The Course Progression Matrix below shows how the Geology courses in this section are structured within each topic, from Basic to Specialized. On either side of the Geology section, you will see courses in associated disciplines for cross-training. These matrices are ideal for building training plans for early-career staff or finding the right course to build upon existing knowledge and experience.

As demonstrated by the FIELD TRIP icon next to our course titles, many of our courses include field trips. These courses bring material from the classroom into the field and allow participants to get an up-close view of geological concepts.

The following instructors have been selected and approved by the PetroSkills Curriculum Network:

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<tr>
<th>Instructors</th>
<th>Geophysics</th>
<th>Geology</th>
<th>Petrophysics</th>
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<td>Advanced Seismic Stratigraphy</td>
<td>Structural Interpretation</td>
<td>Naturally Fractured Reservoirs</td>
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<td>Dr. Michael Grammer</td>
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<td>Dr. John Piaget</td>
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<tr>
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<tr>
<td>Mr. Andrew Harper</td>
<td>Geological and Geophysical Characterization of Heavy Oil Reservoirs</td>
<td>Foundations of Petrophysics (Page 10)</td>
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<td>Mr. Andrew Harper</td>
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<td>Mr. Jeff Lelek</td>
<td>Basic Petroleum Technology Principles (Page 12)</td>
<td>Computer-Based Subsurface Mapping (Page 2)</td>
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Basic Petroleum Geology – BG

What is Basic Petroleum Geology? For all practical purposes it closely resembles the freshman level course that a non-science major at a university would take to satisfy the science requirement. Presentation is oriented toward topics of interest to the petroleum industry. While high school chemistry and physics might help in understanding a very few selected topics, the course is designed for those with no technical training (and those who studiously avoided science in school). Primary objectives of the course are to broaden your geological vocabulary, explain selected geological principles and processes, and describe how certain petroleum reservoirs and source rocks are formed.

**DESIGNED FOR**

Petroleum industry personnel in need of basic geological training, including engineering, geophysical, technical support, and administrative personnel.

**YOU WILL LEARN**

- About plate tectonics and petroleum
- About geological time and history
- The fundamentals of rock formation and deformation
- The essentials of various depositional environments and the reservoirs created by them
- The distribution of porosity and permeability in reservoirs produced in different depositional environments
- How rock characteristics are related to modern geological processes and applied to the ancient record
- About petroleum reservoir and source rocks
- How to correlate electric logs and recognize depositional environments on logs
- How to make contour maps and cross sections
- Elements of geophysics and exploration
- How geology bears directly on engineering practices

**COURSE CONTENT**

- Minerals and rocks • Plate tectonics
- Geological time • Weathering and erosion
- Deposition • Diagenesis • Reservoirs
- Structural geology and petroleum • Origin, migration, and trapping of petroleum

**YOU WILL LEARN**

- About plate tectonics and petroleum
- About geological time and history
- The fundamentals of rock formation and deformation
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- How to make contour maps and cross sections
- Elements of geophysics and exploration
- How geology bears directly on engineering practices
LONDON, UK 2-6 DEC $5035+VAT

**COURSE CONTENT**

- Creating isochore/attribute maps from well data
- Creating maps from seismic data
- Creating structure maps from well data
- Introduction • Gridding algorithms overview

**YOU WILL LEARN HOW TO**

- Generate detailed gross rock volume grids
- Generate Combined Risk Element Maps
- Use grid operations to manipulate existing maps
- Create structure, thickness, and attribute maps using interpretation or input data set. Participants will also utilize subsurface maps with subsurface datasets
- Understood the impact of different algorithms on output maps
- Understand the importance of different parameters for different data types and geologic scenarios
- Generate structure, thickness, and attribute grids using different techniques
- Quality control and edit grids and contours
- Use grid operations to manipulate existing grids and create new grids through simple and complex operations
- Generate Combined Risk Element Maps
- Generate detailed gross rock volume grids

**DESIGNED FOR**

Geoscience professionals and support staff who generate structure, isochore, and other subsurface maps using interpretation or mapping software.

**2019 Schedule and Tuition (USD)**

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<tr>
<td>Dubai, UAE</td>
<td>17-21 Nov</td>
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<tr>
<td>London, UK</td>
<td>4-8 Mar</td>
<td>$5035+VAT</td>
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</table>

* plus computer charge
Geology: Tools for Effective Exploration and Development – MGT

FOUNDATION 5-Day

Undiscovered reserves in prolific, mature basins and bypassed petroleum in developed fields are key targets for increasing reserves at minimal cost. Geochemical tools can dramatically improve discovery and development success by identifying and characterizing these targets in both conventional and unconventional systems. Participants learn to interpret geochemical logs, map organic facies variations, identify petroleum systems using multivariate data, predict vertical and lateral variations in oil quality and gas-to-oil ratios, and how to integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progress. The class gives special attention to three key applications of oil fingerprinting to unconventional reservoirs: (1) Characterization of frac height, (2) Quantification of the contribution of multiple formations to commingled production contacted by the induced fractures and (3) Identification of “cross talk” between wells completed in adjacent formations. The course also explains how to optimize development by predicting vertical and lateral variations in API gravity and viscosity.

DESIGNED FOR

Exploration and development geologists, geophysicists, geochemists, petroleum engineers, managers, and technical personnel. No background in geochemistry is needed.

YOU WILL LEARN HOW TO

• Characterize exploration risk in conventional and unconventional petroleum systems
• Integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression to optimize field development
• Assess frac height in unconventional reservoirs, and identify “cross talk” between frac networks in adjacent wells
• Quantify the abundance of frac water vs. formation water in the produced fluids from recently drilled unconventional wells
• Use geochemical tools, including TOC, Rock-Eval pyrolysis, vitrinite reflectance, geochemical logs, gas chromatography, stable isotope ratios, biomarkers, mud gas isotopes, and mud gas compositions
• Determine if hydrocarbon ‘stray gases’ found in an aquifer are, or are not, related to petroleum drilling activities in a given area
• Design geochemical studies and collect samples
• Recognize pitfalls in geochemical interpretations

Geological and Geophysical Characterization of Heavy Oil Reservoirs – HORC

BASIC 3-Day

As both heavy oil and bitumen are a global resource, they are fast becoming an asset base for many energy companies. Economic development of heavy oil reservoir requires accurate characterization of the rocks as well as the fluids contained therein. As heavy oil properties are different from conventional oil, its exploration and production requires special seismic strategies and rock physics models. Geophysical characterization of heavy oil reservoirs is therefore at the heart of production of this resource.

COURSE CONTENT

Mechanisms for the formation of heavy oil • General phase behavior of hydrocarbons and heavy oil • Properties of heavy oil and rock physics analysis • Geophysical approaches to characterization of heavy oil reservoirs • Measuring and monitoring heavy oil reservoir properties • Methods of extraction of heavy oil (HCIP, SAGD, etc.) • Challenges for heavy oil production • Seismic monitoring of high and cold heavy oil production • Optimization of Canadian heavy oil production through reservoir characterization • Environmental issues • Jeepary exercises on each of these units

2019 Schedule and Tuition (USD)

HOUSTON, US 18-22 NOV $4415

2019 Schedule and Tuition (USD)

CALGARY, CAN 27-29 MAY $3145+GST

Geomechanics for Heavy Oil – HOGM

FOUNDATION 3-Day

This course introduces an integrated workflow for reservoir containment evaluation and caprock integrity assessment in thermal operations such as SAGD and CSS in heavy oil reservoirs. The essential fundamentals of petroleum-related rock mechanics will be presented, and the processes of data collection, geomechanical characterization, and building Mechanical Earth Models (MEMs) will be discussed in details with an emphasis on data uncertainty. The course provides a comprehensive picture of the geomechanical behavior of heavy oil fields in response to thermal operations and shows how different modeling approaches may be implemented to predict this behavior and its associated geomechanical risks. It presents the application of modeling in mitigating the adverse effects of these risks and determining safe-operating criteria such as maximum operating pressure. Different aspects of field monitoring and real-time updating are discussed.

COURSE CONTENT

Reservoir containment evaluation • Caprock integrity assessment • SAGD and CSS in heavy oil reservoirs • Fundamentals of petroleum-related rock mechanics • Processes of data collection • Geomechanical characterization • Mechanical Earth Models (MEMs)

2018-19 Schedule and Tuition (USD)

CALGARY, CANADA 1-3 OCT 2018 $3130+GST

2019 Schedule and Tuition (USD)

HOUSTON, US 14-16 NOV $4415

Petroleum Systems Analysis – PSA

FOUNDATION 5-Day

This course addresses the fundamentals of the Petroleum System, and a holistic view of how it works, which is essential for geoscientists and engineers involved in today’s changing conventional and unconventional exploration and development projects. The elements of the Petroleum System, Charge, Trap, and Reservoir, are described systematically within the framework of play and prospect evaluation. The charge element begins with the deposition of the source rock and the establishment of its volumetric potential, or feedstock, for the system. Charge access involves converting this potential to expelled volumes, making, and then moving, the volumes from source bed to trap/reservoir, in the case of some unconventional reservoirs, this is within or adjacent to the source bed itself. A trap receives charge and petroleum columns build along its edges, until the container limit of the critical weak point is reached, or it spills. Reservoir rock storage and deliverability are modified by mechanical and chemical compaction, and fluid properties, fundamentally affecting project economics. Fluid properties further impact economics via the product value itself. This 5-day class uses new purpose-designed materials, and draws on a global database and familiarity with many different styles of producing basins, play, and accumulation.

COURSE CONTENT

Geologists, geophysicists, and petrophysicists working on basin, play or reservoir evaluation, and reservoir engineers seeking a bottom up understanding of the genesis of their reservoir, or field. The course provides a refresher in new concepts in this field for geoscientists at a fundamental level.

2019 Schedule and Tuition (USD)

HOUSTON, US 19-21 NOV $4325

Production Geology for Other Disciplines – PGD

FOUNDATION 5-Day

Have you ever wondered why it seems like Geologists rarely give you a straight answer? Are there never-ending qualifiers tacked to the answers they provide? “Usually, for the most part, chances are, often, almost all the time, maybe, could be, should be, can be, it depends…” What do you do with the ranges of the interpretations offered? This course will clear these questions... you will understand what makes the production geosciences tick; you will be able to phrase the appropriate questions, and then you will be able to deal with the answers. This course assumes the participant has some understanding of elementary geology, but it will provide a review of key geological principles and environments of deposition, all keyed to focus on the practical impact of geological models and uncertainty on appraisal and development. Without a common understanding between geologists and engineers, there can be no real communication or teamwork in reservoir development and production activities.

DESIGNED FOR

Production/completion/reservoir engineers, financial staff, professional staff from disciplines other than geology, and managers involved with reservoir management, and development/ production, who might require an understanding of geological data, its variability, and the effects of the data, and its interpretation, on their projects and jobs. This course is also appropriate for geologists early in their career development that are slated for production or development positions.

YOU WILL LEARN HOW TO

• Understand the sources of geological data and the interpretation of that data, including maps, cross-sections, electronic logs, and seismic sections
• Recognize the relationships between paleo-environmental interpretations and the practical application of these interpretations to field development
• Recognize and appreciate uncertainty in geological and geophysical data/interpretation
• Understand the uncertainty surrounding the geologist’s interpretation
• Recognize ways in which geological data is presented for evaluation in integrated asset teams
• Understand and more realistically evaluate geological data and interpretation
• Understand geological interpretation impact on production and development... pro and con

COURSE CONTENT

Correlation and stratigraphy • Structural interpretation • Seismology • Clastic/Carbonate deposition including an introduction to Unconventional Reservoirs • Reservoir geology Reservoir characterization and modeling • Volumetrics • Well planning • Reservoir appraisal • Field development • Uncertainty analysis

2019 Schedule and Tuition (USD)

HOUSTON, US 10-14 JUN $4325
**Sequence Stratigraphy: An Applied Workshop – SQS**

**FOUNDATION** 5-Day FIELD TRIP

Sequence stratigraphy, based on sedimentary response to changes in relative sea level gives the explorationist and the development geoscientist a powerful new predictive tool for regional basin analysis, shelf to basin correlation, and reservoir heterogeneity. Perhaps most importantly, sequence stratigraphy gives the geoscientist a superior framework for the integration of geologic, geophysical, and engineering data and expertise. The particular strength of this seminar is the application of these basic principles to actual subsurface data sets gathered into a series of well-founded exercises. In recent courses the data sets included Miocene delta complexes in Venezuela, Cretaceous incised valleys in the US, Paleozoic mixed clastic basin floor fans and low stand prograding complexes in the US, and Jurassic basin floor and slope fans in France.

**DESIGNED FOR**

Geologists, geophysicists, biostratigraphers, and engineers (with some knowledge of geology) needing a fundamental understanding of the principles and applications of sequence stratigraphy.

YOU WILL LEARN HOW TO

- Identify unconformities and sequence boundaries
- Identify paraconformities and utilize in correlation
- Identify incised valleys
- Visualize and interpret deep water fans and their geometry
- Recognize seismic signatures of deep water deposits
- Relate sequence stratigraphy to basin architecture and relative sea levels
- Build predictive stratigraphic models
- Utilize sequence stratigraphy to develop exploration/production strategies

**COURSE CONTENT**

Seismic geometries • Unconformities • Relative sea level • Eustasy • Parasequences and their stacking patterns • Parasequences as a correlation tool • Relationship of stratigraphic patterns to changes in subsidence rates as driven by regional and earth scale tectonic processes • Cycle hierarchy • World-wide cycle chart and its application • The sequence stratigraphic model • LST sequence boundaries, incised valleys, slope fans, basin floor fans, and prograding complexes • TST incised valley fill, source rock and reservoir seal • HST alluvial, deltaic, shoreline complexes and shelf sands • Sequence stratigraphy in a mixed clastic/carbonate province • Exploration and production scaled case histories and strategies

2019 Schedule and Tuition (USD)

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<td>SINGAPORE</td>
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* includes field trip

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**Structural Styles in Petroleum Exploration – ST**

**FOUNDATION** 5-Day INTERMEDIATE 5-Day Analysis of Structural Traps in Extensional Settings – ESS

Even with the best of data, the correct interpretation of a subsurface structure usually requires recognition of the fundamental characteristics of the assemblage in which it occurs and the range of trap styles to be expected. This course provides an overview of all hydrocarbon-bearing structural assemblages and their associated trap types. The processes that produce the structures and control their styles are interpreted in terms of basic rock mechanical principles. Classic outcrop, physical models, 2D and 3D seismic, and mature-field log-based interpretations from around the world provide analog examples for practical interpretation. Participants will work with the major structural trap geometries and the structural concepts for predicting the geometry where data are absent, misleading, or conflicting. The principles of section balancing and restoration are covered as tools for validating interpretations and for documenting structural evolution. Practical interpretation skills are developed in numerous exercises, most of which use seismic data.

**DESIGNED FOR** Exploration geologists, geophysicists, engineers, and geoscientific managers.

YOU WILL LEARN HOW TO

- Recognize all the different hydrocarbon-bearing structural styles in map and cross-section
- Distinguish the characteristics of each structural style on seismic reflection profiles
- Recognize the arrangement of structural styles and traps within structural families
- Apply mechanical-stratigraphic concepts to understanding and predict trap geometry
- Use restoration and balance to validate an interpretation and show the structural evolution

**COURSE CONTENT**

Comparative structural geology • Structural families and styles • Mechanical principles governing fault and fold geometry • Predicting structure from stratigraphy • Folding vs. faulting • Paleoplain restoration of cross-sections • Structural validation criteria • Sequential restoration and growth history • Regional arches and domes • Compaction and subsurface solution • Wrench faults: simple, convergent, and divergent • Conjugate and domino-style strike-slip regimes • Thin-skinned fold-thrust belts • Fault-related folds • Diapirs • Basement-involved contraction • Vertical and rotational block uplifts • Inversion: dip-slip to strike-slip • Thin-skinned extension • Basement-involved extension • Half-graben and full graben rift systems • Tectonic synthesis and exploration project

2019 Schedule and Tuition (USD)

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<td>LAS VEGAS, US</td>
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* includes field trip

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**Analysis of Structural Traps in Extensional Settings – ESS**

Extensional structures provide some of the world’s largest known oil reservoirs and remain one of the major frontier plays of the immediate future, both onshore and, particularly, in deep water offshore. 3D seismic has revolutionized structural mapping. However, the most realistic geologic interpretation of these structures is only as good as our ability to recognize and exploit the fundamental characteristics of the forms that are possible. This course presents outcrop, subsurface, seismic sections, and model analogs that will provide the starting point for structural interpretation in a wide range of extensional environments. Interpretations are validated by restoration and comparison to balanced models. This course covers the latest predictive kinematic models appropriate for rifted and other extensional and transtensional areas. The instructors of this course are happy to accept examples from your company for analysis in the class as one of the demonstration exercises. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time.

**DESIGNED FOR** Exploration and development geologists, geophysicists, engineers, and managers responsible for the interpretation and drilling of extensional structures.

YOU WILL LEARN HOW TO

- Distinguish the characteristics of extensional and transtensional structural styles and traps within structural families
- Apply mechanical-stratigraphic principles to understanding and predict trap geometry
- Use restoration and balance to validate an interpretation and show the structural evolution
- Predict structural geometry from sparse or inconsistent data using kinematic models
- Recognize typical extensional and transtensional petroleum-trapping geometries

**COURSE CONTENT**

Extensional structural styles and their plate tectonic habitats • Models for lifting and passive continental margin evolution • Transformative structures • Detached and basement-involved styles • Map patterns • Half grabbers and full grabbers • Faultblock uplift • Pre-inversion normal faults • Ramp-flat and listric-fault related structures • Related block with stopwatch graben style • Structural validation criteria • Selecting the best balancing and restoration technique • Flexural-slip restoration and predication • Vertical and oblique simple shear • Rigid-block restoration • Area-depth technique for section validation, depth to detachment, bed-length changes and fault prediction • Effect of detachment-zone thickness • Transition from horizontal to vertical displacement • Extensional drape folds • Tectonic models of drape folds • Sequential restoration of growth structures • Fracturing in extensional structures

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* includes field trip

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**Basin Analysis Workshop: An Integrated Approach – BA**

Intermediate basin analysis, whether for conventional or unconventional resource play analysis, demands an integrated approach from explorationists. It is both inappropriate and misleading to suggest that the tectonic-thermal-sedimentologic evolution of any one basin is an established fact, or even that all basins submit to the same simple and equivocal models. Therefore, this five-day course does not passively present an inventory of basins of the world. Instead, this workshop provides the theory, methods, and active practice for participants to develop and optimize their own individual basin evaluation and modeling modus operandi. Incorporated as practical problems for workshop analysis and substantial team discussion are case histories and new findings from throughout the world utilizing geologic, geophysical, and geochemical data sets. In addition, students construct and interpret their own 2D and 2D basin models using BASINMD, an industry standard of basin modeling software.

**DESIGNED FOR** Geoscientists, especially those in New Ventures or in Asset Evaluation, who require a non-superficial but practical application of an integrated variety of state-of-the-art geological/geochemical/geophysical tools for the regional to local evaluation of conventional and unconventional resource plays in sedimentary basins.

YOU WILL LEARN HOW TO

- Systematically assess the evolution of a basin’s conventional and unconventional petroleum system criticals through space and time through a practical application of geology, geophysics, and geochemistry
- Evaluate the geomechanical fundamentals controlling a basin’s burial history through tectonic subsidence analysis
- Relate organic source quantity and quality to sedimentary processes and environments
- Delineate migration pathways through space and time
- Evaluate seal/trap quality
- Geoverticalize the kinetic model
- Rank and quantify the petroleum system risk both deterministically and stochastically using Monte Carlo methods
- Determine within a basin the optimal stratigraphic and spatial locations for exploring conventional and unconventional resources
- Work in an integrative team to generate and present a prospect from the team’s own crafted 2D basin model from both well control and seismic generated virtual wells
- and more

**COURSE CONTENT**

Geomechanical fundamentals • Geothermal criticals • Geochronological • Migration criticals • Reservoir criticals • Seal and trap criticals • Timing criticals • Risk and decision-making

2019 Schedule and Tuition (USD)

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* plus computer charge

All classes available at your location. Contact us today. +1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Deep-water Turbidite Depositional Systems and Reservoirs – DWT

INTERMEDIATE 5-Day

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of literature of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow deposition and process including many case studies of reservoir architecture and sand-body quality and distribution with an introduction to new concepts, ideas, and methods in turbidite reservoir geology. Participants will be introduced to the limitations of conventional models for turbidite reservoirs and taught how to build enhanced predictive models using a combination of subsurface, outcrop, and modern sea-floor data. Through practical exercises and discussions, participants will experience the relative importance of a broad range of subsurface data. 3D seismic data from a range of locations will illustrate the quality and level of reservoir resolution possible when using modern techniques. Modern sea-floor data from several turbidite basins will be available and participants will receive instruction on interpretation. Criteria for identification and interpretation of injected sandstones will be discussed. Special note: sessions in Nice and Kilkee will include field trips. The seven-day sessions will combine field and classroom based sessions. There will be four days in the classroom with lecture material and oilfield exercises on exploration and production, and three days in the field examining spectacular deepwater systems of either the Arnot Sandstone Formation in Nice, Ross Sandstone Formation in Kilkee, or the Pont Lobos Submarine Canyon and Pigeon Point Formation in Monterey, California. For Nice session, a moderate degree of physical fitness is required. For Kilkee, the going is easier in the field.

DEIGNED FOR
Geologists, geophysicists, engineers, and petroleum analysts; petroleum engineers; and experienced technicians.

YOU WILL LEARN HOW TO
• Interpret turbidite depositional environments using data from cores, cuttings, and wireline logs.
• Prepare facies maps.
• Apply modern stratigraphic concepts to turbidite reservoirs.
• Predict reservoir size, shape, trend, and quality.

COURSE CONTENT

Development Geology – DG

INTERMEDIATE 5-Day

Successful field appraisal, development, and management requires a fundamental understanding of the reservoir pore space distribution. Participants learn, through hands-on exercises, to develop a development plan that emphasizes optimal recovery. Emphasis is placed on rock, log and test data to distinguish reservoir and non-reservoir rock properties. Structural, stratigraphic, deposition and reservoir concepts are used to locate drill sites and describe reservoirs. The input required to construct a geologic reservoir model is reviewed. Participants learn the importance of modifying development plans as a field becomes more mature. Techniques for mature field rejuvenation are discussed through case histories.

DEIGNED FOR
Reservoir, development, and exploration geologists; geophysicists; petrophysicists; log analysts; petroleum engineers; and experienced technicians.

YOU WILL LEARN HOW TO
• Select optimum drill sites for field development.
• Use log and rock data to identify reservoir rock, non-reservoir rock, and pay.
• Determine fluid distribution in a field and identify reservoir compartments.
• Estimate field reserves through the life of a field.
• Characterize carbonate and clastic rocks by productivity.
• Construct geologic reservoir models.
• Determine field drive mechanism.
• Apply seismic analysis to reservoir development.
• Determine depositional characteristics to optimize development.
• Compile a development plan.
• Use economic techniques to evaluate different development plans.

COURSE CONTENT

Geochemical Techniques for Solving Reservoir Management and Field Development Problems – GTS

INTERMEDIATE 5-Day

In field development and production, numerous problems can be solved through integration of geochemical, geological, and engineering data. Geochemical approaches for solving these problems are appealing for several reasons. 1) They provide an independent line of evidence that can help resolve ambiguous geological or engineering data. Example: geochemical data can reveal whether small differences in reservoir property reflect the presence of a barrier between the sampling points. 2) They are far less expensive than engineering alternatives. Example: geochemical allocation of commingled production costs only 1-5% as much as production logging. 3) They have applicability where other approaches do not. Example: geochemical allocation of commingled production can be performed on highly-deviated or horizontal wells and on wells with electrical submersible pumps - well types not amenable to production logging. This course explains how geochemistry complements other reservoir management tools. Case studies and exercises illustrate key points. Computer-based exercises illustrate the use of certain key software packages. Sampling pitfalls and sources of contamination are discussed. The course will NOT cover PVT (Pressure-Volume-Temperature) relationships or equation of state calculation.

DEIGNED FOR
Development geologists, petroleum engineers, managers, and technical personnel.

YOU WILL LEARN HOW TO
• Use mud gas isotopes to identify and characterize pay zones.
• Use the geochemistry of produced fluids (oil, gas, water) and/or core material to identify missed pay, assess reservoir compartmentalization, allocate commingled production, identify completion problems (tubing leaks, poor cement jobs, etc.), characterize induced fractures (e.g., fracture height), monitor the progression of floods (water, gas, or steam), predict vertical and lateral variations in fluid viscosity and gravity, and identify the geological processes which control fluid properties in a given field.
• Use certain key software packages (including, PaakView, ReserView, OLIuminer, Exess Pressure calculations, etc.).

COURSE CONTENT
Using fluid compositions as natural tracers for tracking fluid movement and compartmentalization. Understanding processes that cause compositional differences between fluids (e.g., differences in source faces, source maturity, biodegradation, water washing, evaporative fractionation, etc.). Integrating geochemical, geological, and engineering data to identify missed pay, characterize reservoir compartmentalization, allocate commingled production, identify well completion problems, predict fluid viscosity/ gravity, and monitor floods. Basics of oil, water, gas, and mud gas compositional analyses.
Integrated Carbonate Reservoir Characterization – ICR

INTERMEDIATE 5-Day

This course will review the controls on carbonate reservoir heterogeneity from the pore architecture scale to the geometrical attributes at reservoir-scale and how these parameters can be incorporated and integrated into the development of viable petrophysically-based reservoir models for carbonates. In-class exercises are used to reinforce the potential integration of various data sets to provide students with experience in carbonate reservoir characterization.

DESIGNED FOR
Exploration and development geoscientists, petrophysicists, reservoir engineers, geostatistical modelers and research/development staff.

YOU WILL LEARN HOW TO
• Integrate various aspects of carbonate rocks for improved carbonate reservoir architecture and flow unit characterization
• Apply knowledge of petrophysical, sedimentological petrologic tools to characterize and evaluate carbonate reservoirs
• Recognize and understand well log responses in carbonate systems and to learn to utilize data from formation evaluation tools to determine reservoir quality
• Identify potential stratigraphic variations in carbonate pore architecture and its effect on permeability
• Better understand the relationship of primary depositional facies, sequence stratigraphic framework, and diagenetic history to pore architecture and reservoir quality
• Better understand fracturing in carbonates, relating fracturing density, aperture, length to facies, lithology, and diagenesis
• Distinguish controls on carbonate reservoir heterogeneity, sub-reservoir to reservoir scale
• Better understand carbonate reservoir heterogeneity and the value of 3D geological model building to better manage the development of carbonate reservoirs

COURSE CONTENT
Importance of understanding the various scales of heterogeneity in carbonate reservoirs • Carbonate deposition, diagenesis, mineralogy, rock textures, and pore types • Carbonate rock and carbonate pore system classification • Carbonate rock properties and core analysis • Well log response, limitations, and strengths in carbonates • Determination of lithology, porosity, and permeability • Fracture identification and distribution • Porosity/depth relationships in limestone and dolomite reservoirs • Importance of sequence boundaries to development of pore architecture • Variations in carbonate pore architecture and its effect on permeability • Relationship of primary depositional facies, sequence stratigraphic framework and diagenetic history to pore architecture and reservoir quality • Controls on reservoir heterogeneity, from sub-reservoir to reservoir scale • Value of analogs for development of petrophysically-based reservoir models • Value and limitations of 3D geostatistical models to understand reservoir heterogeneity and architecture

Operations Geology – OG

INTERMEDIATE 5-Day

At the end of this integrated course, participants will be able to contribute effectively to the preparation of planned wells and their concurrent operations during the exploration, appraisal, and development phases. As geoscientists, petroleum engineers, well engineers, and production technologists are increasingly assembled in asset, project, or operational teams they must not only understand each other in technical matters, but should also contribute to each other’s efforts in these aspects: a driller should know why it is important to cut a core or log a particular interval despite potential drilling problems, and geoscientists should understand drilling operations and their inherent hazards and problems. All should be able to understand and prepare daily drilling reports with a full appreciation of the various subjects. Cuttings, core, logs, and well tests should be analyzed, cross-correlated, and compiled to mesh with prognoses and existing data to effectively manage the impact on the field development plan. Correct procedures in tendering and contracting should be followed to minimize the duration of the operations and to maximize the quality of the operations services provided. Understanding of all operations should greatly improve the effectiveness of the Operations Geologist’s role: A basic knowledge of geology and/or petroleum geology is advisable if not required to fully appreciate the course contents.

DESIGNED FOR
All geoscientists, petroleum engineers, well engineers, and technical personnel, who in the course of their career will attend or direct subsurface and wellsite operations.

YOU WILL LEARN HOW TO
• Plan and prepare for a drilling location and for geological services
• Identify drilling operations and geological drilling problems
• Understand and apply logging services
• Understand well testing services
• Evaluate drilling reports
• Describe drilling cuttings and cores
• Evaluate the impact on the field development plan
• Prepare and compile operations reports

COURSE CONTENT
Petroleum geology and its systems • Operations geology: prospect to well planning, provision of geological services • Wellsite geology: geological sampling, sample analysis, and well stratigraphy, cutting, and core description • Structural geology: fractures, faults, borehole geology • Drilling Operations: bits, fluids, casing and cement, drilling problems and well control, directional drilling, geosteering • Logging operations: acquisition, tools, quick look interpretation, MWD/LWD, geosteering • Well testing and fluids: reservoir properties, rock and fluid interaction, permeability, averaging, data gathering and interpretation • Impact on FDP: case histories • Tending and contracting • Reporting: geological data, petrophysical data, pressure data • Exercises: core, cuttings, quick look, pressures, daily drilling report

Prospect and Play Assessment – PPA

INTERMEDIATE 5-Day

This fully revised and updated course is a fully modern approach to defining prospect and play volumetrics, uncertainties in defining these volumes and the risk that the accumulation fields. This course offers the fraction-by-fraction, probabilistic play and prospect assessment procedures that are consistent and repeatable allowing for direct comparisons play to play or prospect to prospect. In addition, the methods offer measures of the play prospectiveness based on the number and resource size distribution of potential future fields. Tools include comprehensive assessment forms for prospects and plays, and graphs, data tables, and guidelines for making all assessment decisions.

DESIGNED FOR
All exploration team members and leaders including geologists, geophysicists, geochemists, analysts, reservoir engineers, economists, planners and managers who make business decisions based upon exploration data.

YOU WILL LEARN HOW TO
• Calculate geological risk and uncertainty in exploration prospects
• Determine prospect resource volume estimates
• Assess resource distribution in a play
• Understand the differences between stochastic and probabilistic estimates and have the knowledge to know when to use one or the other
• Predict the number and size distribution of potential future fields in a play
• Describe and calibrate risks associated with discovering a successful play

COURSE CONTENT
Geological controls of oil and gas occurrence • Review of common assessment methods • Application of volumetric prospect assessments: techniques, comparative data, and graphs to estimate input factors, such as trap volume, porosity, net/gross saturation, hydrocarbon fill fraction, formation volume factors, and recovery efficiencies • Probability methods • Risk analysis • Hydrocarbon charge assessment: procedures for estimating possible amounts of oil and gas generated, migrated, and trapped in prospects • Prospect assessment workshop: Play assessment techniques: estimating the possible numbers, sizes, and associated risks for potential fields, with useful data on field densities, field-size distributions, oil versus gas relationships, and dependent versus independent risks • Play recognition and mapping: play classification and subdivision, and play maps that high-grade the most favorable areas with minimal geologic risks • Play assessment workshop: projects supplied either by the instructor or by participants, worked by teams and reported to the entire group • Aggregation of assessment results: summing, derisking, and preparation for economic analysis • Limitations, pitfalls, uses, and discovery concepts: the philosophy of judging and using assessment results and the importance of basic geologic aspects

Naturally Fractured Reservoirs: Geologic and Engineering Analysis – FR

SPECIALIZED 5-Day

This course covers geologic and engineering concepts, methodology, and technology used to characterize, evaluate, and manage naturally-fractured reservoirs. Applications and limitations of geologic and engineering procedures and tools are discussed. Field examples and case studies demonstrate the importance of integrated geologic and engineering studies in developing effective, economical reservoir management strategies for different types of reservoirs.

DESIGNED FOR
Engineers and geoscientists interested in a multi-disciplinary approach to evaluating and predicting the overall effect of natural fractures on subsurface fluid-flow and subsequent reservoir performance.

YOU WILL LEARN HOW TO
• Detect and predict subsurface natural fracture occurrence and intensity from cores and well logs
• Determine fractured rock properties affecting reservoir performance
• Design and analyze pressure transient tests in naturally-fractured reservoirs
• Evaluate reservoir performance in naturally-fractured reservoirs
• Develop and apply numerical simulation models to fluid-flow in naturally-fractured reservoirs
• Apply coupled geomechanics/flow behavior to reservoir management strategies in naturally fractured reservoirs
• Evaluate the impact of natural fractures on hydraulic fracture stimulation

COURSE CONTENT
Characterization of natural fractures and fracture systems • Influence of mechanical stratigraphy and structure on fracture development • Detection and prediction of subsurface natural-fracture occurrence and intensity from cores and well logs • Fractured rock properties affecting reservoir performance • Classification of naturally-fractured reservoirs with reservoir examples and potential production problems • Naturally-fractured reservoirs: fluid-flow, well performance and well testing, reservoir performance, numerical simulation • Geomechanics/flow behavior • Behavior and stimulation of naturally-fractured reservoirs • Effects of natural fractures on reservoir permeability, anisotropy, drainage area, and waterflow sweep efficiency

2019 Schedule and Tuition (USD)

2019 Schedule and Tuition (USD)

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Kuala Lumpur, MYS

2019 Schedule and Tuition (USD)

Houston, US

Kuala Lumpur, MYS

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Basic Geophysics – BGP

BASIC 5-Day

This course is designed to familiarize anyone using seismic data with the nature of the data and what they specifically represent. One of the key goals of the course is to explain the large and confusing amount of jargon that is used by the geophysical community when they use seismic data. The course is supplemented by a large number of case histories that concretely illustrate the principles in the course material. These are updated with every course presentation to keep up with the rapidly developing technology in this field. Each section of the course is supported with a classroom exercise. The course participants are given a thumb drive that contains the case histories, class exercises, and all of the extensive PowerPoint animations used in the classroom.

DESIGNED FOR
Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in using seismic data that needs to understand and use this data at a basic level or to communicate with others that use it.

YOU WILL LEARN
- How seismic data represent subsurface rock parameters including the relative structure, lithology, and pore filling material
- How land and marine seismic data are acquired and processed to produce both two- and three-dimensional seismic images
- The limits of vertical and horizontal resolution inherent in the seismic data
- How seismic data are used to measure reservoir parameters and how data guide reservoir development; this includes a detailed discussion of AVO and other seismic attributes
- The various approaches to seismic imaging and how the velocity model relates to this image
- How new technologies including seismic inversion have helped us define rock properties including pore pressure, water saturation, and fracture orientation
- How to value developments such as time lapse seismic surveys for reservoir monitoring purposes

COURSE CONTENT
- The nature of seismic data
- What is wave propagation
- What causes seismic reflections and how they relate to rock properties including pore filling material
- The wavelet in the seismic data and its limit of resolution
- Seismic velocities as they relate to rock properties and the imaging process
- The relationship between seismic velocities and pore pressure
- Pore pressure prediction
- Seismic data processing and seismic migration
- Prestack, poststack, time and depth imaging
- Direct hydrocarbon indicators and AVO
- Seismic inversion for rock and fluid properties
- Seismic attributes
- Time lapse reservoir monitoring (4D seismic surveys)
- Recent developments in seismic acquisition, processing, and interpretation

BGP is also available as a self-paced, virtual course which is an enhanced version of the face-to-face public session.

23 APR - 19 JUN  $3900
18 JUN - 14 AUG  $3900
10 SEP - 6 NOV  $3900
PETROSKILLS.COM/BLENDED-BGP

Basic Petroleum Technology Principles – BPTP

BASIC 20 HOURS

PetroSkills PetroAcademy

BLENDED LEARNING

This course will be delivered virtually through PetroAcademy providing participants with the knowledge they need at their convenience.

This course provides the participant with an understanding of basic petroleum technology in the context of the Petroleum Value Chain, from exploration to abandonment. The participant will understand how and when geoscience and engineering professionals use technology to determine and optimize the economic value of an oil and gas field. This enables the participant to maximize their professional and administrative contribution in their organization.

DESIGNED FOR
Those who need to achieve a context and understanding of E&P technologies, and the role of technical departments in oil and gas operations. An understanding and use of oilfield terminology is developed.

YOU WILL LEARN
- Historical petroleum occurrences and usage
- The objectives and processes of the exploration phase of the E&P asset life cycle
- The objectives, processes, and economic metrics of the appraisal phase of the E&P asset life cycle
- Basic reserves and production value concepts
- The Earth’s structure, continental drift, and plate tectonics role in oil and gas exploration
- Rock types and classification in an oil and gas context
- The relationship between depositional environments and geological settings
- Exploration concepts
- Elements of a successful petroleum system
- Key differences between unconventional and conventional petroleum systems
- Features of structural contour and isopach maps
- The basic reservoir rock properties and the significance of core samples
- The roles involved in exploration
- Rig type classification and selection for onshore and offshore drilling
- and more...

COURSE CONTENT
E&P industry and asset life cycle • Petroleum geology • Hydrocarbon reservoirs • Rock and fluid properties • Surface/subsurface exploration • Drilling operations and well completions • Production operations

FOR MORE INFORMATION, VISIT: PETROSKILLS.COM/BPTONLINE

Self-paced, virtual course - start anytime.

2019 Schedule and Tuition (USD)

HOUSTON, US 11-15 MAR $4225
6-12 JULY $4225
7-11 OCT $4225
KUALA LUMPUR, MYS 18-22 NOV $5120
LOMPOC, US 3-7 JUNE $4355+VAT
4-8 NOV $4355+VAT
NEW ORLEANS, US 6-10 MAY $4170

Basic Petroleum Technology – BPT

BASIC 5-DAY

This course provides the participant with an understanding of basic petroleum technology in the context of the Petroleum Value Chain and Asset Management, from exploration to abandonment. Unconventional shale (tight oil and gas) and conventional oil and gas are covered. The participant will understand how and when geoscience and engineering professionals use technology to determine and optimize the economic value of an oil and gas field. This enables the participant to maximize their professional and administrative contribution in their organization. Participants first learn and understand why various global oil and gas production types and plays (unconventional and conventional) have different value. The participant learns which technologies are used by the geoscience and engineering departments during each stage of the asset life cycle and WHY! This E&P lifecycle context accelerates an understanding of basic petroleum technologies and the oil industry. This learning is achieved through guided discussions, videos, animations, and progressive team exercises utilizing ‘Our Reservoir’ and ‘Our Well’ as working models.

DESIGNED FOR
This course is appropriate for those who need to achieve a context and understanding of E&P technologies in conventional and unconventional fields, and/or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

YOU WILL LEARN
- The E&P Process and how it differs in conventional vs unconventional plays, the role of each technical department and specialist, and the technologies used
- The economic value and properties of reservoir fluids
- Petroleum geology for exploration and production
- About oil and gas reservoirs, both conventional and unconventional, and understand the key differences
- Exploration and appraisal technologies
- Drilling operations for exploration, development and production
- Production - well completions and production technology
- Reservoir recovery mechanisms through primary, secondary, and tertiary recovery
- Surface processing of produced fluids

COURSE CONTENT
World hydrocarbon production and consumption review including reserves, benchmarks, and the impact of shale resources • Reservoir fluid properties • Petroleum geology • The petroleum reservoir, conventional and unconventional • Exploration technologies for conventional and unconventional reservoirs including initial reserve estimates and consequent field development • Drilling and operations • Well completions and workers • Production operations • Reservoir recovery mechanisms • Surface processing

2019 Schedule and Tuition (USD)

HOUSTON, US 11-15 MAR $4225
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7-11 OCT $4225
KUALA LUMPUR, MYS 18-22 NOV $5120
LOMPOC, US 3-7 JUNE $4355+VAT
4-8 NOV $4355+VAT
NEW ORLEANS, US 6-10 MAY $4170
Seismic Interpretation  - SI1

FOUNDERD  5-Day

Can I observe the reservoir on seismic? How large is the reservoir? Did the well cut a fault? Can seismic help me tie a set of wells? What kind of a structural trap did I drill into? Is the structure broad or a small structure? Are these reflections real or multiples? How can I combine structural and stratigraphic interpretations to develop a structural and depositional history?

How does seismic data acquisition and processing impact my interpretation? Will my well encounter hazards such as abnormally high or low pressure or shallow gas? The student learns to answer these and related questions by gaining an understanding of the seismic system, its limitations and pitfalls, and by interpreting 2D and 3D seismic examples of structural and stratigraphic features associated with actively producing hydrocarbon areas.

DESIGN FOR

Geologists, geophysicists, and engineers who want to use seismic data for petroleum exploration and/or production. Familiarity with geological terminology will be helpful.

YOU WILL LEARN HOW TO

• Understand the seismic process, interpret seismic sections, develop a geologic model, and create maps.
• Relate the subsurface stratigraphy to well data.
• Identify different structural styles from seismic.
• Create a basic stratigraphic framework using seismic stratigraphy.

COURSE CONTENT

• Basics: geological controls on the propagation, reflection, and refraction of seismic waves
• Data acquisition and processing with emphasis on its potential impact on interpretation
• 2D and 3D interpretation techniques
• Seismic interpretation of different structural styles: extensional, compressional, strike-slip, inverted, salt, and gravity dominated basins
• Seismic velocities
• Sequence stratigraphy and seismic facies analysis
• Acoustic impedance
• DH’s
• AVO

AVO, Inversion, and Attributes: Principles and Applications  - AVO

INTERMEDIATE  5-Day

The subject of direct hydrocarbon indicators and AVO has rapidly expanded to include AVO inversion, offset AVO inversion, and 4D AVO inversion. A significant part of the course deals with rock physics as it relates to the other topics in the course. Further insight into the seismic data is supplied by looking at seismic attributes. The technology has provided the interpreter with a very new and exciting package of tools that allow the user to look at the seismic image as being truly representative of both the rock properties and the pore filling material. This course is intended to provide the users with a clear and useable understanding of the current state of these technologies. The focus of the course is on both understanding and application. Exercises: Each topic in the course outline is reinforced by an exercise that gives the participants many practical and simple methods in integrating the course material into their everyday work.

DESIGN FOR

Geophysicists, geologists, explorationists, seismic interpreters, technical support personnel, seismic data processors, exploration, production, and acquisition managers who need a clear understanding of the details of interpretation and application of this technology.

YOU WILL LEARN HOW TO

• Clearly understand how hydrocarbon affect the seismic image
• Use direct hydrocarbon indicators and AVO in the assessment of projects
• Understand the limits of seismic resolution
• Integrate these technologies into an interpretation project
• Better understand the nature of the seismic image as it relates to hydrocarbons
• Utilize the information available in the literature from experts in this rapidly developing part of seismic imaging

COURSE CONTENT

• Seismic fundamentals as they relate to defining the seismic image
• An inventory of direct hydrocarbon indicators, including AVO
• Risk rating prospects that display AVO anomalies
• Understanding rock properties and the effect of pore filling material
• AVO and how it relates to the typical production zones around the world with various ages and depths of burial
• Various methods of displaying AVO effects in the seismic data
• Acquisition and processing considerations to display hydrocarbons as a pore filling material
• Various approaches to seismic modeling and fluid replacement
• Rock properties and pore filling material from seismic inversion
• Spectral decomposition and seismic attributes as other ways of extracting reservoir information from the seismic image
• Methods of combining attributes as they relate to prospectivity

Introduction to Seismic Stratigraphy: A Basin Scale Regional Exploration Workshop  - ISS

INTERMEDIATE  5-Day

One of the most revolutionary, most effective, yet most under-utilized tools introduced into exploration this century is that of seismic stratigraphy. It is not a tool exclusive to geophysicists, nor is it a tool only for geologists. Seismic stratigraphic techniques are based upon an integration of the well, established geological and geophysical fundamentals. When properly applied, seismic stratigraphy provides a powerful foundation for geohistory analysis helping describe a basin’s evolution and the resulting effects upon its spatial and temporal variation in hydrocarbon potential. Seismic stratigraphy chronostratigraphically constrains both the exploration for its petroleum and fault mechanical stratigraphy of a basin. Furthermore, it can provide a predictive model extrapolated beyond the borehole to aspects of the quality of potential reservoirs and seals, their sedimentary environments of deposition, and in some cases, even their paragenesis. In this rigorous workshop, participants practically apply the seismic stratigraphic method to optimizing their exploration efforts by working in teams on projects selected from diverse settings around the world. Areas for the projects include borehole-constrained seismic data drawn from such regions as the Alaska North Slope, Gulf of Mexico, Red Sea, Southeast Asia, South America, and Western Africa.

DESIGN FOR

Geophysicists, geologists, explorationists, and managers who are interested in an introduction or review of the theory and application of contemporary seismic stratigraphic techniques to exploration.

YOU WILL LEARN HOW TO

• Apply geophysical fundamentals to uncovering the geological information embedded within seismic
• Understand the premises behind the Vail seismic sequence paradigm
• Construct and interpret chronostratigraphic charts, sea level curves, and seismic facies maps
• Interpret classic and carbonate depositional system responses to both allocyclic and autocyclic processes and the effects upon reservoir architecture and seal potential
• Systematically reconstruct a basin’s geohistory which provides the critical foundation for its petroleum and fault mechanical stratigraphy

COURSE CONTENT

• Introduction to Seismic Stratigraphy
• Geophysical fundamentals
• Breaking out operational sequences
• Introduction to fault interpretation
• Chronostratigraphy construction and interpretation
• Sea level curves, accommodation space, and cycle orders
• Vail sequence theory and sequence hierarchy
• Carbonate sequences
• Siliciclastic sequences
• Seismic facies
• Paleo-environmental analysis
• Geohistory reconstruction
• Optimizing exploration

2019 Schedule and Tuition (USD)

2019 Schedule and Tuition (USD)

2019 Schedule and Tuition (USD)

2019 Schedule and Tuition (USD)
Advanced Seismic Stratigraphy: A Sequence – Wavelet Analysis Exploration – Exploitation Workshop – ADS

Seismic stratigraphy is a powerful tool for exploration and exploitation. The methods used in this workshop do not rely upon either cosmetic processing or interpretation as an art; instead, practical methods of seismic stratigraphy are employed as a science, based upon firm, tested principles that are applied to a spectrum of tectonic structural styles and depositional environments. Participants learn how to make seismic modeling-interpreting judgments as a basis for seismic-facies and reflection character analysis. Case studies for exploration and development incorporate 2D and 3D seismic data with well data selected from around the world. Each participant should bring a hand-held calculator to class.

YOU WILL LEARN HOW TO
• Evaluate rock-fluid information from wavelet analysis (frequency, velocity, G. seismic attributes, and AVG)
• Understand the strengths and weaknesses of geowaluation using and misusing sonetics, seismic inversion, and VSP
• Determine fault mechanical stratigraphy through proper interpretation of fault imaging
• Understand the differences, weaknesses, and strengths of both the Vail with the Galloway sequence paradigms and when to optimally employ them
• Develop sea level curves from micropaleontology
• Construct detailed seismic facies maps and understand their relationship to Walter’s law
• Classify deltas based upon their seismic characteristics
• Differentiate basin floor fan facies and parasequence sets
• Interpret clastic and carbonate depositional system responses to alluvial, estuarine, and eolian processes and the effects upon reservoir architecture and seal potential
• Optimally interpret parasequence set fairways for exploration
• Geologically characterize reservoirs for optimizing development

COURSE CONTENT
Review of philosophy and epistemology • Application of geophysical fundamentals (wave theory, attributes, frequency substitution, and coherence) • Amplitude variation with offset (tholithologies, fluids, gases, porosities, and pressures) • Fault mechanical stratigraphy • Vail and Galloway sequence theory and application • High resolution sea level curve generation from micropaleo • Shallow and deep water siliciclastic sequences • Seismic facies and paleo-environmental analysis • Reservoir scale geophysics using the wavelet • Imaging hydrocarbons • Geohistory reconstruction • Optimizing exploration and development

Coring and Core Analysis – CCA

FOUNDATIONS 5-Day LAB VISIT
More than three-quarters of current additions to the world’s reserves come from better management of existing reserves. Core-based measurements offer the most tangible and direct means of determining critical reservoir parameters. Core analysis can play a vital role in field equity or utilization and is often considered to be the ground truth to which other measurements are compared (e.g., wireline logging). Using a multidisciplinary approach, participants are taken through the steps necessary to obtain reliable core analysis data and solve formation evaluation problems. Throughout the course, the participants are given hands-on problems and practical laboratory and field exercises, which reinforce the instruction. “Laboratory visit with core analysis measurement demos (where feasible).

DESIGNED FOR
Geophysicists, geologists, and explorators who have completed the PetroSkills course, Introduction to Seismic Stratigraphy: An Exploration Workshop: A Basin Scale Regional Workshop, or have comparable training and desire a challenging workshop, which will improve exploration and development skills.

YOU WILL LEARN HOW TO
• Design coring programs and maximize core recovery
• Preserve core to minimize rock alteration
• Take and analyze sidewall cores
• Use cores to estimate porosity, permeability, and fluid saturation (Basic core analysis)
• Understand special core analysis (e.g., wettability, relative permeability, capillary pressure, and reservoir fluid distribution for reservoir engineering and petrophysical evaluation)
• Prevents errors in core analysis vendor reports (quality control)
• Select samples for special core studies
• Correlate core and log data

CORE CONTENT
Coring and core analysis objectives • Coring hardware and maximizing core recovery • Core-handling, wellsite procedures, and preservation methods • Sidewall coring and analysis • Organizing effective laboratory programs • Porosity, permeability, and fluid saturation • Unconventional Reservoir Analytical Protocol • Quality control in core analysis • Petrography and mineralogy • Special core analysis sample selection and statistical data analysis • Core-log correlation (includes near well calibration, acoustics, nuclear, and electrical properties) an introduction to rock mechanics • Wettability, relative permeability, capillary pressure, and reservoir fluid distribution • Data integration in reservoir simulation • Final problem: design of coring and core analysis program

Well Log Interpretation – WLI

FOUNDATION 5-Day
The most universal, comprehensive, and concise descriptive documents on oil and gas wells are logs. They impact the work of almost every oilfield group from geologists to土豪s to bankers. Familiarity with the purposes and optimum applications of well logs is, therefore, essential for people forging their careers in the oil business. The instructor uses a novel approach to help participants develop a good grounding in understanding and applying well logging techniques. General principles of physics are presented to explain the functioning of modern logging tools. Wherever possible, the physics of logging measurements is related to everyday tools and applications. Participants develop an appreciation for the constraints and limitations of operating in the borehole environment. A number of actual log examples are related to basic principles in the description of reservoir properties such as porosity, mineralogy, formation factor, saturation, and hydrocarbon type for essentially clean reservoirs. Cross-plotting and reconnaisance techniques quickly and efficiently discriminate between water, oil, and gas. Error minimization techniques, applicable only to computerized log analysis, produce optimal results. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

DESIGNED FOR
Petrophysicists, geologists, geophysicists, engineers, technicians, or anyone interested in a solid understanding of the principles of borehole geophysics.

YOU WILL LEARN HOW TO
• Identify reservoirs
• Determine mineralogy, porosity, and saturation in various lithologies
• Recognize the importance of electrical properties of earth materials
• Highlight oil mobility
• Interpreting pressures
• Develop optimum tools and logging programs
• Apply quick-look methods of formation evaluation

CORE CONTENT
Logging objectives • Invasion profile • Challenge of borehole geophysics • Passive electrical properties of earth materials • Resistivity measuring tools, normal, induction, laterolog • Reservoir/non-reservoir discrimination • Multi-sensitivity logs, GR, SGR, Po • Depth measurements and control • Borehole calipers • Porosity-mineralogy logs, density, neutron, sonic • Porosity determination in clean formations • Formation resistivity factor • Conductivity of shales • Porosity log crosstabs and mineralogy identification • Partially saturated rock properties and Archie Equation • and more...

2019 Schedule and Tuition (USD)

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Petrophysics is fundamental to all aspects of the petroleum business. Principles, applications, and integration of petrophysical information for reservoir description will be discussed in depth. Through a combination of class discussion and exercises/workshops, participants will learn how to conduct competent quicklook evaluations. Using data from open hole logs, logging-while-drilling, and core data you will evaluate porosity, permeability, and saturation in a variety of reservoirs. Knowing how to integrate petrophysical information with other data sources will improve participants’ ability to assess technical risk when examining hydrocarbon opportunities.

DESIGNED FOR
Geoscientists and engineers with less than twelve months’ experience using petrophysical data and other technical staff at all experience levels wanting a fundamental background in the petrophysics discipline.

YOU WILL LEARN HOW TO
• Understand and apply a basic level of theory and operation of major petrophysical tools
• Calibrate porosity and permeability values from core and log sources for improved saturation calculations
• Apply basic open hole logging, borehole seismic, image, and LWD/MWD
• Analyze and integrate log, core, geoscience, and engineering well data for well and field development projects
• Select petrophysical tool combinations for specific applications
• Assess the impact of petrophysical analyses on technical uncertainty estimates of reservoirs

COURSE CONTENT
Fundamental concepts of petrophysics • Depositional systems and petrophysical rock parameters • Nature of porosity and permeability • Basic rock properties; theory and quicklook techniques • Mudlogging • Core analysis, acquisition, interpretation, and quality checks • Theory and basics of resistivity, radioactivity, acoustic tools • LWD/MWD versus open hole logging • Determination of rock types using core and logs • Petrophysical impact on economic uncertainty • Evolving petrophysical technologies • Overview of cased hole logging
**Petrophysics of Unconventional Reservoirs – PUR**

**INTERMEDIATE 3-Day**

Petrophysics is central to the integration of a wide spectrum of related geoscience and engineering disciplines. However, students should also be familiar with at least two or more of the following topics: horizontal well drilling, wireline logging and log analysis, coring and core analysis, petrophysics, geophysics, geochemistry, formation testing, rock mechanics, hydraulic fracturing, and petroleum economics.

**DESIGNED FOR**

Geoscientists involved with the evaluation and exploitation of unconventional reservoirs including tight gas sands, shale gas, and coalbed methane.

**YOU WILL LEARN HOW TO**

- Interpret petrophysical data gathering from unconventional reservoirs from both core and log data
- Assess TOC and maturity indicators
- Evaluate measurement provided by service companies
- Gauge gas-in-place and reserves in unconventional reservoirs
- Recognize consequences and magnitudes of shale anisotropy
- Interpret NMR and capillary pressure measurements made on shale
- Interpret microstructural imaging of shale

**COURSE CONTENT**

Overview of unconventional reservoirs • Geochemistry of unconventional rocks • Special coring and core analysis techniques for unconventional • Wireline logging of unconventional reservoirs • Assessment of formation organic content (TOC) and maturity • Gas-in-place and reserve and flow potential estimates • Geomechanics and fracturing

---

**Structural and Stratigraphic Interpretation of Dipmeters and Borehole-Imaging Logs – SSI**

**INTERMEDIATE 5-Day**

Dipmeters are micro-resistivity logs that detect the orientations of bed boundaries and borehole elongations. Borehole-imaging logs provide video, density, gamma-ray, acoustic, and/or electrical images of the borehole face. Dipmeters and borehole images can be run in water-based or oil-based mud on wireline or LWD. They are used structurally to detect, orient, and quantify natural and induced fractures, faults, fold axes, unconformities, and in situ stress. Stratigraphically, dipmeters and borehole images are used to identify paleopore orientations, bounding surfaces, facies, thin beds, net-sand, and secondary porosity. The key objective of dipmeter and borehole-image interpretation is to describe structural and stratigraphic features encountered by a wellbore, commonly in the absence of core. This course provides numerous hands-on exercises and case studies that emphasize sedimentology, stratigraphic, and structural applications of these widely run, but generally underutilized logging tools.

**DESIGNED FOR**

Petrophysicists, geologists, geophysicists, and team members involved in reservoir characterization.

**YOU WILL LEARN HOW TO**

- Interpret dipmeters and borehole-imaging logs and understand the physical principles behind them
- Detect and quantify faults and fractures, determine in situ stress orientations, improve horizontal well placement, provide input into flow simulations
- Determine paleopore orientations, define stratigraphic compartments, quantify vuggy porosity, detect thin beds, analyze depositional characteristics, interpret image facies
- Apply image data in reservoir characterization

**COURSE CONTENT**

Applications and types of dipmeters and borehole images • Data acquisition and processing • Quality control and artifacts • Generation and use of stereonets and rose diagrams • Quantitative analysis using cumulative dip plots, vector plots, and SCAT plots • In situ stress from borehole breakout and drilling induced fractures • Horizontal wells • Identification and classification of fractures, faults, sub-seismic scale faults, micro-faults, and unconformities • Fracture spacing and wellbore bias correction • Thin bed analysis and net-sand counts • Carbonate porosity and facies interpretation • Sedimentology from borehole images: burrows, cross beds, scourred surfaces, slumps • Determination of paleopore directions • Interpretation of borehole images in various depositional settings • Application of image data in geocellular modeling and reservoir characterization

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**Integration of Rocks, Log and Test Data – ILC**

**INTERMEDIATE 5-Day**

This course provides the background necessary to address the more complex reservoir evaluation and productivity challenges within exploration, field appraisal, and field development. The key fundamentals of rock properties, logging tools, and engineering data required to solve these problems are reviewed. The concepts are illustrated with a series of real world examples that become increasingly complex as knowledge is gained in the class. Emphasis is placed on solving problems in a workshop format.

**DESIGNED FOR**

Petrophysicists, petroleum reservoir engineers, geologists, and geophysicists who have a basic understanding of petrophysics, geology, and engineering and need a more advanced understanding of how to integrate the different data sets together to more completely understand reservoir performance. It is recommended that participants have a basic knowledge of logging fundamentals. The basics of logging will be reviewed in the class.

**YOU WILL LEARN HOW TO**

- Identify clastic and carbonate rock types based on petrophysical differences
- Determine the key reservoir rock parameters needed for a more accurate reservoir evaluation
- Use cuttings, sidewall cores, and cores to determine reservoir parameters
- Design an integrated interpretation
- Calculate Vclay
- Calculate porosity using porosity logs in complex lithologies
- Determine what percentage of porosity contributes to production
- Calculate Sw using different methods
- Determine pay and pay classes
- Tie rock and well log information to production performance

**COURSE CONTENT**

Objectives of integration • Key rock properties for formation evaluation • Impact of depositional environment and rock properties • Petrophysical rock type • Texture, porosity, and permeability • Clay impact • Summary of basic logging tools • Subsurface rock sampling • Use of subsurface pressure data and evaluation • Relative permeability • Capillary pressure application to pay determination • Basic methodology for an integrated interpretation • Rock typing • Catalog approach • Clastic and carbonate rock types • Important reservoir rock parameters • Cementation and saturation components CEC fluid sensitivity • Review of production profiles • Overview of pressure transient analysis • Calculation of Vclay/Vshale calibration of core and logs • Calculation of porosity using porosity logs in complex lithologies • What is effective porosity • Calculation of SW using different methods • Determining pay and pay classes

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**Wireline Formation Testing and Interpretation – WFT**

**SPECIALIZED 5-Day**

Formation testing and sampling tools (FTs) with wireline and while-drilling are widely used in exploration/appraisal and reservoir development projects. Over the past two decades, modern tools, such as MDT, RCI, RDT, and FRP, have emerged to become one of the critical formation evaluation means in drilling projects with high cost/risk and high reward environments. In recent years, FT tools while-drilling provide alternatives of formation testing at earlier timing, flexible operational sequences in complicated wellbores access to reservoirs. FT pressure data and fluid samples are acquired for predicting hydrocarbon resource sizes and assessing key development uncertainties. This course is designed to satisfy the interdisciplinary needs of geoscientists, petrophysicists, and reservoir engineers with an increasing use of FT data. Practical and hands-on exercises are worked in the class.

**DESIGNED FOR**

Geoscientists, petrophysicists, wellsite supervisors, reservoir engineers, and geodata technologists of multidisciplinary formation evaluation and development teams engaging in explorations, appraisals, and field development activities.

**YOU WILL LEARN HOW TO**

- Apply formation testing and sampling technologies, applications, and limitations
- Understand how FTs work; configure tool strings and design a test program
- Perform QA/QC pressures and sampling data in real-time
- Interpret pressure gradient data for fluid densities and contact levels
- Understand reservoir connectivity/continuity and compartmentalization
- Quantify uncertainties of data interpretation results
- Interpret graphical techniques (scatterplot, excess pressures, normalization)
- Design and interpret Mini-DST and VDT data

**COURSE CONTENT**

Why formation testing and sampling • How FT tools work; measurement principles; test types; drawdown mobility; data quality QA/QC • Pressure fluid gradient and contact level interpretation principles • Graphical pressure interpretation techniques; scatter-plot for gradient, FWL, and compositional gradient; excess pressure plot for compartmentalization; normalization plot for depleted reservoirs • Multiple well pressure trends for reservoir compartmentalization, continuity, and extent • Qualification and quantification of interpretation uncertainties • Mud filtration phenomena dynamics; dynamic gradient; supercharging; wettability/capillary effects • Optical property measurement of reservoir fluids and contamination control; sampling principles and fluid sample QA/QC procedures; in-situ fluid PVT analysis • Permeability test; mini-DST and VIT; practical aspects of well productivity and deliverability potential estimates

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**2019 Schedule and Tuition (USD)**

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<td>LONDON, UK</td>
<td>5-9 Aug</td>
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*Includes field trips*
Basic Reservoir Engineering – BR

5-Day

This course is designed to help the participants develop a more complete understanding of the characteristics of oil and gas reservoirs, from field and rock characteristics through reservoir definition, development, classification, and production. The data collection, integration, and application directed toward maximizing recovery and Net Present Value are stressed. Basic reservoir engineering equations are introduced with emphasis directed to parameter significance and an understanding of the results.

**DESIGNED FOR**
- Geologists, geophysicists, engineers, engineering trainees, technical managers, technical assistants, technicians, chemists, physicists, technical supervisors, service company personnel, engineering representatives, data processing personnel, and support staff working with reservoir engineers and wanting to understand the process of reservoir definition, development, and production, or engineers newly placed in a reservoir engineering position that want a first reservoir engineering course at the Basic level.

**YOU WILL LEARN**
- How to collect and analyze the data needed for reservoir engineering tasks
- Fundamentals of fluid flow in porous media
- How reservoirs are characterized by fluid type and drive mechanisms
- The basis for reservoir fluid distribution
- About oil and gas production and pressure buildup analysis
- About oil displacement and optimizing reservoir performance
- The basics of enhanced oil recovery
- How oil and gas in place can be estimated and recovery predicted

**COURSE CONTENT**
Reservoir fluid properties • Coring practices and reservoir rock properties • Fundamentals of fluid flow • Reservoir fluid distribution • Reservoir classification • Reservoir drive mechanisms • Oil and gas well performance, including inflow and outflow concepts • Pressure buildup analysis • Oil displacement concepts • Estimation of oil-in-place and gas-in-place • Recovery techniques

Basic Drilling Technology – BDT

5-Day

This course addresses the technology used to drill wells from a fundamental viewpoint. Equipment and procedures involved with drilling oil and gas wells are described for those who are interested regardless of academic background. The overall drilling process is presented along with definitions and descriptions of drilling equipment. This provides the vocabulary to understand the drilling process. The various components and procedures are discussed in great detail with explanations of the basic science concepts which guide these processes. Subjects include descriptions of drill bits, directional drilling, drilling fluids, solids control, cementing, well bore stability, well control, measurement-while-drilling techniques, stuck pipe, lost circulation, and well bore hydraulics. Some technology enhancements are included to improve understanding of drilling operations for all participants, with or without a scientific background. A discussion of clay mineralogy helps understand well bore instability and drilling fluids. A discussion of pressure and pressure effects helps explain many of the procedures and problems associated with drilling wells. Rocks behave differently under pressure and understanding this behavior helps in understanding drilling performance. Some discussions of drilling include mathematical explanations for those involved with the engineering aspects of drilling operations; however, the concepts and intent of these mathematical equations will be explained in simple terms. After all various components and procedures are discussed, the information contained in morning reports is explained and used as a summary of the course content.

**DESIGNED FOR**
- Petroleum and production engineers, completion engineers, geoscientists, managers, technical supervisors, service and support personnel, entry level drilling engineers, drilling operations personnel, drilling office support staff.

**YOU WILL LEARN**
- About drilling equipment and how it is used
- Drilling terminology and abbreviations
- Keys to planning a successful well
- Common drilling problems and avoiding them
- How to read a morning report
- Technology behind info in a morning report

**COURSE CONTENT**
- Drilling process and equipment • The language of drillers - understanding their terminology
- Understanding the abbreviations and acronyms associated with drilling • Rig equipment and types • Types of drill bits • Mud • Mud control • Drilled solids management • Mud tank arrangements • Drilling fluid properties • Well control • Cementing • Casing design • Hole problems (pack off, lost circulation) • Well control • Directional drilling operations and tools • Safety

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BR is also available as a virtual course which is an enhanced version of the face-to-face public session.

PTO is also available as a virtual course which is an enhanced version of the face-to-face public session.
CROSS-TRAINING

Integrated Reservoir Modeling – GRD

INTERMEDIATE 5-Day
As the oil companies define business units and asset teams, it is becoming increasingly important that all the team members understand the workflow in developing integrated reservoir description for that asset. A proper development of reservoir description is helpful in managing daily operations of the asset, as well as long-term planning. Integration involves using all the available information about the reservoir to develop better understanding of the reservoir. This process is inherently interdisciplinary and requires understanding of all the disciplines. Although soft skills are important in working in an interdisciplinary team, this course concentrates on the hard skills required to develop a realistic reservoir description. Starting with collecting information and assessing the need for additional data, the course will cover all the topics from structural and geological modeling, estimation of reservoir petrophysical properties using geostatistical tools, upsampling to simulator model and finally, proper history matching and future predictions in the presence of uncertainties. This course is important to reservoir modellers involved in any phase of the description work. This is intended to expose various geoscientists and engineers to the entire process of integrated reservoir description and the geostatistical tools that can be used to achieve the goals. The course will develop improved appreciation of the other disciplines’ needs as well as the necessity of the feedback during the integration process. The instructor of this course is willing to accept examples from your company for analysis in the class as one of the demonstration exercises.

DESIGNED FOR
Geologists, geophysicists, engineers, petrophysicists or others involved in reservoir modeling.

YOU WILL LEARN HOW TO
• Develop the workflow in the reservoir integration process
• Evaluate and quantify uncertainties in various sources of data
• Build a geo-cellular model using geostatistical tools and upscale it to capture essential heterogeneities
• Develop criterion for objective history matching
• Utilize seismic data in different phases of reservoir description and integrate them using geostatistics
• Use various description tools in a judicious manner
• Use public domain software to apply many of the techniques discussed in class

COURSE CONTENT
Basic statistical principles • Spatial modeling • Structural modeling • Estimation of reservoir properties at well locations • Conditional simulation • Facies/rock type modeling • Petrophysical properties simulation • Ranking of realizations • Construction of simulator input model • History matching • Future predictions and quantification of uncertainty

Reservoir Characterization: A Multi-Disciplinary Team Approach – RC

INTERMEDIATE 5-Day
The modern team approach to Reservoir Characterization describes productive zones more reliably through the integration of disciplines, technology, and data. Increase your proven reserves, discover by-passed pay, reduce development time and costs, improve production rates, and rejuvenate old fields through the skills learned in this course.

The course is process-based and focuses upon understanding the applicability of measurements and interpretations from the participant’s discipline to other adjacent disciplines, understanding information from other disciplines, and the uncertainties and risks involved in its gathering/interpretation, awareness of the latest technologies and working principles evolving on the cutting edge of the industry, managing a complex project to solve business problems in the most efficient manner, particularly when working in a difficult environment (multi-disciplinary teams, sponsors and bosses outside your expertise, cross purposes from disciplines), and working with both probabilistic and deterministic multiple working hypotheses throughout a hydrocarbon project.

During the course, particular attention will be paid to uncertainties and risks. It will be shown how these can be handled and their impact on the economics of hydrocarbon projects. The instructor is willing to accept examples from your company for analysis in the class as one of the demonstration exercises. It is also possible to design a course specifically for your own company around such a case study. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time.

DESIGNED FOR
Geologists, geophysicists, reservoir engineers, production engineers, petrophysicists, exploration and production managers, team leaders, and research scientists.

YOU WILL LEARN HOW TO
• To develop a business proposal for any Reservoir Characterization project
• To apply the concept of correlation length to understand reservoir continuity
• To define hydraulic flow units in a reservoir
• To assess the economics of oil and gas projects across their entire life cycle
• To carry out the integrated Reservoir Characterization process

COURSE CONTENT
Business value drivers and selection criteria • The scale and resolution of data • Varigrams, correlation length • Time, rock, and flow units • Seismic attributes • Upscaling, streamline simulation, decision trees, value of information • Giving and receiving feedback • The future of Reservoir Characterization

Introduction to Data Management – IDM

BASIC 2-Day
This course provides an overview of data management in E&P, focusing on the subsurface domain. The need to deliver good data management is increasingly being seen as providing competitive advantage across the E&P industry, since wise business decisions depend on sound data and information. Participants will leave this course with an understanding of the core E&P data types, their use in the business, and data management issues and challenges facing companies. You will have the knowledge and tools necessary to participate in developing a structured data management framework, which will deal with these issues in a practical and effective manner to ensure business efficiency and value is realized. This course provides an understanding of essential E&P data management principles and concepts using an interactive classroom format; participants will have the opportunity to learn from presentations, exercises, and interactive discussions. Course instructors are experienced data management practitioners, who have delivered services and projects to many E&P companies, from small independent to super majors.

DESIGNED FOR
As this course is foundational it will be of most benefit to those with little or basic prior understanding of technical data used in the E&P industry. Course attendees may hold a variety of roles such as data or information managers, technical managers and assistants, technologists, geologists, geophysicists, etc.

YOU WILL LEARN
• What is data management, why it is important, understanding of data as an asset, its lifecycle, benefits of good data management, and its potential value
• The core data types in the E&P industry and valuable best practices for them
• Common data management issues and challenges, and the impact on the business
• The important components of a data management framework
• How to map issues onto a data management framework

COURSE CONTENT
Data types: definitions • Common data management issues: causes of data issues, data management best practices, business impact • Overview of data management: definition, data lifecycle, importance and value of data management, benefits of good data management, business case aspects and barriers • Data management framework: governance, architecture, security, reference and master data management, data quality management

Seismic Positioning Data Management – SPDM

FOUNDATION 2-Day
While both seismic navigation and trace data topics are covered, there is a greater focus on the geo-spatial component of trace data, with respect to navigation and positioning. The course will offer insight into geodetic considerations to ensure removal of geo-spatial data ambiguity using case studies of data acquisition, processing, data loading, and proposed well location selection. Preservation of metadata and compliance to international standards in data exchange provide the integrity backbone to enhancing data quality and removing any ambiguity with respect to geo-referencing and legal ownership. Ensuring interpreters interpret and are not deviated from their activities by having to resolve mis-ties within the data is key to enhancing efficiency at a critical stage of the project cycle.

DESIGNED FOR
This course is aimed at a wide audience and will be of particular benefit to technicians, data loaders, and data analysts. Those involved with seismic data processing can preserve data quality and obtain geo-spatially accurate imaging of subsurface features by applying techniques covered in the course. Asset team members responsible for maintaining seismic data and data loading to interpretation workstations can enhance their processes by applying techniques covered.

YOU WILL LEARN HOW TO
• Assess data quality and manage seismic trace and navigation data related to seismic data acquisition, processing and data loading
• Apply best practices to enhance and preserve data integrity and ensure seismic data sets are fit for purpose and do not contain geophysically significant errors
• Preserve metadata and maintain compliance with international standards for data exchange

COURSE CONTENT
Seismic navigation data principles • Basic geodey • 2D data kiding exercises • Data quality control and practical examples thereof • 2D data editing and exporting • 3D bin grid data definitions and exercises for importing, analyzing, editing, and exporting • Applied geodey Introduction to EFSIS database • Trace data Licensing • Acquisition • Storage • Import and quality assessment • Formats and conversions • Best practices

2019 Schedule and Tuition (USD)

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See website for dates and locations.

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**Applied Environmental Management Systems – AEM**

**FOUNDATION 5-Day NEW**

Since the Rio de Janeiro Earth Summit (UNCED) held in 1992, environmental issues have been drawn to the forefront of organizations’ operations and possibly their reputations. A review of the world’s press often reveals spillages, toxic releases, fires, and other pollution events. There are efficiency opportunities from better use of energy, water and from reducing waste in a systematic way. Participants will receive a template Environmental Management System (EMS) manual for their own use as part of the study materials. This class provides a complete review of the international standard for environmental management, ISO 14001:2015, as well as other environmental management techniques. Over five days, the class works through the PDCA improvement cycle provided by ISO 14001, teaching the tools and techniques of excellent practice. The course includes a week-long practical implementation case study set in the fictional highly-realistic setting of oil products distribution company Melvis Group where the new learning is validated through application. Please see [www.melvisgroup.com](http://www.melvisgroup.com) for more information.

**DESIGNED FOR**

Environmental professionals seeking a deeper knowledge of environmental management systems (EMS) and/or external certification to ISO 14001, H&S managers wanting to broaden their knowledge in a related discipline, project managers, other staff with delegated environmental responsibilities such as those related to energy, waste, or water.

**YOU WILL LEARN HOW TO**

- Successfully design and use the principle elements of an environmental management system in a typical petrochemical organisation
- Identify and integrate key tools associated with Occupational Health and Safety (OHS) management, including environmental impact assessment, setting and progressing environmental objectives, emergency preparedness, and incident investigation
- Reflect on, shape, and initiate improvements in the environmental (HSE) culture of an organization
- Communicate a powerful improvement message to a team of senior leaders

**COURSE CONTENT**

Content of the organization • Leadership and commitment • Environmental policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities (aspects, compliance, objectives) • Resources, competence, awareness, communication, documentation • Operational planning and control • Emergency preparedness and response • Monitoring, measurement, analysis, and evaluation • Internal audit • Management review • Improvement

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**Applied Occupational Health and Safety Management Systems – HSM**

**FOUNDATION 5-Day NEW**

Every 15 seconds, somewhere in the world, a worker is killed and over 150 others are injured. Our members’ and clients’ experience is that committed application of an Occupational Health and Safety Management System (OHSMS) can reduce such incidents, while providing a platform for sustained cultural change. We call this ‘predict and prevent’ instead of the unstructured approach of ‘react and remedy.’ Participants will receive a template OHS-MS manual for their own use as part of the study materials. This class provides a complete review of the new international standard for occupational health and safety management, ISO 45001:2018, as well as an overview of other common OHS-MS (HSG65, ILO OSH-2001, IOGP HSE-MS) that can be aligned to organizations’ own systems. Over five days, the class works through a Plan, Do, Check, Act improvement cycle teaching the tools and techniques of excellent practice. The course includes a week-long practical implementation case study set in the fictional highly-realistic setting of oil products distribution company Melvis Group where the new learning is validated through application. Please see [www.melvisgroup.com](http://www.melvisgroup.com) for more information.

**DESIGNED FOR**

Health and Safety (H&S) professionals who want to take advantage of the new improvement opportunities presented by ISO 45001 (or seek external certification), project managers, contract managers, members of H&S committees, directors of smaller organisations with limited access to specialist H&S advice.

**YOU WILL LEARN HOW TO**

- Successfully design and use the principle elements of an OHS-MS in a typical petrochemical organisation
- Identify and integrate key tools associated with OHS management, including HazID, risk assessment, JSA, PTW, LOTO, active and reactive monitoring
- Reflect on, shape and initiate improvements in the safety culture of an organization
- Communicate a powerful improvement message to a team of senior leaders

**COURSE CONTENT**

Context of the organization • Leadership and commitment • OHS policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities (objectives and planning to achieve them • Support (competence, awareness, communication, documentation) • Operational control • Emergency preparedness • Performance evaluation (monitoring, internal audit, management review) • Improvement

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### Basic Petroleum Economics – BEC3

**BASIC** 3-Day

Could you answer the following three questions for your next project? What will it cost? What is it worth? Will it earn sufficient profit? Before undertaking any project, these questions should be answered, and this course will provide the fundamentals necessary to enable you to do so. Contractual arrangements, which also significantly impact the economic viability of a project, are covered. Participants practice cash flow techniques for economic evaluations and investigate frequently encountered situations. Each participant will receive Economics of Worldwide Petroleum Production, written specifically for PetroSkills courses.

### Petroleum Risk and Decision Analysis – PRD

**FOUNDATION** 5-Day

Good technical and business decisions are based on competent analysis of project costs, benefits and risks. Participants learn the decision analysis process and foundation concepts so they can actively participate in multi-discipline evaluation teams. The focus is on designing and solving decision models. About half the problems relate to exploration. The methods apply to R&D, risk management, and all capital investment decisions. Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations. Decision tree and influence diagrams provide clear communications and the basis for valuing each alternative. The complimentary Monte Carlo simulation technique is experienced in detail in a hands-calculation exercise. Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. The mathematics is straightforward and mostly involves only common algebra. This is a fast-paced course and recommended for those with strong English listening skills. This course is intended as the prerequisite for the Advanced Decision Analysis with Portfolio and Project Modeling course.

### Petroleum Project Management: Principles and Practices – PPM

**INTERMEDIATE** 5-Day

Successful petroleum operations need a blend of technology, business savvy, and people skills. If you have a firm grasp of exploration or production technology, boost its impact by applying Project Management techniques. Running a staged program that integrates reservoir modelling, production estimating, drilling, and facility design is challenging. The tools and techniques covered in this course will help you meet that challenge. Upon completion you will know how to make better decisions in field development that lead to high value and low cost; develop integrated plans to run the overall program; and develop key deliverables for each stage of development to reduce uncertainty. Instruction, guided discussions and in-depth work tasks are used. You may choose a case study from several real-life situations that are based on the instructor’s petroleum experience. Or you may bring the details of one of your own current programs.

### Project Management in Upstream Field Development – FPM2

**FOUNDATION** 3-Day

A project does not stand alone. Not only does a project manager need to stay focused on project cost, schedule and performance targets, he or she must take a broader view. Many projects are a part of a larger field development program. Maintaining coherence among related projects is essential to success. This course will help you effectively deliver facility and infrastructure projects that are crucial for timely oil and gas production. Upon completion you will know how to use fit-for-purpose project management control tools for good project results: work the project management, drilling and completion, HSE, land, production, and transportation disciplines together for success; and control interfaces among different projects and contractors. This course addresses key requirements for repetitive projects in oil and gas programs. These projects include well flow lines, tank batteries, booster compressors, short pipelines, and meter stations that are a part of a larger field development program. Emphasis is on both conventional and unconventional resources, such as shale oil and coal bed methane. The course is taught using a blend of instruction, guided discussion, and hands-on exercises based on the instructor’s petroleum successes and failures. The exercises will include both individual and group activities.

### COURSE CONTENT

**Basic Petroleum Economics** - Describes the elements of the decision analysis process and the respective roles of management and the analysis team • Express and interpret judgments about risks and uncertainties as probability distributions and popular statistics • Represent discrete risk events in Venn diagrams, probability trees, and joint probability tables • Solve for expected values with decision trees, payoff tables, and Monte Carlo simulation (hand calculations) • Craft and solve decision models • Evaluate investment and design alternatives with decision tree analysis • Develop and solve decision trees for value of information (VII) problems • Craft and solve decision models. Value of information (a key problem type emphasized in the course), flexibility and control, project threat and opportunities • Monte Carlo Simulation: Latin hypercube sampling, portfolio problems, optimization, advantages and limitations • Decision Criteria and Policy: value measures, multiple objectives, HSE, capital constraint, risk aversion • Modeling the Decision: influence diagrams, sensitivity analysis, modeling correlations • Basic Probability and Statistics: four fundamental rules including Bayes’ rule (the easy way), calibration and eliciting judgments, choosing distribution types, common misconceptions about probability • Evaluating a multi-pay prospect (team exercise), and more

**Petroleum Risk and Decision Analysis** - Decision Tree Analysis: decision models, value of information (a key problem type emphasized in the course), flexibility and control, project threat and opportunities • Monte Carlo Simulation: Latin hypercube sampling, portfolio problems, optimization, advantages and limitations • Decision Criteria and Policy: value measures, multiple objectives, HSE, capital constraint, risk aversion • Modeling the Decision: influence diagrams, sensitivity analysis, modeling correlations • Basic Probability and Statistics: four fundamental rules including Bayes’ rule (the easy way), calibration and eliciting judgments, choosing distribution types, common misconceptions about probability • Evaluating a multi-pay prospect (team exercise), and more

### 2019 Schedule and Tuition (USD)

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**Essential Technical Writing Skills** – ETWS

**BASIC** 3-Day
Writing for work-related purposes ought to be brief, clear, informative and, above all, readable. In this practical hands-on course, you gain a solid foundation in technical writing skills. The primary theme for the course is that a writer must “think constantly about their readers.” Examples and exercises provide hands-on experience. You may choose to bring a sample of your writing for one-on-one feedback.

**DESIGNED FOR**
All engineers, managers, IT/computer support staff, team leaders, supervisors, and individuals responsible for writing letters, memos, reports, procedures, test results, and proposals that are clear, concise, and professional.

**YOU WILL LEARN HOW TO**
- To focus on the reader as the receiver of the information
- To develop quality writing that will:
  - Improve business relationships and communication
  - Enable you to write better and faster
- Make your writing more credible
- Enable you to write better and faster
- Make your writing more concise and specific
- Make your writing more professional

**COURSE CONTENT**
Develop essential technical writing skills to convey a convincing message
- Compose clear messages using a structured writing approach
- Adapt your writing style to your audience’s needs
- Edit at the word level to improve persuasiveness and impact
- Write precise and concise memos, letters, summaries, and reports
- How to best display visual information
- Create informative content using lists, bulleted, and short paragraphs as the primary writing mode

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**Team Building for Intact Teams** – TB

**FOUNDATION 2-Day**
This workshop is most effective when attended by an entire team. Team members will develop and refine the skills essential for high performance teams. Emphasis is placed on learning more effective ways to enhance total team functionality and maximum team productivity. Individual communication styles will be assessed and examined to identify the most appropriate uses of team strengths. This will be an active experience. In addition to receiving individual assessment information, participants will be exposed to team concepts, theories, and skill development through the use of a variety of learning techniques. This course has been constructed to maximize opportunity for intact teams to strengthen team performance and team productivity.

**DESIGNED FOR**
Any intact team interested in becoming a stronger and more productive team, such as project teams, leadership teams, cross-functional teams, production teams, quality improvement teams, etc.

**YOU WILL LEARN HOW TO**
- Characterize high performance teams
- Ensure that your team has clarity of goal and worthiness
- Jointly develop a team charter
- Gain commitment of all members
- Build team collaboration and trust
- Establish and follow group operational norms
- Work through the stages of team development
- Define team roles and relationships
- Understand system influences
- Promote conditions for effective team building
- Confront individual and team assessments
- Improve team communications
- Improve group dynamics
- Problem solve in teams
- Develop a team plan to improve team effectiveness
- Lead when necessary
- Monitor team progress

**COURSE CONTENT**
Purpose of teams • Characteristics of a high performance team • Gaining clarity of goal and worthiness • Developing a team charter • Gaining commitment • Team collaboration and trust • Establishing group operational norms • Working through the stages of team development • Effective team roles and relationships • Dealing with system influences • Conditions for effective team building • Individual and team assessments • Team communications • Group dynamics • Problem solving in teams • Developing personal plans to improve team effectiveness • Taking the lead • Effective team meetings • Monitoring team progress

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**Team Leadership** – TLS

**FOUNDATION 2-Day**
This program will develop and refine the skills essential for leading a high performance team. Emphasis is placed on the leader’s role in effectively enhancing total team functionality and maximum team productivity. Individual communication styles will be assessed and examined to identify the most appropriate communication style to use with your team. This will be an active experience. In addition to receiving individual assessment information, participants will be exposed to team concepts, theories, and skill development through the use of lectures, videos, readings, role plays, case studies, and discussions. This course has been constructed to maximize opportunity to improve both knowledge and practical skills in leading a team and being a team player. (This is a great course to attend immediately following PetroSkills’ course titled: Leading and Managing Others.) In addition to this program designed specifically for Team Leaders, PetroSkills has a 2-day course titled: Team Building for Intact teams.

**DESIGNED FOR**
Team leaders, supervisors, managers, and others responsible for leading a team and interested in establishing and/or being a part of a highly productive team.

**YOU WILL LEARN HOW TO**
- Characterize high performance teams
- Gain clarity of goal and worthiness
- Develop a team charter
- Gain commitment
- Build team collaboration and trust
- Establish operational norms
- Recognize stages of team development
- Confront individual and team assessments
- Understand system influences
- Promote conditions for effective team building
- Conduct individual and team assessments
- Improve team communications
- Improve group dynamics
- Develop personal plans to improve team effectiveness
- Foster team leadership
- Monitor team progress

**COURSE CONTENT**
Definition and purpose of teams • Characteristics of a high performance team • Gaining clarity of goal and worthiness • Developing a team charter • Gaining commitment • Team collaboration and trust • Establishing operational norms • Stages of team development • Team roles and relationships • System influences • Conditions for effective team building • Individual and team assessments • Team communications • Group dynamics • Developing a personal team leadership plan • Monitoring team progress • Developing a team leadership action plan

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