The Course Progression Matrix below shows how the Petrophysics courses in this section are structured within each topic, from Basic to Specialized. On either side of the Petrophysics 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.

**Foundations of Petrophysics - FPP** on page 1 and **Well Log Interpretation - WLI** on page 2 are essential as foundation Petrophysics courses. We are also happy to offer two newer courses, **Mudlogging – MDLG** on page 2 and **Nuclear Magnetic Resonance Petrophysics – NMRP** on page 3.

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

**Foundations of Petrophysics**
- **Basic**
  - Mr. David Patrick Murphy
  - Mr. Robert Portugal
  - Dr. E. C. Thomas
- **Intermediate**
  - Mr. Robert Portage
  - Dr. E. C. Thomas
- **Specialized**
  - Mr. Robert Portugal
  - Dr. E. C. Thomas
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 roostabouts to bankers. Familiarity with the purposes and optimum applications of well logs is 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. Whenever 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 reconnaissance techniques quickly and efficiently discriminate between water, oil, and gas. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

DESIGNED FOR
Petroleumists, 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
• Interpret pressure profiles
• Understand optimum tools and logging programs
• Apply quick-look methods of formation evaluation

COURSE CONTENT
Logging objectives • Invasion profile • Challenge of borehole geophysics • Passive electrical properties of earth materials • Resistivity measuring tools, normal, induction, laterlog • Reservoir/non-reservoir discrimination • Multi-sensitivity logs, GR, SGR, Pe • Depth measurements and control • Borehole calipers • Forcivity-mineralogy logs, density, neutron, sonic • Porosity determination in clean formations • Formation resistivity factor • Conductivity of shales • Forcivity log crosstalks and mineralogy identification • Partially saturated rock properties and Archie Equation • Linear movable oil plot • Reconnaissance techniques, Rea, FPA, logarithmic scalar • Porosity-resistivity crosstalks • Permeability relationships • Nuclear magnetic resonance • Use of pressure measurements • Computerized log evaluation • Sidewall coring • Recommended logging programs


Coring and Core Analysis – CCA

FOUNDATION 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 unitization 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, participants are given hands-on problems and practical laboratory and field examples, which reinforce the instruction. *Laboratory visit with core analysis measurement demos (where feasible).

DESIGNED FOR
Petrophysicists, reservoir engineers, exploration and development geologists, core and log analysts, geophysicists, drilling and completion engineers, and oil company research and development staff.

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 standard core analysis (e.g., wettabiliity, relative permeability, capillary pressure, and reservoir fluid distribution for reservoir engineering and petrophysical evaluation)
• Prevent or spot errors in core analysis vendor reports (quality control)
• Select samples for special core studies
• Correlate core and log data

COURSE CONTENT
Coring and core analysis objectives • Coring hardware and maximizing core recovery • Core-handling, website procedures, and preservation methods • Sidewall coring and analysis • Organizing effective laboratory programs • Forcivity, 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 nmr log calibration, acoustic, nuclear, and electrical properties) an introduction to rock mechanics • Wettabiliity, relative permeability, capillary pressure, and reservoir fluid distribution • Data integration in reservoir simulation • Final problem: design of coring and core analysis program


Mudlogging – MDLG

FOUNDATION 5-Day
Mud logging, also known as surface logging, is the creation of a detailed record of a borehole by examining the bits of rock or sediment brought to the surface by the circulating drilling medium (most commonly mud). Mud logging is usually performed by a third-party mud logging company. This provides well owners and producers with information about the lithology and fluid content of the borehole while drilling. Historically it is the earliest type of well log.

DESIGNED FOR
New hire geologists and geophysicists; and reservoir, petroleum, and drilling engineers.

YOU WILL LEARN HOW TO
• Make well to well correlation
• Understand mud logging equipment
• Calculate the log time and advanced volumes calculations
• Describe the formation cuttings
• Integrate the cuttings evaluation with the drilling parameters
• Interpret all the acquired geological and engineering data at the rig site
• Evaluate the hydrocarbon potential of the formation
• Decide with drilling mud theology and hydraulics
• Handle, process and describe cores
• Evaluate different types of pressure
• Handle formation pressure to minimize borehole risks

COURSE CONTENT
Introduction • Petroleum geology • Rig types and their components • Drilling and completing a well • Sampling and cuttings analysis • Volume calculations • Advanced sample evaluation • Formation pressures • Borehole problems


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 coal-bed 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
Extend Learning into the Field

<table>
<thead>
<tr>
<th>PG</th>
<th>2019 COURSES WITH FIELD TRIPS</th>
<th>LOCATION</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>ANALYSIS OF STRUCTURAL TRAPS IN EXTENSIONAL SETTINGS - ESS</td>
<td>Las Vegas, US</td>
<td>14-18 October</td>
</tr>
<tr>
<td>18</td>
<td>BASIC DRILLING TECHNOLOGY - BDT</td>
<td>Houston, US</td>
<td>22-26 April</td>
</tr>
<tr>
<td>18</td>
<td>BASIC DRILLING TECHNOLOGY - BDT</td>
<td>Houston, US</td>
<td>15-19 July</td>
</tr>
<tr>
<td>18</td>
<td>BASIC DRILLING TECHNOLOGY - BDT</td>
<td>Houston, US</td>
<td>16-20 December</td>
</tr>
<tr>
<td>See website</td>
<td>CO2 SURFACE FACILITIES - PF-81</td>
<td>Midland, US</td>
<td>11-14 November</td>
</tr>
<tr>
<td>21</td>
<td>CEMENTING PRACTICES-CEMENTING II - CEP</td>
<td>Houston, US</td>
<td>28 October - 1 November</td>
</tr>
<tr>
<td>25</td>
<td>CORING AND CORE ANALYSIS - CCA</td>
<td>Houston, US</td>
<td>6-10 May</td>
</tr>
<tr>
<td>25</td>
<td>CORING AND CORE ANALYSIS - CCA</td>
<td>London, UK</td>
<td>29 July-2 August</td>
</tr>
<tr>
<td>19</td>
<td>DRILLING FLUIDS TECHNOLOGY - DFT</td>
<td>Houston, US</td>
<td>21-25 October</td>
</tr>
<tr>
<td>19</td>
<td>DRILLING FLUIDS TECHNOLOGY - DFT</td>
<td>Aberdeen, UK</td>
<td>11-15 November</td>
</tr>
<tr>
<td>6</td>
<td>FIELD STUDY-HEAVY OIL RESOURCES - Hofs</td>
<td>Fort McMurray, CAN</td>
<td>26-28 August</td>
</tr>
<tr>
<td>See website</td>
<td>MECHANICAL SPECIFICATION OF PRESSURE VESSELS AND HEAT EXCHANGES - ME-43</td>
<td>Houston, US</td>
<td>23-27 September</td>
</tr>
<tr>
<td>21</td>
<td>PRIMARY CEMENTING-CEMENTING I - PCE</td>
<td>Denver, US</td>
<td>30 July-2 August</td>
</tr>
<tr>
<td>21</td>
<td>PRIMARY CEMENTING-CEMENTING I - PCE</td>
<td>Houston, US</td>
<td>16-19 September</td>
</tr>
<tr>
<td>11</td>
<td>SEQUENCE STRATIGRAPHY: AN APPLIED WORKSHOP - SQS</td>
<td>Denver, US</td>
<td>5-9 August</td>
</tr>
<tr>
<td>27</td>
<td>STRUCTURAL AND STRATIGRAPHIC INTERPRETATION OF DIPMETERS AND BOREHOLE-IMAGING LOGS - SSI</td>
<td>Denver, US</td>
<td>7-11 October</td>
</tr>
</tbody>
</table>

For a full list of field trip courses, see petroskills.com/field
Introduction to Fiber Optics for Well Surveillance – IFOS

FOUNDATION 3-Day

NEW

This course will give attendees an introduction to fiber optics sensing in reservoirs and wells. Attendees will gain an awareness of the types of fiber available, how it can be deployed, the range of measurements that can be made and how these can be applied to resolving common well and reservoir issues. The emphasis in the course will be on distributed measurements rather than point measuring sensors. The course will discuss the differences between the main types of fiber available, the underlying physics of the measurements, and the principles of operation for the different measurements and sensor types.

Attendees will learn about the variety of conveyance and deployment methods for fiber deployment in wells. Hypothetical examples will be used to illustrate the different deployment cases. The course will give the student an understanding of the type of measurement available and how the operator can use fiber measurements in combination with other data to help design an integrated surveillance program to diagnose common well and reservoir performance issues. Case examples will be used within discussion groups to explore the measurement choices.

The student will gain an understanding of the variety and range of fiber optic interrogation units available, along with the flexibility in setup that can be applied to help enhance the system’s ability to identify specific well and reservoir issues. Examples will be shown of how this data can be integrated with other data forms to help optimise the interpretation process and generate robust well and reservoir diagnosis.

DESIGNED FOR

Petroleum engineers, production engineers, petrophysicists and reservoir engineers and managers who may be making technology and tool selection decisions.

YOU WILL LEARN HOW TO

• Select the appropriate fiber deployment options for your well
• Select the appropriate measurements for well and reservoir diagnostics
• Determine the optimal fiber interrogation units for your application
• Design a basic program for a fiber surveillance
• Understand the physics behind distributed fiber measurements
• Perform basic distributed temperature and acoustic interpretations
• Integrate fiber with other data forms to generate robust well diagnostics

COURSE CONTENT

Basics of fiber construction and manufacture • How fiber is selected for downhole service • The types of measurement that are commonly made with fiber • The differences between point measurements and distributed measurements • Different fiber deployment methodologies • Selection and performance characteristics of optical interrogation units • Principles behind distributed temperature measurement (DTS) • Principles of distributed acoustic interference (DAS) • Integration of fiber data with other data forms • Case examples with different fiber applications

Introductory Geomechanics for Unconventional Reservoirs – IGUR

FOUNDATION 5-Day

NEW

This course provides an overview of petroleum geomechanics and its applications for development of unconventional plays. It is presented in three sections: (i) fundamentals of petroleum geomechanics, (ii) geomechanical characterization, stress modeling and building mechanical earth models, and (iii) geomechanical modeling for unconventional plays.

DESIGNED FOR

Geoscientists, petrophysicists, engineers, or anyone involved in unconventional reservoir development.

YOU WILL LEARN

• Essentials of rock mechanics concepts such as stress and strain tensors, rock constitutive models, and failure criteria
• To review lab measurement reports to understand mechanical rock properties and to understand the application of this data to case studies
• The key geomechanical parameters of shales
• The origins of pore pressure generation and pressure prediction and measurement methods for unconventional plays
• The processes of multi-source data collection (from cores, logs, lab and field tests, drilling, seismic, microseismic, etc.) for characterization of rock properties and in-situ stresses and building Mechanical Earth Models (MEMs)
• To analyze and interpret the geomechanical aspects of image logs, mini-fracs, and DFT tests, and drilling and completion reports
• To use different methodologies to measure/estimate in-situ stress components
• To apply geomechanical modeling to unconventional plays
• Practical approaches for drilling and mud window design
• The basic principles of hydraulic fracture design
• To characterize natural fractures and use discrete fracture network (DFN) modeling to account for their influence on hydraulic fracturing operations
• About modeling and monitoring of fault reactivation and seismicity induced by hydraulic fracturing and waste fluid disposal
• The application of data analytics and machine learning for optimization of drilling, completion, and production in unconventional plays

COURSE CONTENT

Introduction to petroleum geomechanics • Stress and strain tensors • Deformation models and failure criteria • Laboratory measurement of elastic and strength rock properties • Mechanical behavior properties and key geomechanical aspects of shale plays (fractures, brittleness, and anisotropy) • In-situ stresses and plate tectonics in the earth • Effective stresses and the role of pore pressure in geomechanics • Origins of pore pressure generation and different pore pressure measurement and calculation methods • and more...

See website for dates and locations.

IN-HOUSE TRAINING
WHEN YOU NEED IT,
WHERE YOU NEED IT.

DO YOU HAVE TRAINING NEEDS? WE CAN HELP!

In-house courses deliver private, on-site training to your group, whenever, wherever, and however you need it.

Save time, money, and travel hassles by bringing our course to your site, or any location that suits you.

If you do not have enough participants for an in-house session, we may be able to schedule an on-demand public session in your location.

For more information, or to reserve training for your team, go to petroskills.com/inhouse

See website for dates and locations.
Capillarity in Rocks

INTERMEDIATE 3-Day

The course provides detailed knowledge of how capillarity affects hydrocarbon distribution in a reservoir rock, and how the magnitude of capillary forces can be used to deduce valuable information about rock properties including pore throat sizes, pore network geometry, porosity, and permeability.

DESIGNED FOR
Geoscientists, petrophysicists, reservoir engineers, and research and development staff who want to gain fundamental insight into the capillary properties and hydrocarbon distribution in reservoir rocks.

YOU WILL LEARN HOW TO
• Select the appropriate capillary pressure measurement method for a set of desired results
• Closure correct a set of mercury/air capillary pressure data
• Fit and analyze capillary pressure data using Thomeer, Leverett-J, and Broke-Corey methods
• Determine the representativeness of a set of capillary pressure curves within a zone of interest
• Estimate permeability from a mercury/air capillary pressure curve
• Calculate pore throat sizes from a capillary pressure curve
• Create a synthetic capillary pressure curve and estimate the air permeability from a Petrophysical analysis
• Obtain values for interphase tension
• Convert mercury/air capillary pressure curves to hydrocarbon/veater capillary pressure curves
• Determine saturation-height distribution in a single-pore system rock or in a multiple- pore system rock
• Determine irreducible water saturation
• Estimate the length of a transition zone
• Determine clay-bound water using Klein-Hill-Shirley method
• Compare/contrast capillary pressure data with NMR data
• Determine the maximum column of hydrocarbon that a specific sealing layer can sustain without leaking

COURSE CONTENT
Capillary pressure applications in reservoir characterization • Rock properties from mercury/air capillary pressures • Capillary pressure data fitting methods • Representing a large number of capillary curves (averaging) • Permeability from capillary pressure curves and petrophysics • Saturation-height functions • Surface phenomena, capillarity, wettability, and interphase tension • The competition between capillary and gravity forces • Relationships between initial and residual saturations • Interpretation of single and multiple pore system rocks • Clay-bound water • Capillary pressure vs. NMR • Seal capacity

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 productivity differences
• Determine 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 • Core analysis and analysis using time-tested specific methods • Rock type from core analysis and core data •Rock type from core analysis and core data

Nuclear Magnetic Resonance (NMR)

INTERMEDIATE 4-Day

NMR today is a must-have technology for many companies because of the value-added to formation-evaluation. Some of the applications include: Matrix-independent, 'sourceless' porosity, low-resistivity-low-contrast, fresh-water reservoirs, and carbonates. NMR completes the formation-evaluation story for many companies now using the technology regularly because it either validates conventional log and test data or it independently provides an answer unavailable from other sources. Certainly, in many instances, the absence NMR data too frequently leaves the formation-evaluation story incomplete and uncertain. This four-day, Petroskills NMR Petrophysics course will provide geoscientists and engineers with a basic to intermediate skill-level for using NMR data in reservoir characterization workflows. Course design is a balance between information transfer, discussion, training, and practical exercise. The expectation is that participants will return to their jobs with the skill-set shown below.

DESIGNED FOR
Geoscientists and engineers interested in learning how NMR technology fits within the reservoir characterization/reservoir modelling workflow and how to use the data to best advantage.

YOU WILL LEARN HOW TO
• Understand how NMR works for petrophysical applications
• Understand the language of NMR technology (mnemonics)
• Use NMR data for core and log applications
• Understand how NMR fits into predictive rock-type schemes
• Plan core and log acquisition programs
• Identify data quality indicators and what they mean
• Use core data for log calibration
• Use contractor deliverable to produce an interpretation
• Fit NMR data with conventional log data
• Process raw data

COURSE CONTENT
Basics of NMR technology • NMR Core Analysis • Rock typing from NMR core data and its relationship to cores • Pore geometry and what it means for the interpretation of NMR data • NMR logs • Job planning • Log quality control • Working with NMR data (various exercises throughout the course)

Shaly Sand Petrophysics – APS

INTERMEDIATE 5-Day

This course tackles the important and nontrivial problem of practical formation evaluation in shaly sand provinces. The presence of clay minerals and shale laminations strongly affects the physical properties of the reservoir rock and induce significant effects on the response of most logging tools; these perturbations often result in low resistivity/low contrast pay zones that can be significant hydrocarbon producers but are often overlooked. A properly designed analytical program (cores and logs) for the evaluation of shaly sands can add significant reserves in existing fields and can allow for the rapid identification of potential by-passed pay zones in exploration wells. The course is practical and participants are given laboratory and field problems to emphasize the instruction. At the end of the course, the participants will be able to identify and evaluate pay intervals in shaly sands.

DESIGNED FOR
Petrophysicists, geologists, geophysicists, engineers, and explorationists involved in all phases of reservoir evaluation in shaly sand provinces.

YOU WILL LEARN HOW TO
• Determine the nature, volume, and distribution of clay minerals and shales in shaly sands and their impact on the analyses of cores and logs
• Integrate petrophographic, core, and log data to significantly improve reservoir evaluation in shaly sands and other rocks contain significant amounts of microporosity
• Bring order out of chaos on porosity-permeability cross-plots using rock typing
• Evaluate effective and total porosity, fluid saturations, and producibility of shaly sands using time-tested specific methods
• Evaluate the strengths and weaknesses of advanced logging tools for characterization of shaly sands

COURSE CONTENT
Review of log interpretation techniques in clean formations • Core analyses and applications of specific core tests • Petrographic analysis (thin section, X-ray diffraction SEM/EDS) for shaly sand evaluation • The nature of clay minerals and shale laminations and how they are distributed in shaly sands • Influence of clay minerals and shale laminations on petrophysical properties • Occurrence of clay minerals and shale laminations in reservoir rocks and relation to depositional environment and diagenesis • Determination of petrophysical, core, and log data for evaluation of shaly sands • Effects of clay minerals and shale laminations on log responses in shaly sands; various methods of shale content evaluation • Models for porosity and saturation determination: total and effective porosity; and Archie, Waxman-Smits, Dual Water and Juhl's saturation methods • Prediction of permeability and producibility from logs in shaly sands: Identification of bypassed pay • Use of advanced logs (NMR, BHI, Dipmetry) integration with core data for purposes of evaluation
Structural and Stratigraphic Interpretation of Dipmeters and Borehole-Imaging Logs – SS1

INTERMEDIATE 5-Day FIELD TRIP

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 paleocurrent directions, 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 sedimentologic, 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 orientation, improve horizontal well placement, provide input into flow simulations
- Determine paleocurrent orientations, define stratigraphic compartments, quantify wavy 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 • General use and interpretation of dipmeters • Image processing • 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, scour marks, surfaces, slumps • Determination of paleocurrent directions • Interpretation of borehole images in various depositional settings • Application of image data in geocellular modeling and reservoir characterization • Integration of image data with core, mapping, seismic, petrophysical, and production data

Applied Rock Mechanics – ARM

SPECIALIZED 3-Day

Understanding the stress, strain, and failure mechanisms of rocks and their response to earth stresses can lead to enormous economic benefits in all phases of petroleum reservoir development. Over the last ten years, rock mechanics has emerged as a critical technology capable of lowering financial risk in drilling and well completions, qualifying exploration and development opportunities, and improving hydrocarbon productivity. Rock mechanics is a vital decision-making tool for high-angle and horizontal drilling, unconventional reservoirs, deepwater drilling, massive hydraulic fracturing, and completing poorly cemented formations. Borehole instability, casing shear, subsidence, stuck pipe, and sand control issues cost the petroleum industry many billions of dollars annually. New theory and experimental methods as well as straightforward computer modeling techniques have provided insight into developing prospects in complex geological basins and harsh drilling environments. In Applied Rock Mechanics, students are provided with basic theory, laboratory demonstrations, hands-on exercises, and computer modeling demonstrations. In addition to a comprehensive manual, software is provided for the student to perform wellbore stability calculations. The practical application of rock mechanics is emphasized. Applied Rock Mechanics is designed to familiarize engineers and geoscientists with the necessary tools for immediate field application.

DESIGNED FOR
Petrophysicists, drilling engineers, completion engineers, exploration and development geologists, reservoir engineers, core and log analysts, geophysicists, and oil company research and development staff.

YOU WILL LEARN HOW TO
- Determine the stress, strain, and failure mechanisms of rocks
- Apply rock mechanics concepts and generate economic benefits in all phases of reservoir development

COURSE CONTENT
Introduction to rock mechanics and geomechanical principles • Basic mechanics • Rock mechanical properties • Pressure, stress, and loads • Geomechanics and structural geology • Wellbore and field measurement of in-situ (earth) stresses • Overview of common rock mechanics tests (lab demonstrations) • Stress orientation techniques • Elastostatics and visco-elastic models of rock behavior • Borehole stability • Sand control • Fracture mechanics • Unconventional reservoir applications • Reservoir engineering applications • Wireline log predicted mechanical properties • Data integration

Cased Hole Formation Evaluation – CH

SPECIALIZED 4-Day

This course teaches skills necessary to practice the art and science in accurately determining remaining hydrocarbons using modern dual-detector and emerging multi-detector pulsed neutron (PA) tools. The latter can compute multiple petrophysical parameters simultaneously and delineate gas better, especially in low porosity, but add to data and interpretation complexity. The course discusses measurement-to-interpretation techniques used by various players and thus offers an insight into their effectiveness in conditions of increasing wellbore and formation complexities. The user will gain a better understanding of why tools from different service companies, often recording similar raw data in near-identical conditions, may differ significantly in their predictions. The course will help users of the technology make targeted tool choices, plan logging jobs better, and perform in-house interpretation if needed.

DESIGNED FOR
Geologists, formation evaluations specialists, completion and production engineers, and managers who may be making technology- and tool-choice decisions.

YOU WILL LEARN HOW TO
- Determine adequacy of PNC capture vs. C/D logging methods for saturation calculation, especially through complicated well bores and in complex formations
- Calculate water and steam saturations from Pulsed Neutron Capture (PNC) Logs
- Correct petrophysical calculations for the influence of shaliness
- Distinguish gas/steam from liquids
- Compute oil saturation directly from Carbon/ Oxygen techniques
- Locate water entry and judge zonal communication
- Judge where specialty methods, such as Log-inj-Log tools to estimate remaining oil vs. residual oil saturation, pseudo-density, etc., may not work
- Make appropriate tool choices
- Interpret formation characterization and plan logging jobs

COURSE CONTENT
Basis and application of nuclear logging in general (briefly) and cased-hole logging in particular • Attributes of various modern dual-detector and emerging multi-detector cased-hole logging tools used in the industry • Cased-hole application of pulsed neutron capture (PNC) methods in clean and shaly formations, carbon/oxygen logging in low to variable salinity conditions in water and steam floods where PNC methods do not work, and direct neutron (PNM) methods to Locate oil, gas, liquid, or steam/liquid contacts • Compute water, oil and gas/steam saturation (in steam floods), and residual saturation using log-inject-log methods • Application of above in open-hole completions • Differences in saturation interpretation methods across vendors • Oxygen activation to locate water entry • Job planning and best practice parameters for successful monitoring

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, PCI, RTD, and FRF, 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 accessing 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 geotechnical engineers in 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/plan 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 (scatterplots, excess pressures, normalization)
- Design and interpret Mini-DST and VIT 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, PFL, and compositional gradient; excess pressure plot for compartmentalization; normalization plot for depleted reservoir • 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 VT; practical aspects of well productivity and deliverability potential estimates

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denver, CO</td>
<td>7-11 Nov</td>
<td>$4735</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>13-17 Nov</td>
<td>$4565</td>
</tr>
</tbody>
</table>

† Includes field trip

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston, TX</td>
<td>18-20 Nov</td>
<td>$3365</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>14-17 Oct</td>
<td>$4055</td>
</tr>
</tbody>
</table>

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dubai, UAE</td>
<td>16-20 June</td>
<td>$9645</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>22-26 Apr</td>
<td>$4525</td>
</tr>
</tbody>
</table>

All classes available at your location. Contact us today. +1.918.828.2500 petroskills.com | +1.800.821.5933 (toll free North America)
Basic Petroleum Technology Principles – 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 find, then 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 geological 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.

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
• Petrophysics 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 on conventional and unconventional reservoirs including initial reserve estimation and the subsequent field development. Drilling and operations • Well completions and workovers • Production operations • Reservoir recovery mechanisms • Surface processing

Basic Petroleum Technology – BPT

Basic Drilling, Completion and Workover Operations – BDC

BASIC  5-Day

This course presents the basics of drilling and completion operations, plus post-completion enhancement (workovers). Participants will learn to visualize what is happening downhole, discover what can be accomplished, and learn how drilling and completion can alter reservoir performance. Learn to communicate with drilling and production personnel. No experience or prerequisites are required.

DESIGNED FOR
Technical, field, service, support, and supervisory personnel desireing to gain an understanding of wellbore operations. Excellent for cross-training of other technical disciplines such as reservoir and facility engineers, geoscientists, supervisors, service personnel, and anyone who interacts with drilling, completion orworkover engineers.

YOU WILL LEARN
• How to comprehend drilling and workover reports
• What can be done within open-hole and cased wells, as a part of reservoir management
• How drilling practices can optimize cash flow and ultimate recovery
• How to communicate with drilling and production personnel

COURSE CONTENT
Overview of the drilling process • Language of drilling, completing, and well intervention • Drillstring components: bits and accessories • Hole problems, stuck pipe, side-tracking and fishing • Cores and coring • Electric logging, MWD, LWD • Casing design and installation • Primary and remedial cementing • Directional, horizontal, multilateral and under-balanced drilling • Wellhead equipment and trees • Options for completions and workovers • Tubing, packers and completion equipment • Safety and flow control devices • Open hole completions • Perforating • Coiled tubing operations • Wireline techniques • Well stimulation - surfactants, solvents, acids, hydraulic fracturing • Formation and sand control - mechanical retention, chemical consolidation, and gravel packing • and more...

Basic Drilling, Completion and Workover Operations – BDC

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

VIRTUAL DELIVERY $3930
PETROSKILLS.COM/BDCONLINE

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 independents to super majors.

DESIGNED FOR
A basic foundational level 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, geologists, petrophysicists, 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

Self-paced, virtual course – start anytime.

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>11-15 MAR</td>
<td>$4225</td>
</tr>
<tr>
<td></td>
<td>7-11 JUN</td>
<td>$4225</td>
</tr>
<tr>
<td></td>
<td>18-22 NOV</td>
<td>$5120</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3-7 JUNE</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td></td>
<td>4-8 NOV</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td>NEW ORLEANS, US</td>
<td>6-10 MAY</td>
<td>$4170</td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>13-17 MAY</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>23-27 SEP</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>14-18 OCT</td>
<td>$4170</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>6-12 JULY</td>
<td>$4220</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>26-30 AUG</td>
<td>$4220</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>9-13 DEC</td>
<td>$4225</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 OCT</td>
<td>$5120</td>
</tr>
<tr>
<td></td>
<td>12-16 AUG</td>
<td>$4935+VAT</td>
</tr>
</tbody>
</table>

FOR MORE INFORMATION, VISIT PETROSKILLS.COM/BPTONLINE

See website for dates and locations.
Basic Petroleum Geology – BG

BASIC 5-Day

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
• Of petroleum origin, migration, and trapping
• About geological time and history
• About plate tectonics and petroleum

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

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 filling material, 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
• 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 virtual course which is an enhanced version of the face-to-face public session.

23 APR - 19 JUN $4325
18 JUN - 14 AUG $4325
10 SEP - 6 NOV $4325

PETROSKILLS.COM/BLENDED-BGP

2019 Schedule and Tuition (USD)

HOUSTON, US
BAKERSFIELD, US
LONDON, UK
10-14 JUN
16-22 MAY
24-28 JUN
$4335
$4225
$4935+VAT

DENVER, US
11-15 MAR
$4400

HOUSTON, US
29 APR-3 MAY
$4225
29 JUN-3 JUL
$4225

PetroSkills

Keep current and ensure you always have the latest information by joining our email list.

You Will Receive:
• Complimentary learning and development resources
• Information on new courses and instructors
• Additional public course locations and dates
• Invitations for PetroSkills events and conferences

Simply go to petroskills.com/emails_signup

All classes available at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Carbonate Reservoirs – PCR

FOUNDATION 5-Day

This rigorous workshop is a must for geoscientists dealing with exploration and exploitation of carbonate reservoirs. The seminar emphasizes the complexity of carbonate porosity, its modification and evolution will be discussed in a sea-level driven sequence stratigraphic framework. Case histories and exercises from around the world will be utilized throughout to illustrate important concepts. These exercises and case histories give the participant experience in developing viable exploration and exploitation strategies for carbonate terrains.

In 2013 a new book, Carbonate Reservoirs, was prepared by Dr. Moore and Wade specifically to accompany this course and is furnished to all course participants.

DESIGNED FOR

Exploration and development geologists, exploration and development managers, and geophysicists as well as engineers with some geologic background will benefit.

YOU WILL LEARN HOW TO

• Recognize basic characteristics of carbonates important to reservoir development
• Understand how sequence stratigraphy can be applied to carbonates and mixed carbonate-siliciclastic systems
• Understand the complexities of carbonate pore systems
• Recognize the nature of carbonate porosity modification during diageneisis and the role of sea-level and climate in porosity modification and gross reservoir heterogeneity
• Develop viable exploration and exploitation strategies in carbonate terrains by working with subsurface datasets

COURSE CONTENT

Basic nature of carbonates • Carbonate facies models • Basic concepts of sequence stratigraphy • Relationship of stratigraphic patterns to changes in subsidence rates • Sequence stratigraphic models including the ramp, the rimmed shelf, the escarpment margin, the isolated platform, and the mixed carbonate-siliciclastic shelf • Characteristics of carbonate pore systems • Diagenesis, porosity evolution, and porosity distribution at the time of burial • The fate of early-formed porosity during burial • The potential value of diolomitization, including by hydrothermal processes • The problem of H5 in carbonate reservoirs • Natural fractures in carbonates • Case histories and exercises from the Americas, Europe, and Asia • Exploration and exploitation strategies in carbonate and mixed terrains

Sandstone Reservoirs – SR

FOUNDATION 5-Day

This course is essential for geoscientists and engineers involved in the exploration and development of clastic reservoirs. It focuses on methods that can be used to improve the prediction of reservoir size, shape, trend, and quality through detailed analysis of depositional environments. The sedimentary characteristics of each of the principal clastic depositional systems are presented in detail, using examples from different environments, outcrops, cores, wireline logs, and test production data from oil and gas fields in various parts of the world (United States, North Sea/Atlantic, Africa, Middle East, Far East, etc.). Practical exercises are taken from each of the principal depositional settings and involve detailed mapping, interpretation of core and log characteristics, and integration of data from FMI logs. Emphasis is placed on the application of fundamental sedimentary principles (modern, ancient, and subsurface) to actual subsurface data so that the participants can immediately use the information in their exploration and development activities.

DESIGNED FOR

Geologists, geophysicists, petrophysicists, reservoir and production engineers, exploration-production managers, all team members involved in reservoir characterization, and technicians working with clastic reservoirs. The course provides a refresher in new concepts in this field for geoscientists at a foundation level.

YOU WILL LEARN HOW TO

• Interpret clastic depositional environments using data from cores, cuttings and wireline logs (including FMI)
• Apply new sequence stratigraphic concepts to clastic reservoirs
• Correlate wells using knowledge of depositional environment
• Predict reservoir size, shape, trend and quality

COURSE CONTENT

Genetic stratigraphic analysis • Depositional architecture • Basins and units • Wireline logs and conventional cores • Seismic and sequence stratigraphy • Recognition of depositional systems • Process-response facies models • Integrated genetic stratigraphy • Analysis of clastic depositional systems • Alluvial fan • Fluvial • Estuarine • Deltaic • Shoreline • Shelf • Deepwater systems • Incised sequences • Shelf margins and linked downslope systems • Characteristic log patterns • Flow units • Prediction of reservoir size, shape, trend, quality • How to select optimum well locations • Lateral continuity and quality of seals • Sedimentary controls on porosity, permeability, saturation • Reservoir exploration and production case histories • Exploration and production scaled case histories

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’s 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, cores, 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. Note: 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 hazards
• 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 • Tendering and contracting • Reporting: geological data, petrophysical data, pressure data • Exercises: cores, cuttings, quick look, pressures, daily drilling report

Production Logging – RMP

INTERMEDIATE 5-Day

Production logging refers to acquiring a suite of logging measurements in a completed well that is either on injection or production to evaluate the flow performance of the well or the reservoir. Special purpose production logging instruments can evaluate the well completion or look behind the pipe to evaluate the formation and its fluids in the near-well bore vicinity. Production logs are playing an increasing role in modern reservoir management by providing the only means of directly identifying downhole fluid movement. This course will cover single-phase and multi-phase fluid flow in pipes, the theoretical bases of production logging techniques, production log interpretation, and operational considerations in acquiring production logs. Numerous field examples are used to illustrate the principles of production log interpretation.

DESIGNED FOR

Petroleum and drilling engineers and managers, reservoir engineers, subsurface engineers, production engineers/technologists, petrophysicists, log analysts, and anyone interested in understanding production logs and case-hole surveys.

YOU WILL LEARN HOW TO

• Measure zonal inflow in producing wells using temperature measurements
• Measure multi-phase flow using temperature, spinner (flowmeter), and fluid holdup measurements
• Define injection profiles using temperature, radioactive tracer, and spinner (flowmeter) measurements
• Identify flow behind pipe with temperature, radioactive tracer or noise logs
• Interpret cement bond logs and ultrasonic logs to determine cement quality
• Measure flow inside and outside casing with pulsed neutron tools
• Apply specialty tools (array holdup and spinners and pulsed neutron tools) for flow profiling in high angle/horizontal wells
• Confirm the location of some types of completion components using pulsed neutron measurements
• Design a logging program using the appropriate production logging services for well diagnosis and reservoir surveillance

COURSE CONTENT

Wellbore environment and tool deployment considerations • Depth control issues and natural gamma ray logging • Cement bond logs • Ultrasonic imaging logs • Conventional temperature logs • Conventional spinner (flowmeter) logs • Conventional fluid holdup logs (gamma density, capacitance, differential-pressure) • Radioactive tracer logs • Noise logs • Temperature from fiber optic cables • Pulsed neutron capture logs (including oxygen activation and nonradioactive tracers) • Pulsed neutron spectroscopy logs • Array mini-spinner logs • Array fluid holdup logs (optical, capacitance, and resistance) • Multiphase flow and slip velocity • and more...

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANADA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CALGARY</td>
<td>21-25 OCT</td>
<td>$4270+GST</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>22-26 JULY</td>
<td>$4320</td>
</tr>
<tr>
<td>OGDEN, US</td>
<td>17-21 NOV</td>
<td>$5445+HST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>4-8 MAR</td>
<td>$4125</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3-7 JUNE</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>12-16 AUG</td>
<td>$4425</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>9-13 DEC</td>
<td>$5320</td>
</tr>
</tbody>
</table>

*plus computer charge
Basic Reservoir Engineering – BR

**BASIC 5-Day**

**FOUNDATION**

This course will cover current practices for evaluating, drilling, and completing these challenging reservoirs. Discussions and exercises will include a focus on the limitations of many of the current tools and technologies. Information and opportunities for many current and international shale plays will be described. The participant should leave the course with a foundational understanding of value-adding shale gas resource practices and an insight into determining the critical reservoir and stimulation parameters used to predict a potential commercial resource play.

**DEIGNED FOR**

Reservoir, production and completion engineers, petrophysicists, geologists, geophysicists, and other professionals who desire a thorough overview of shale resource development.

**YOU WILL LEARN HOW TO**

- Describe the resource potential and economic importance of shale gas and shale oil
- Describe the similarities/differences between shale gas, tight gas, and coalbed methane
- Recognize and describe shale play differences and critical reservoir properties to identify the sweet spots
- Estimate gas and oil in place
- Apply different resource evaluation techniques recognizing the advantages and disadvantages of each technique
- Apply drilling, completion, and stimulation technology to shale gas and shale oil formations
- Evaluate and forecast individual well and reservoir performance
- Determine how to estimate well reserves in both PDP (proved developed producing) and PLD (proved undeveloped) categories

**COUSE NT CONTENT**

Current shale plays and their global impact
- Reservoir characterization and evaluation: organic quality, rock quality and mechanical quality properties; geological setting; rock properties; petrophysical considerations; the role of seismic data in field evaluation
- Drilling: vertical vs. horizontal wells; pilot holes; fluids; MWD and LWD; wellbore sizes and lateral; drilling challenges; mechanical considerations
- Completions: cased vs. open hole; perforation schemes; stimulation design and considerations; case histories
- Field trials and pilots: strategies for implementing a pilot program to optimize well drilling, completion, understanding Stimuluted Rock Volume (SRV) using microseismic, fiber optics, production logs, and other resources
- Production forecasting and reserve calculations: volumetrics; performance analysis; simulation; resource development; decline curve analysis; handling uncertainty in estimates
- Logistics, pad design, field development, water resources and the social license
- Evaluate and forecast individual well and reservoir performance
- Determine how to estimate well reserves in both PDP (proved developed producing) and PLD (proved undeveloped) categories

Reservoir Engineering for Other Disciplines – REO

**FOUNDATION 5-Day**

This course gives the non-reservoir engineer a better understanding of reservoir engineering practices and limitations. The course is designed to provide a good understanding of reservoir engineering processes, the required data, and the limitations on the engineers’ analysis and interpretations. The course also provides engineers who are already well trained in the upstream petroleum industry technical disciplines with an understanding of the current state-of-the-art practice of reservoir engineering.

**DEIGNED FOR**

Engineers and geoscientists now working in an asset environment where they need to better understand the practices and limitations of the methods and procedures employed by the reservoir engineers with whom they work. Participants should have three or more years of technical experience in the upstream petroleum industry.

**YOU WILL LEARN HOW TO**

- Utilize the tools and techniques of the reservoir engineer
- Apply the principles of reservoir engineering
- Develop reservoir, well performance and asset management options

**COUSE NT CONTENT**

Distribution of Reservoir Properties: structure, fluid contacts, water saturation, and pressure
- Rock Properties: porosity, permeability, capillary pressure, and relative permeability
- Fluid Properties: phase behavior of reservoir fluids; properties of gas, oil, and water; PVT Sampling; and PVT laboratory reports
- Volumetric Calculation of Initial Hydrocarbons in Place: oil in place, gas in place, addressing uncertainty using probabilistic methods, reserve booking practices, and reservoir recovery efficiencies
- Material Balance Methods: oil reservoir balance, Havlena method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs
- Fluid flow and well performance: radial and linear flow, transient, pseudosteady state, steady state flow regimes, productivity of vertical and horizontal wells
- Aquifer influx
- Immiscible Displacement: fluid displacement process, fractional flow, Buckley Leverett, wedge, water under running, and gas overriding
- Coning and Cuspining: description of process, critical rates, using horizontal wells
- Reservoir Types and Drive Mechanisms: gas reservoirs - volumetric, water drive and compaction drive; oil reservoirs - solution gas drive, water drive, water flood, gas cap expansion, conduction drive, naturally fractured and critical reservoir fluid flow reservoirs
- Reservoir Simulation: why simulate, types and Drive Mechanisms: gas reservoirs - volumetric, water drive and compaction drive; oil reservoirs - solution gas drive, water drive, water flood, gas cap expansion, conduction drive, naturally fractured and critical reservoir fluid flow reservoirs
- Reservoir Modeling: why simulate, types of simulators and simulation models, setting up a simulation model, conducting a simulation study
- Field Development Planning: characteristics, planning tools, deliverability issues, determining a well count and rate forecast

**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 their 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-functional 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 specific 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.

**DEIGNED 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

**COUSE NT CONTENT**

Business value drivers and selection criteria
- The scale and resolution of data
- Variograms, correlation length
- Time, rock, and flow units
- Seismic attributes
- Upscaling, streamline simulations
- Decision trees; value of information
- Giving and receiving feedback
- The future of Reservoir Characterization
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 waterflood sweep efficiency

Production Technology for Other Disciplines – PTO
FOUNDATION 5-Day
PTO is an asset team course, as it introduces a broad array of important daily Production Technology practices. Terminologies, expressions, acronyms, and basic calculations regularly utilized by production teams are covered. Emphasis is upon proven technology required to effectively develop and operate an asset in a multidisciplinary development environment. Practical application of technology is emphasized. Nodal analysis examples to assess well performance are set up. Well completion equipment and tools are viewed and discussed. Exercises include, basic artificial lift designs, acidizing programs, gravel pack designs, and fracturing programs. Shale gas and oil development challenges are thoroughly explained. Horizontal and multilateral technology is presented.

DESIGNED FOR
Exploration and production technical professionals, asset team members, team leaders, line managers, IT department staff who work with data and support production applications, data technicians, executive management, and all support staff who require a more extensive knowledge of production technology and engineering.

YOU WILL LEARN HOW TO
• Apply and integrate production technology principles for oilfield project development
• Choose basic well completion equipment configurations
• Perform system analyses (Nodal Analysis™) to optimize well tubing design and selection
• Perform basic artificial lift designs
• Apply the latest shale gas and oil extraction technologies
• Understand the chemistry and execution of sandstone and carbonate acid jobs
• Design sand control gravel pack completions
• Evaluate candidate selection to conduct a hydraulic fracturing campaign
• Apply new production technology advances for smart well completions
• Maximize asset team interaction and understand the dynamics between production technology and other disciplines

COURSE CONTENT
Role and tasks of production technology • Completion design • Flow and outlet performance • Artificial lift well completion systems • Artificial lift designs • Artificial lift selection • Run types • Optimize artificial lift • Design sand control gravel pack completions • Evaluate candidate selection to conduct hydraulic fracturing campaigns • Apply new production technology advances for smart well completions • Maximize asset team interaction and understand the dynamics between production technology and other disciplines

Basic Petroleum Economics – BEC3
FOUNDATION 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.

COURSE CONTENT
• Cash flow techniques applicable in economic evaluations
• How to use economic criteria to choose investments
• Models to weigh risk and uncertainty

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 they can apply in multi-discipline evaluation teams. The focus is on designing and solving decision models.

COURSE CONTENT
• Describe the elements of the decision analysis process and the respective roles of management and the analysts
• 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 decision alternatives with decision tree analysis
• Develop and solve decision trees for value of information (VOI) problems

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

4 MAR - 24 MAY $4325
29 MAY - 23 AUG $4325
9 SEP - 6 DEC $4325
PETROSKILLS.COM/VIRTUAL-PTO

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>14-18 OCT</td>
<td>$4525</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>15-19 JULY</td>
<td>$5235+VAT</td>
</tr>
<tr>
<td>ABU DHABI, UAE</td>
<td>16-18 JUNE</td>
<td>$4025+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>26-28 AUG</td>
<td>$3175</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>11-13 FEB</td>
<td>$3185</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>22-24 JULY</td>
<td>$3865</td>
</tr>
<tr>
<td>THE HAGUE, NLD</td>
<td>16-18 SEP</td>
<td>$3715+VAT</td>
</tr>
<tr>
<td>SAN FRANCISCO, US</td>
<td>11-13 NOV</td>
<td>$3145</td>
</tr>
</tbody>
</table>

2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>16-18 JUNE</td>
<td>$4025+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>26-28 AUG</td>
<td>$3175</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>11-13 FEB</td>
<td>$3185</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>22-24 JULY</td>
<td>$3865</td>
</tr>
<tr>
<td>THE HAGUE, NLD</td>
<td>16-18 SEP</td>
<td>$3715+VAT</td>
</tr>
<tr>
<td>SAN FRANCISCO, US</td>
<td>11-13 NOV</td>
<td>$3145</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>15-19 JULY</td>
<td>$5220</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>7-11 OCT</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>
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.

**DESIGNED FOR**

Exploration and production personnel with a background in geoscience, petroleum engineering or drilling should attend. If you are a facilities engineer, we refer you to our Project Management for Engineering and Construction (PFM2) and Project Management for Upstream Field Development (PFMD) courses.

**YOU WILL LEARN HOW TO**

- Navigate the staged development process
- Manage the interfaces among exploration, drilling and facility groups
- Properly define a scope of work
- Create a realistic, integrated schedule
- Find and reduce petroleum development risks
- Develop a high-performance team
- Capture lessons learned

**COURSE CONTENT**

The staged development process • Scope definition • Scheduling tools • Manpower resources • Finding and mitigating risks • Learning, continuous improvement, and quality control • Project team management • Petroleum case studies and exercises

---

Essential Leadership Skills for Technical Professionals – OM23

**BASIC** 5-Day

In the oil and gas industry, skillful and competent leadership is extremely important for safety, productivity, and asset management. The 21st century brings new emphasis on leaders, new communication technologies, increased focus on safety, information overload, workforce dynamics, asset integrity, and many other concerns which challenge even the most proficient leader/manager. How do we blend these new challenges with tried and true wisdom of success? There are skills to learn that will help you be more effective, with less stress. In this seminar/workshop you will explore your internal drivers and learn how to combine them with new skills for greater effectiveness. This seminar/workshop will include self-assessment, discussion, lecture, readings, role-playing, games, video examples, and creation of participant action plans. This course will help you unleash natural motivation in your team. Your stress level can be lowered by working more efficiently and effectively by tapping the emotional intelligence of your team and co-workers.

**DESIGNED FOR**

Anyone who has new responsibilities to lead a team. Supervisors, team leads, managers, and others interested in becoming a better leader and a contributing team member will greatly benefit from this one-week experience. Many may want to take this seminar/workshop more than once for continuous improvement.

**YOU WILL LEARN HOW TO**

- Become a more effective leader by overcoming the “tyranny of the urgent” with better time management
- Make better decisions by assessing when to make what kind of decisions
- Help others develop themselves by unleashing their career motivation
- Have more effective communications with technical and non-technical teams by developing the patience to let the team do its work
- Recognize and resolve conflicts before they get out of control by early detection of conflicts, when they’re simpler and have less impact
- Develop the ability to lead an empowered team of technical professionals by more effective delegation
- Reduce your own stress level by teaching yourself how to lower your stress with clearer thinking
- Learn assessment techniques for yours and other’s people skills by raising the competency levels of yourself and your team
- Walk your talk by getting buy-in for your ideas and vision
- Leading by example

**COURSE CONTENT**

The nature of teams • Leadership vs. management • Self-centering and tangential leadership • Listening • Motivation • Group dynamics • Conflict management • Teambuilding • Critical Thinking and taking action

---

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 Make you more confident in your writing

**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, bullets, and short paragraphs as the primary writing mode

---

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
- Define team roles and relationships
- 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
### Applied Environmental Management Systems – AEM

**FOUNDATION**

**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 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 (OH&S) 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**

Context 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

**2019 Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>15-19 JUL</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>17-21 JUN</td>
<td>$5035</td>
</tr>
</tbody>
</table>

**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 (ISO9001, ILO OSH-2001, IOTP 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 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 HSE, 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 • OH&S policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities (aspects, compliance, objectives, responsibilities, and planning to achieve them) • Support (competence, awareness, communication, documentation) • Operational control • Emergency preparedness • Performance evaluation (monitoring, internal audit, management review) • Improvement

**2019 Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>21-25 OCT</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>25-29 NOV</td>
<td>$5035</td>
</tr>
</tbody>
</table>

Listen to what course attendees are saying! Go to petroskills.com/listen
IN-HOUSE TRAINING
WHEN YOU NEED IT,
WHERE YOU NEED IT.

DO YOU HAVE TEAM TRAINING NEEDS? WE CAN HELP!

In-house courses deliver private, on-site training to your group, whenever, wherever, and however you need it.

Save time, money, and travel hassles by bringing our course to your site, or any location that suits you.

If you do not have enough participants for an in-house session, we may be able to schedule an on-demand public session in your location.

For more information, or to reserve training for your team, go to petroskills.com/inhouse
### TO VIEW OUR COURSES IN OTHER DISCIPLINES, VISIT:

#### Subsurface
- Introductory and Multi-Discipline
- Geology
- Geophysics
- Reservoir Engineering
- Well Construction/Drilling
- Production and Completions Engineering
- Unconventional Resources
- Integrated - Heavy Oil
- Petroleum Data Management

#### Facilities
- Gas Processing
- Process Facilities
- Offshore & Subsea
- Pipeline Engineering
- Instrumentation, Controls & Electrical
- Mechanical Engineering
- Reliability Engineering
- Procurement/Supply Chain Management
- Refining

#### Operations & Maintenance

#### Health, Safety, Environment

#### Petroleum Business and Professional Development
- Petroleum Professional Development
- Petroleum Business
- Project Management

---

**SIGN UP FOR PETROSKILLS EMAILS**
PetroSkills Blended Learning Skill Modules™ combine industry knowledge, expertise, content, and technology to develop workforce competency with the added benefit of:

✓ **Reduced time to competency**
✓ **Eliminated travel expense**
✓ **Flexibility—less time away from work**
✓ **Learning applied at point of need**

**Courses Available Now:**
- Applied Reservoir Engineering
- Basic Drilling, Completion, and Workover Operations
- Basic Geophysics
- Basic Petroleum Technology Principles
- Basic Reservoir Engineering
- Basics of Rotating and Static Mechanical Equipment
- Casing Design Workshop
- Completions and Workovers
- Foundations of Petrophysics
- Gas Conditioning and Processing
- NODAL Analysis Workshop
- Process Safety Engineering
- Production Operations 1
- Production Technology for Other Disciplines
- Scale Identification, Remediation and Prevention Workshop

For more information, please visit [petroskills.com/blended](http://petroskills.com/blended)