be reviewed and analyzed. The outcome of this workshop will be the necessary information for dynamic model preparation.

Well Test Analysis

Well Test analysis methods will be taught and discussed during the first day. During the workshop the participants will analyze well tests from the selected wells which are under investigation. The main outcome of this workshop will be the reservoir pressure, drainage area boundaries, production capacities of each well bore, formation damage information and the information regarding the type of porous system.

WEEK 5

3D Reservoir Modeling and Upscaling

PETREL RE programming and usage will be taught during the first two days. Then the development of the dynamic model of the reservoir under investigation will be started. During this workshop, participants will do 3D PETREL Reservoir Modeling and Upscaling.

Reservoir Model Calibration/History Matching

The main target of this module is to finalize the development of the dynamic model for the reservoir under investigation. During this workshop PETREL Reservoir Model Calibration/History Matching will be carried out. The outcome will be a representative dynamic model of the field under investigation. At the end of this module a generic Dynamic model using the same data will be distributed in case the teams can not complete the dynamic model construction.

WEEK 6-7

Well Placement and Production Optimizations

The goal of this workshop is first a)to introduce the concept of geological well placement (geosteering) and provide 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, b)and provide the knowledge on integrated subsurface–surface production optimization. The participant then will apply this knowledge to their field under investigation. Output will be the possible new well locations and the expected optimum production rates to be used in the next module of Development scenarios.

Development Scenarios

During this workshop three different Field Development Scenarios will be prepared and worked on by the teams. The predicted production profiles will be the main target of the workshop.

WEEK 8

Financial Analysis of the Development Scenarios

The principles of Petroleum Economics will be discussed during the first half day and economical analysis of the development scenarios will be carried out for management presentations during the workshop.

Report Documentation, final presentations showing added value and products

FDP Rapid Program

WEEK 1-2

Program orientation and Introduction to FDP

This one day introduction will provide the participants with an opportunity to learn the fundamental approaches in constructing a Field Development Plan (FDP). The workflow that is required for initial development plan followed by updates with changing reservoir conditions will also be introduced. This may include introducing secondary and tertiary developments to improve recovery factors. Participants will also be exposed to the importance of reservoir monitoring and the need for updating the reservoir development with the changing reservoir conditions.

Understand/Build Static Model

Participants will study what information is required to build a Geological Static Model, such as Petroleum Geology, Subsurface Mapping, Petrophysical Analysis and Geostatistics. The participants will be provided with the initial data, which they will use in a hands on practical approach to build the static model via Petrel. At the end of this module a generic static model using the same data will be distributed for future work.

Volumetrics

Initial calculation methodology will be reviewed and discussed. Then the reserves for the field under investigation will be estimated by using deterministic and probabilistic techniques with inclusion of risk analysis . The output of this workshop will be the reserves estimation by analyzing the fluid contacts, petrophysical rock types (P10-P90 analysis) and flow unit properties used in static model creation. The results will be compared with the volumes calculated during static model creation. (Petrophysic Rock-types, flow units, Sw vs Height models)

Fluid Properties and Phase Behavior

After instruction on PVT properties and phase behavior; PVT data on fluid properties and phase behavior will be reviewed and analyzed. The outcome of this workshop will be the necessary information for dynamic model preparation.

Well Test Analysis

Well Test analysis methods will be taught and discussed during the first day. During the workshop the participants will analyze well tests from the selected wells which are under investigation. The main outcome of this workshop will be the reservoir pressure, drainage area boundaries, production capacities of each well bore, formation damage information and the information regarding the type of porous system.

WEEK 3-4

3D Reservoir Modeling and Upscaling

The main target is to start the development of the dynamic model of the reservoir under investigation. During this workshop, participants will work on 3D Reservoir Modeling and Upscaling.

Reservoir Model Calibration/History Matching

Within this module the participants will finalize the development of the dynamic model for the reservoir under investigation. During this workshop Reservoir Model Calibration/History Matching will be carried out. At the end of this module a generic Dynamic model using the same data will be distributed for future work.

Well Placement and Production Optimizations

The goal of this workshop is first a)to introduce the concept of geological well placement (geosteering) and provide 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, b)and provide the knowledge on integrated subsurface–surface production optimization. The participant then will apply this knowledge to their field under investigation. Output will be the possible new well locations and the expected optimum production rates to be used in the next module of Development scenarios.

Development Scenarios

During this workshop three different Field Development Scenarios will be prepared and worked on by different teams. The predicted production profiles will be the main target of the workshop.

Financial Analysis of the Development Scenarios

Economical analysis of the development scenarios will be carried out for management presentations.

Report Documentation, final presentations showing added value and products

Flow Assurance Training Program

The flow assurance training program provides the participants a deep understanding of the Impediment to flow caused by either fluid phase behavior coupled with the dynamics of flow and/or production-chemistry-related issues in the wellbores, well, flow lines and processing facilities. The program includes a combination of theoretical classes with practical exercises and case studies on how to identify, prevent, control and remediate the problems caused by the behavior of the fluids from pore to process. The interaction with software knowledge and its application provides step-by-step instructions to build and run steady state and transient simulation models on flow assurance.

DESCRIPTION OF COURSE PROGRESSION

- Introduction to flow assurance: Understanding of the major problems associated with the deposition of, asphaltenes, paraffins, emulsion, and scales, hydrates and corrosion.
- Multiphase Flow: Understanding multiphase theories, flow pattern and how to do pressure drop calculations for multiphase flow, sluggish and transient flow considerations.
- PIPESIM Fundamentals: Provides steady-state, multiphase flow simulation for oil and gas production systems.
- Olga Flow Assurance: dynamic multiphase flow simulator is used to understand and solve typical flow assurance challenges.
- Practical Flow Assurance Using Transient OLGA Simulation: key impediments to flow, including slugging and precipitation of organic and inorganic solids, with examples from various challenging environments.
- Olga Well Dynamic: simulate the flow transients in the wells and production systems.
- Assuring Flow From Pore to Process: Basics, Modeling, and Lab: holistic approach to flow assurance, introduce technologies, work-flows, and their deployment for the identification, characterization, and management of flow impediments

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.

Industry and academia collaboration

TAKE THE NEXT STEP IN YOUR CAREER

NExT, in conjunction with Heriot-Watt University, offers a suite of courses for the next step in your career development. Developed with working professionals in mind, the workshops provide guided learning to enhance and add to your professional development

BENEFITS INCLUDE:

- World class education from Heriot-Watt University.
- Curricula designed for working professionals focused on technical and business fundamentals that builds a foundation for strategic decision making.
- Opportunities to share experiences with other oilfield professionals to gain a broader management perspective.

PetroChallenge

PetroChallenge is a two day educational event for either university or senior high school students, with the purpose of developing the students' knowledge of the oil and gas industry and their interest in pursuing professional careers in the industry or relevant higher education choices.

PetroChallenge utilizes the upstream learning simulator, OilSim, in which teams compete and collaborate to discover and develop hydrocarbons. OilSim is also used by industry to train professionals in technical and non-technical disciplines like geology, geophysics, project management, strategy, decision making and teamwork.

University students participate in challenges involving the whole upstream value chain, whereas events for schools have a one day training day and then an intense competition on day two involving the exploration challenges.

ABOUT OILSIM: UPSTREAM LEARNING SIMULATOR

The OilSim* upstream learning simulator takes users through the entire exploration and production business process—from acquiring a block to its development, production, and abandonment.

OilSim is used to train multidisciplinary courses at NExT such as:

- Introduction to Management of E&P Business with OilSim
- Project Management Fundamentals
- Oil and Gas Business Simulation with OilSim
- Introduction to Petroleum Exploration and Production with OilSim
- Introduction to Geology with OilSim
- Introduction to Geophysics with OilSim
- Introduction to Shale Reservoirs with OilSim

More than 40,000 participants have been instructed in disciplines covering exploration, development, and production activities using OilSim.

The audience includes new hires to middle management and functions. Clients trained on OilSim include ADCO, Exxon Mobil, PDO, ENI, BG Group, Statoil.

WHAT MAKES PETROCHALLENGE UNIQUE?

- The simulator can take users through the entire exploration and production business process—from acquiring a block to its development, production, and abandonment unlike other competitions which only focus on a particular discipline.
- This event bridges the industry with academia and offers hands-on engagement with potential employees.
- It involves educational institutions and helps them to demonstrate their continued commitment to embrace new learning technologies that help prepare students for industry.
- PetroChallenge offers sponsors the opportunity to use the event publicity to help deliver a broader appreciation of the industry to the participants, wider communities, and wider society.
- It offers a platform for an excellent team working experience, developing collaborative skills and understanding competition in a simulated 'real-life setting'.
- Participating in this event encourages students to demonstrate the need for both specialized technical and team based skills in an environment that requires thinking across different knowledge domains.
- Students' teams are created by organizers, encouraging networking and communication skills.
- Each event is led by trained PetroChallenge instructors, there to encourage peer-to-peer knowledge and skill transfers amongst the teams.
- Even though it uses an online simulator, no downloads are required.

STRUCTURE

- PetroChallenge utilizes the upstream learning simulator OilSim in which teams compete and collaborate to discover and develop hydrocarbons.
- Students can participate in one regional PetroChallenge competition per year. Teams are not allowed to have non-team members do PetroChallenge work for them during the competitions.
- The datasets provided in the OilSim simulator are synthetic and do not represent any real world geological locations.
- The datasets may only be used during the PetroChallenge competition, and must not be retained after the competition.

Sponsorship

PetroChallenge is sponsored by the oil and gas industry, educational institutions and energy authorities.

There are three sponsorship levels as outlined below.

- Gold
- Silver
- Bronze

WHY IS PETROCHALLENGE AN ASSET FOR YOUR ORGANIZATION?

FOR UNIVERSITIES:

- Acting with confidence – investing in future of the industry
- See possible recruits in action
- Sustain relationships with universities
- Engage with next generation
- Theoretical studies brought to life

FOR SCHOOLS:

- A united industry front – looking confidently to the future in difficult times
- School students today are potential recruits in 5-8 years
- Sustaining commitment to communities they operate in
- Encouraging degrees in suitable subjects
- Transferable skills within Energy industry

SPONSORSHIP BENEFITS

SPONSORS

EXECUTIVE AND SENIOR MANAGEMENT

- Local capability development

HUMAN RESOURCE

- Strengthen links between the industry, educational establishments and the future workforce

- Bridge the gap between theoretical studies and the industry
- Hands on Technical engagement with potential recruits.
- Promotes company as a potential employer

CORPORATE SOCIAL RESPONSIBILITY

- Developing people by promoting education
- Encourage excellence in the industry's future workforce

MARKETING

- Raises company's profile
- Promote new and existing products and service offerings
- Promote brand awareness with future customers

Competition Rules

The rules stated below are intended to offer the best experience for all stakeholders involved in a PetroChallenge competition (the "Event") and provide fairness to all competitors. Any violation of these rules may result in the disqualification of the student(s) involved, at the sole discretion of the NExT PetroChallenge organizers.

STUDENT AND TEAM RULES

- Students must complete and sign a Student PetroChallenge Registration form, providing all information requested and accepting the terms of participation as shown on the Terms and conditions page.
- Teams may only comprise full-time students attending the participating university or school.
- Teams consist of 3 or 4 persons. NExT organizers have the discretion to consolidate smaller teams where necessary into teams of up to 4 people.
- If a participant registers by himself/herself, the PetroChallenge organizers will place the student(s) into a team, and endeavor to mix the area of study, gender and age, where appropriate and possible.
- All team members must be present for the team to be eligible to compete.
- Students are eligible to participate in only one PetroChallenge competition per year, excluding any regional finals.
- All participants will be informed of their team numbers at registration on day 1 and remain members of this team throughout the whole competition unless otherwise instructed by the event organizers.
- Teams may not seek or receive assistance from non-team members during the Event, unless authorized instructors or assistants at the event.
- Teams may not change team members between the university/school and any regional final.
- Students must at all times adhere to a professional level of behavior in dress, conduct, language and decorum.
- Each team has access to 2 laptops or PCs. If additional computer hardware is used by a team they may be disqualified. Mobile phone devices can be used only for their calculator capabilities.
- Teams are not to make use of Facebook or any BitTorrent software during the Event. These programs work in a similar way to the OilSim software and have an extremely detrimental effect on the performance of OilSim and the experience of the users. If a team is found to be doing so, this can lead to disqualification.

OILSIM ACCESS RULES

- In the unlikely event of finding a bug, computer virus, technical failure or any other system error that might corrupt or affect the overall outcome of the Event, the student is responsible for reporting the finding to the NExT organizers, regardless of whether it is within or outside the control of NExT.
- If any suspicious behavior by a team becomes apparent within the simulation, NExT reserves the right at its sole discretion, to disqualify or void any individual/individuals who appear to be exploiting an unforeseen and unreported error in the simulation.
- These OilSim login details are unique to each team participating and if misplaced or shared, could cause unfair and disruptive activity within the simulation. Therefore, they must be treated with the utmost confidentiality, and it is the responsibility of each team member to protect these details for the duration of the competition.
- The datasets provided in the OilSim simulator are synthetic and do not represent any real world geological locations. These may only be used during the Event, and must not be retained after the competition.

Testimonials

It is fun and very educational. I really enjoyed the fact that it was simple enough to understand, but challenging enough to keep it interesting.

Norway PetroChallenge 2016, Stavanger

I learned how to work under pressure and work in difficult situations I learned that I work well with groups and that teamwork is better than individual work.

IPAA/PESA PetroChallenge 2016, Houston, Texas

It not only teaches you about the petroleum industry and gives you an accurate working experience but it also teaches you team work.

IPAA/PESA PetroChallenge 2016, Houston, Texas

PetroChallenge is interesting, real to life situation that required intensive thinking and educated me about the petroleum industry.

IPAA/PESA PetroChallenge 2016, Houston, Texas

This challenge was one of the only parts in my high school career where I had to think out of the box and like an entrepreneur unlike methodically like taught in school.

IPAA/PESA PetroChallenge 2016, Houston, Texas

I enjoyed learning about the multiple disciplines and how everything relates. As a geologist, I enjoyed learning about the financial side and the engineering aspects of the oil and gas industry from both the course itself and my team mates, as well as also passing my knowledge on to others in my team to help solve the puzzles. The course was also very fun, interactive, as well as challenging, which I loved, as there weren't any challenges which were boring or too easy

PNZ PetroChallenge 2016, Auckland, New Zealand

The whole process that contains almost everything that runs an oil and gas company, from the geology to the final production step, it is so cool to know all this and have an expectation to what will be happened in the real life.

Rice PetroChallenge 2016, Houston, Texas

I liked interacting with my teammates and other teams in a business aspect. I enjoyed how realistic the PetroChallenge was and relative to the major I am taking at University

Penn State PetroChallenge 2016, State College, Pennsylvania)

I liked the variety of challenges that we faced as teams. Also, I liked the decision-making experience as an oil company.

Penn State PetroChallenge 2016, State College, Pennsylvania

Contacts

GENERAL INFORMATION

Paula Kelly

PKelly8@slb.com

Debbie Williams

DWilliams45@slb.com

www.nexttraining.com

Petroleum Engineering

INTENSIVE CLASSROOM BASED WORKSHOPS

NExT is pleased to be able to offer a range of intensive classroom based workshops, led by Heriot-Watt University academic staff. These workshops are ideal for career minded individuals looking to develop their skill set. The workshops provide guided learning for professionals looking to enhance and add to their own professional development.

The 5-day instructor-led workshops are scheduled every year. Each of the workshops is taught by academic members of staff from the Institute of Petroleum Engineering, Heriot-Watt University or approved tutors of Heriot-\watt University

PROGRAM BENEFITS

- Intensive classroom based workshop providing you with all the materials and expertise required.
- Provides the opportunity to interact with Heriot-Watt Professors and other industry experts.
- Collaborate and share ideas with contemporaries from a diverse, global background.

HOW DOES IT WORK?

NExT hosts the 5-Day workshops. The range of courses is listed below. These courses can provide you with a valuable addition to your own professional development. At the end of each of the workshops you will receive a Certificate of Achievement. These courses are stand alone in nature and would benefit anyone new to the industry or those looking to develop new skills in the industry.

WHAT COURSES ARE AVAILABLE?

- Reservoir Engineering
- Petroleum Geoscience
- Drilling Engineering
- Formation Evaluation
- Reservoir Simulation
- Petroleum Economics
- Production Technology
- Well Testing Analysis

FEES

The fee per short course is 4,200 US$.

FOR INQUIRIES

If you want to undertake a programme of study leading to an academic award, such as a Degree or Diploma then you may wish to enol in the MSc Distance Learning Programme in Petroleum Engineering from Heriot-Watt University. The details of this programme can be found at;

http://www.hw.ac.uk/postgraduate/petroleum-engineering.htm?shortTitle=msc-petroleum-engineering

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

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.

For a comprehensive portfolio of courses covering a broad spectrum of disciplines, visit **NExTtraining.net**

NExT
A Schlumberger Company