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

**Basic Reservoir Engineering – BR** leads off the section as a perfect basic overview for anyone working with reservoir definition, development, or production. The next course, **Applied Reservoir Engineering – RE** on page 2, represents the core of our reservoir engineering program and the foundation for all future studies in this subject.

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

- Dr. Akhil Dattagupta
- Dr. Rodolfo Camacho-Velasquez
- Dr. Asnul Bahar
- Dr. Rosalind Archer
- Mr. Jeff Aldrich
- Dr. George Slater
- Dr. John Spivey
- Dr. Dave Walden

### Course Progression Matrix

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology and Geophysics</td>
<td>Applied Rock Mechanics (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Wellbore Formation Testing and Interpretaion (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Petrophysics of Unconventional Reservoirs (Page 11)</td>
</tr>
<tr>
<td></td>
<td>Integration of Flow, Log and Test Data (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Production Logging (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Capillarity in Rocks (Page 4)</td>
</tr>
<tr>
<td>Petrophysics</td>
<td>Reservoir Simulation Strategies (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Simulation (Page 5)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Modeling of Heavy Oil Resources (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Characterization and Management (Page 5)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Management (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Engineering for Unconventional Reservoirs (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Enhanced Oil Recovery (Page 3)</td>
</tr>
<tr>
<td></td>
<td>Production Operations 1 (Page 10)</td>
</tr>
<tr>
<td></td>
<td>Petroleum Risk and Decision Analysis (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Economics of Worldwide Petroleum Production (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Production Technology for Other Disciplines (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Team Leadership (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Applied Environmental Management Systems (Page 16)</td>
</tr>
<tr>
<td></td>
<td>Health, Safety, Environment (Page 16)</td>
</tr>
<tr>
<td>Petroleum Engineering</td>
<td>Petrophysics</td>
</tr>
<tr>
<td></td>
<td>Reservoir Characterization and Well Testing</td>
</tr>
<tr>
<td></td>
<td>Reservoir Management, Surveillance, Simulation</td>
</tr>
<tr>
<td></td>
<td>Development, Drilling, Completions, and Workovers</td>
</tr>
<tr>
<td></td>
<td>Enhanced Oil Recovery Fundamentals (Page 3)</td>
</tr>
<tr>
<td></td>
<td>Enhanced Basic Petroleum Economics (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Economics of Worldwide Petroleum Production (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Petroleum Risk and Decision Analysis (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Team Leadership (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Applied Environmental Management Systems (Page 16)</td>
</tr>
<tr>
<td></td>
<td>Health, Safety, Environment (Page 16)</td>
</tr>
<tr>
<td></td>
<td>Wellbore Formation Testing and Interpretaion (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Petrophysics of Unconventional Reservoirs (Page 11)</td>
</tr>
<tr>
<td></td>
<td>Integration of Flow, Log and Test Data (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Production Logging (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Capillarity in Rocks (Page 4)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Simulation Strategies (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Simulation (Page 5)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Modeling of Heavy Oil Resources (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Characterization and Management (Page 5)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Management (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Reservoir Engineering for Unconventional Reservoirs (Page 6)</td>
</tr>
<tr>
<td></td>
<td>Enhanced Oil Recovery (Page 3)</td>
</tr>
<tr>
<td></td>
<td>Production Operations 1 (Page 10)</td>
</tr>
<tr>
<td></td>
<td>Petroleum Risk and Decision Analysis (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Economics of Worldwide Petroleum Production (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Production Technology for Other Disciplines (Page 12)</td>
</tr>
<tr>
<td></td>
<td>Team Leadership (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Applied Environmental Management Systems (Page 16)</td>
</tr>
<tr>
<td></td>
<td>Health, Safety, Environment (Page 16)</td>
</tr>
<tr>
<td>Petroleum Business &amp; Professional Development</td>
<td>Enhanced Oil Recovery Fundamentals (Page 3)</td>
</tr>
<tr>
<td></td>
<td>Economics of Worldwide Petroleum Production (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Petroleum Risk and Decision Analysis (Page 14)</td>
</tr>
<tr>
<td></td>
<td>Team Leadership (Page 15)</td>
</tr>
<tr>
<td></td>
<td>Applied Environmental Management Systems (Page 16)</td>
</tr>
<tr>
<td></td>
<td>Health, Safety, Environment (Page 16)</td>
</tr>
</tbody>
</table>

All classes available at your location. Contact us today.
Basic Reservoir Engineering – BR

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

Applied Reservoir Engineering – RE

FOUNDATION 10-Day

This course represents the core of our reservoir engineering program and the foundation for all future studies in this subject. Numerous engineering practices are covered, ranging from fluid and rock properties to simulation and field development planning. Proficiency in using Microsoft Excel to perform calculations and make graphs is desirable. Reservoir engineering is also presented in the context of a modern, multi-disciplinary team effort using supporting computer technology. An extensive manual and set of references are included. Are you ready to attend a PetroSkills Applied Reservoir Engineering course training class, school or short course? This is the best time to register.

DESIGNED FOR

Engineers or geoscientists who will occupy the position of reservoir engineer, and any other technically trained individual who desires a more in-depth foundation in reservoir engineering than is offered in the one-week Basic Reservoir Engineering and Reservoir Engineering for Other Disciplines courses.

YOU WILL LEARN HOW TO

- Determine critical properties of reservoir rocks fluid (oil, water, and gas) PVT relationships
- Calculate hydrocarbons initially in place using several methods
- Assess reservoir performance with dynamic techniques
- Determine the parameters that impact well/reservoir performance over time
- Analyze well tests using standard well testing principles and techniques
- Characterize aquifers
- Determine reservoir drive mechanisms for both oil and gas reservoirs
- Apply oil and gas field development planning principles
- Forecast production decline

COURSE CONTENT

Asset life cycles, professional roles, hydrocarbon reservoir descriptions • Porosity, permeability, compressibility, capillary pressure, wettability and relative permeability, averaging reservoir property data • Phase behavior of reservoir fluids, gas properties, oil properties, water properties, PVT sampling, and understanding PVT laboratory reports • Calculate original hydrocarbons inplace with volumetric methods, build hydrocarbon volume vs depth relationships, and review reserve booking guidelines • Oil recovery material balance, Havlena-Odell method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs • Oil well testing: radial flow theory, wellbore storage and skin, drawdowns, buildups, curve shapes, type curve solutions, pseudo steady state, steady state, average pressure estimates, PI and IPR relationships • Gas well testing: pressure, pressure squared, real gas pseudo pressure solutions, rate sensitive skins, multi-rate testing, gas well deliverability • Hurst van Everdingen, Carter Tracy, and Fetkovitch methods of aquifer analysis and description • Immiscible displacement: fluid displacement process, fractional flow, Buckley Leverett, Welfe Description of coring, cusping, and over/under running, critical rates calculations, breakthrough times, horizontal well applications • Gas reservoirs: volumetric, water drive and compaction drive, oil reservoirs: water drive, water flood, gravity drainage, gas cap expansion, combination drive, naturally fractured and critical reservoir fluid reservoirs • Gas field developments: characteristics, deliverability issues, contracts, planning tools - oil field developments: development phases, reservoir characterization, sweep and recovery, production policies • Reservoir simulation: how simulate? Various simulation models, simulator types, setting up a simulator model

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDINE, UK</td>
<td>1-12 Apr 2019</td>
<td>$8910+VAT</td>
</tr>
<tr>
<td>ABU DHABI, UAE</td>
<td>18-28 Aug 2019</td>
<td>$9530+VAT</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>15-26 Oct 2018</td>
<td>$7360+GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>5-16 Nov 2018</td>
<td>$7445</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>7-18 Dec 2018</td>
<td>$9135</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3-4 Dec 2018</td>
<td>$8500+VAT</td>
</tr>
<tr>
<td>MIDLAND, US</td>
<td>10-21 Sept 2018</td>
<td>$7360</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>2-13 Dec 2018</td>
<td>$7475</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDINE, UK</td>
<td>3-7 Dec 2018</td>
<td>$4790+VAT</td>
</tr>
<tr>
<td>ABU DHABI, UAE</td>
<td>6-10 Oct 2019</td>
<td>$3350+VAT</td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>19-23 Aug 2019</td>
<td>$4170</td>
</tr>
<tr>
<td>BENEDEN, US</td>
<td>29 Apr-3 May 2019</td>
<td>$4220</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>26-30 Nov 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>8-12 Oct 2018</td>
<td>$4970</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>20-24 Mar 2019</td>
<td>$4935+VAT</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDINE, UK</td>
<td>11 Mar-9 Aug 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3 Jun-8 Nov 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3 Sep-7 Feb 2020</td>
<td>$7570</td>
</tr>
</tbody>
</table>

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

TO LEARN MORE, VISIT
PETROSKILLS.COM/BR-BLENDED

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

PETROSKILLS.COM/RE-BLENDED

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDINE, UK</td>
<td>3-7 Dec 2018</td>
<td>$4790+VAT</td>
</tr>
<tr>
<td>ABU DHABI, UAE</td>
<td>6-10 Oct 2019</td>
<td>$3350+VAT</td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>19-23 Aug 2019</td>
<td>$4170</td>
</tr>
<tr>
<td>BENEDEN, US</td>
<td>29 Apr-3 May 2019</td>
<td>$4220</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>26-30 Nov 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>8-12 Oct 2018</td>
<td>$4970</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>20-24 Mar 2019</td>
<td>$4935+VAT</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDINE, UK</td>
<td>11 Mar-9 Aug 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3 Jun-8 Nov 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>3 Sep-7 Feb 2020</td>
<td>$7570</td>
</tr>
</tbody>
</table>
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 persons who are already well trained in the other upstream petroleum industry technical disciplines with an understanding of the current state-of-the-art practice of reservoir engineering.

**DESIGNED 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

**COURSE 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, reservoir booking practices, and reservoir recovery efficiencies
- Material-Balance Methods: oil reservoir material balance, Haverland-Dohm method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs
- Fluid flow and well performance: radial and linear flow, transients, pseudosteady state, steady state flow regimes, productivity of vertical and horizontal wells
- Aquifer influx and Irremiscible Displacement: fluid displacement process, fractional flow, Buckley-Leverett, water, water under running, and gas overriding
- Coning and Cusping: 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, gas flood, gas cap expansion, combination drive, naturally fractured and critical reservoir fluid flow
- Reservoir Simulation: 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

### 2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>26-30 Nov 2018</td>
<td><strong>£4900</strong>+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>24-28 Nov 2019</td>
<td><strong>£5035</strong>+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>8-12 JULY 2019</td>
<td><strong>£4250</strong></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>29 OCT-2 NOV 2018</td>
<td><strong>£4250</strong></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>29 OCT-2 NOV 2019</td>
<td><strong>£4250</strong></td>
</tr>
<tr>
<td>KUALA LUMPUR, MY</td>
<td>12-16 NOV 2018</td>
<td><strong>£5070</strong></td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>7-11 OCT 2019</td>
<td><strong>£4270</strong></td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>9-13 DEC 2019</td>
<td><strong>£4250</strong></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29 OCT-2 NOV 2018</td>
<td><strong>£4400</strong></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>9-13 DEC 2019</td>
<td><strong>£4255</strong></td>
</tr>
</tbody>
</table>

Well Test Design and Analysis — WTA

**FOUNDATION** 5-Day

This course stresses practical application of well test theory to design and interpret pressure transient tests. An integrated approach to well test interpretation is emphasized throughout the course. Class exercises involving hand calculations and simple spreadsheet applications will reinforce the concepts illustrated by both synthetic data sets and real field examples. Participants will be able to apply the knowledge and skills they gain in this course to their job assignments upon course completion.

**DESIGNED FOR**

Engineers and geoscientists who want to understand well testing principles and interpretation techniques to design, analyze, report, evaluate results or intelligently participate in the well testing process. Previous experience in production and/or reservoir engineering is recommended. Previous experience in well testing is helpful but is not required.

**YOU WILL LEARN HOW TO**

- Analyze drawdown and buildup tests in oil and gas wells
- Identify flow regimes using the log-log diagnostic plot
- Describe characteristic pressure behavior for common bounded reservoir geometries
- Identify well test data affected by various wellbore and near-wellbore phenomena
- Design a well test to meet desired objectives
- Estimate average drainage area pressure
- Analyze well tests in hydraulically fractured wells, horizontal wells, and naturally fractured reservoirs

**COURSE CONTENT**

Introduction to well testing • Radial flow • Log-log type curve analysis • Pressure transient testing for gas wells • Flow regimes and the log-log diagnostic plot • Bounded reservoir behavior • Wellbore and near-wellbore phenomena • Well test interpretation • Well test design • Estimation of average drainage area pressure • Radial flow • Log-log diagnostic plot • hydraulically fractured wells• Horizontal wells• Naturally fractured reservoirs

### 2018-19 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>8-12 OCT 2018</td>
<td><strong>£4265</strong></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>7-11 OCT 2019</td>
<td><strong>£4265</strong></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>9-13 DEC 2019</td>
<td><strong>£5035</strong>+VAT</td>
</tr>
</tbody>
</table>

Enhanced Oil Recovery Fundamentals — ORE

**FOUNDATION** 5-Day

One-third to one-half of the original oil-in-place may remain in a reservoir as it reaches abandonment due to its economic limit. This course covers the recovery improvement process that prevents themselves at all stages in the reservoir life cycle. It thereby enables one to timely select the most beneficial method and set realistic expectations on the behavior change and recovery improvement. The impacts of the selected method on personnel training, technology transfer, and facility modification are also covered. It utilizes case studies from projects around the world, their analyses and interpretations aid the participant in understanding of the material.

**DESIGNED FOR**

Engineers responsible for sustaining or increasing oil and gas production and enhancing oil recovery from reservoirs under primary depletion, pressure maintenance by water or gas injection, and enhanced oil recovery schemes. Also, other professionals and managers participating in the above effort on a multi-disciplinary team who need to gain better understanding of various conventional and emerging technologies.

**YOU WILL LEARN HOW TO**

- Develop recovery expectations from reservoirs under primary depletion or pressure maintenance utilizing water or immiscible gas injection
- Determine reasons and causes for less than theoretically possible recovery
- Choose appropriate methods for improving oil recovery from reservoirs under primary depletion or pressure maintenance utilizing water or immiscible gas injection
- Enhance oil recovery beyond waterflooding or immiscible gas injection project
- Understand mechanisms responsible for recovery improvement in various EOR methods
- Important variables that control recovery improvement in various EOR methods
- Select EOR methods using screening criteria
- Use designing procedures - theoretical, laboratory tests, and field pilots
- Plan and implement EOR processes employing the proper empirical, analytical, and simulation tools
- Forecast rate-time and recovery-time behavior under various EOR methods and analyze reservoir performance
- Assess risks and ways to minimize their impact on project economics
- Monitor reservoir/well behavior

**COURSE CONTENT**

Reservoir life cycle and recovery process • Life under primary recovery phase: recovery targets and ways to improve • Life under secondary recovery phases: immiscible gas injection, waterflooding, recovery targets, ways to improve • Life under enhanced oil recovery phase: increasing complexity, cost/benefit consideration • Miscible methods • Chemical methods • Thermal methods • Technical challenges current and future R&D directions, facilities modifications and personnel training

### 2018-19 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>7-11 OCT 2018</td>
<td><strong>£4270</strong></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>29 OCT-2 NOV 2018</td>
<td><strong>£4400</strong></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 AUG 2019</td>
<td><strong>£5035</strong>+VAT</td>
</tr>
</tbody>
</table>

Chemical Enhanced Oil Recovery Fundamentals — EORC

**SPECIALIZED** 5-Day

This course gives an overview of oil recovery processes that involve the use of polymer, surfactant, alkali, gel, and a combination of them. Furthermore, it reviews reservoir engineering fundamentals and describes the principles for a variety of chemical enhanced oil recovery processes. The current status of these technologies is discussed and guidelines are presented for initial screening for each process corresponding to particular field conditions. Examples of laboratory and field performances are presented. Simulation exercises are used for each process.

**DESIGNED FOR**

Engineers, geoscientists, management personnel or other technical personnel with at least a B.S. degree and some experience in reservoir engineering. The course benefits individuals who are responsible for the design, implementation and management of chemical EOR projects. However, the contents of this course are also beneficial for other technical personnel involved in risk analysis, simulation studies, screening, and planning of EOR applications. This course may interest new recruits as well as experienced professionals who want to gain a better understanding of the concepts, practices, benefits, and limitations of chemical EOR methods.

**YOU WILL LEARN HOW TO**

- Evaluate benefits and limitations of different chemical EOR processes
- Select laboratory tests and performing scoping simulations for pilot and field designs
- Screen these techniques for particular fields
- Set expectations on incremental oil recoveries and the economics
- Determine impact of these recovery techniques on production facilities and personnel training

**COURSE CONTENT**

Review of areal and vertical sweep efficiencies • Heterogeneity and vertical sweep efficiency • Residual oil saturation • Enhanced Oil Recovery (EOR) methods: Chemical EOR methods • Polymer flooding - polymers and their properties • Laboratory screening • Polymer fluid field design and example Field results • Overview of reservoir simulators for polymer flooding • Example simulations • Surfactant/polymer (SP) methods • Surfactant-brine-oil phase behavior • Microemulsion properties • Capillary desaturation and oil mobilization • Laboratory screening • Field examples and designs • Reservoir simulators for SP - Example simulations • Alkaline/Surfactant/Polymer (ASP) methods • Effect of alkali on phase behavior • Laboratory screening • Field examples and designs • Reservoir simulators for ASP - Example simulations • Performance Control/ Water Shutoff Methods • Overview of conformance control options (i.e. bulk gel, CDG, PRG, Bright Water) • Gel properties • Laboratory screening • Field examples and designs • Reservoir simulators for conformance control methods

### 2018-19 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>29 OCT-2 NOV 2018</td>
<td><strong>£4400</strong></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>9-13 JUL 2019</td>
<td><strong>£4525</strong></td>
</tr>
</tbody>
</table>

*plus computer charge*
Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies – RFP

**FOUNDATION**

This course goes beyond the usual description of reservoir fluid properties. The underlying purpose is to be able to prepare the most accurate possible set of values of fluid properties for use in engineering calculations. An understanding of the advantages of the application of both laboratory data and correlations will be provided. Extensive exercises are used to illustrate the principles and to test the consistency of measured data. Accordingly, participants are encouraged to bring their own PVT laboratory data to deconstruct in class. Equations of State calculations are introduced, and a tuning exercise is conducted on commercial software.

**DESIGNED FOR**

Reservoir, production, and facilities engineers who have a need to model the flow of oil, gas, and water through reservoirs, wellsites, and facilities.

**YOU WILL LEARN HOW TO**

- Identify the type of fluid in a particular reservoir and predict how that fluid will behave during production
- Read and interpret PVT Reports
- Use laboratory data to determine values of fluid properties for use in engineering calculations, including Equation of State
- Use correlations to determine values of fluid properties in the absence of laboratory data
- Select the best available fluid property correlations for oils, gases, and brines
- Shape PVT data to get the best results out of analytical and numerical software

**COURSE CONTENT**

- Fluid fundamentals • Dry gas models • Brine models • Wet gas models • Dead oil models
- Black oil models • Volatile oil models • Gas condensate models • Fluid sampling • Laboratory tests • Reading a PVT report
- Quality checks on a PVT report • Corrections to laboratory data • Equations of State • Tuning Equations of State

Waterflooding A to Z – WF

**FOUNDATION**

Waterflooding has long been proven as the simplest and the lowest cost approach to maintaining production and increasing oil recovery from an oil reservoir. However, these benefits may fall far short of the expectations unless the time-tested concepts and practices are clearly understood and judiciously implemented. These concepts and practices aim at process optimization – reducing production costs while minimizing waste and maximizing oil recovery and income. This course is light on theory but heavy on proven and successful practices. Published case histories of projects around the world are reviewed to provide an understanding of divergent points-of-view, what works where, what fails when, and why. This training covers all elements of a waterflood project from A to Z - from source water selection to produced water disposal and everything in between. Participants are grouped into small multi-disciplinary teams. All classroom discussions and problem-solving sessions are handled in an asset management team format. Simulation studies are done in class to evaluate basic waterflooding physics as well as to optimize the development of a hypothetical field.

**DESIGNED FOR**

Reservoir, production, facilities, and operations engineers who are involved with some aspects of a new or existing waterflood project; geoscientists and professionals who want to get a better feel for the entire process of planning, development, management, and optimization of a waterflood project.

**YOU WILL LEARN HOW TO**

- Distinguish rock characteristics and fluid properties that control displacement of oil and thereby control oil recovery
- Predict incremental oil recovery and develop production and injection profiles using a variety of tools
- Estimate injection water requirements in terms of volumes, timing, and composition
- Create early warning systems for flood management and optimize oil recovery through new and existing technologies
- Specify components of a well-designed waterflood plan

**COURSE CONTENT**

- Overview and terminology • Effect of rock properties • Effect of heterogeneity and anisotropy • Effect of fluid properties
- Wettability • Capillary pressure • Relative permeability • Physics of water and oil displacement
- Statistical forecasting • Analytical forecasting • Numerical forecasting • Injector monitoring • Producer monitoring • Integrated monitoring
- Effect of water impurities • Surface processing of injection and produced water • Water shut-off • Pattern rotation • Natural and hydraulic fracturing • Horizontal well applications
- Downhole separation • Enhanced waterfloods • Waterflooding planning • Many case histories

Enhanced Oil Recovery with Gas Injection – EORG

**SPECIALIZED 5-Day**

This course gives a comprehensive understanding of immiscible gas and compositionally enhanced recovery processes and the important variables that influence the gas flooding process. The course contains both theoretical and practical material so that an engineer can apply learned knowledge to his/her unique reservoir. The course discusses process optimization to reduce production costs while maximizing oil recovery and income. Compositional simulation using equations-of-state are used to demonstrate how to optimize gas design parameters for water-alternating-gas floods. Published case histories from around the world are reviewed to provide an understanding of what works where, what fails, and why. The course is supplemented with the SPE Fundamentals of Enhanced Oil Recovery textbook and the monograph on Practical Aspects of CO2 Flooding.

**DESIGNED FOR**

Petroleum engineers who want an in-depth knowledge of immiscible and miscible gas flooding techniques. The participant should have some basic knowledge of flow through porous media and should already understand water flooding fundamentals, including black-oil PVT behavior, Buckley-Leverett flow, and optimization of well placement based on reservoir characterization.

**YOU WILL LEARN HOW TO**

- Distinguish rock and fluid characteristics that influence gas flooding recovery
- Understand key factors and process fundamentals that affect volumetric sweep and displacement efficiency
- Estimate key parameters through problem assignments and spreadsheets
- Specify components of a well-designed gas flooding process
- Evaluate each field project based on physical principles and select the proper solvent and injection scheme
- Use compositional simulation to address basic recovery mechanisms and perform process optimization
- Identify problems, key parameters, and trends from field case studies

**COURSE CONTENT**

- Reservoir characterization and phase behavior • Flow regimes and sweeps • Immiscible gas/ water flood mechanisms • First contact miscibility mechanisms • Multi-contact miscibility mechanisms • Reservoir simulation, WAG design, and performance forecasting • Performance and monitoring of field projects

**Capillarity in Rocks – CIR**

**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 Thoresen, Leverett-J, and Brooks-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/water 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 representativeness • Capillary forces in reservoir rocks; their measurement • 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 • Relation between total and residual saturations • Interpretation of single and multiple pore system rocks • Clay-bound water • Capillary pressure vs. NMR • Seal capacity
### History Matching and Reservoir Optimization – HMRO

**INTERMEDIATE 5-Day**

This course is designed to cover state-of-the-art techniques/workflows for history matching, geologic and reservoir models for both conventional and unconventional reservoirs. The course will discuss manual and assisted history matching methods and also, inverse modeling techniques and the pros and cons of the methods. The production/history data can be in the form of pressure or rate transient tests, tracer tests, multiphase production history, or interpreted 4D seismic information. Field examples will be presented to illustrate the current state of the art and limitations. The use of history matched models for optimizing reservoir development and management strategies will be discussed. The course will involve a combination of theoretical discussion, practical applications, and computer exercises using public domain software to provide the participants with hands-on training on the workflows that can be applied using available commercial software.

**DESIGNED FOR**

Practicing geoscientists and engineers performing geologic modeling, reservoir simulation, and optimization studies.

**YOU WILL LEARN HOW TO**

- Recognize the difficulties and sources of error in history matching
- Define limitations of various techniques for both conventional and unconventional reservoirs
- Apply theory of streamlines and streamline-assisted history matching for waterflooding
- Understand the background and theory of commercially available assisted/automatic history matching tools and algorithms
- Apply concepts of experimental design/response surface/surrogate models
- Use learnings from case studies for a systematic procedure for history matching and well placement optimization in a mature field, well rate optimization/valoration in a mature field, and well completion optimization for an unconventional reservoir
- Use permeability predictions, facies identification, and upscaling
- Use commercial tools for history matching

**COURSE CONTENT**

**History Matching** fundamentals and workflow • Simulation equations • Reservoir Simulation: background • History Matching: mathematical background • Drainage volume calculations and completion optimization • History matching of unconventional reservoirs • Practical considerations • Streamline-based history matching • Streamline Simulation • Streamlines: mathematical background • Streamlines: applications • Streamline-based history matching • History matching and uncertainty analysis • Experimental design and surrogate models • Multiscale history matching with grid coarsening • Case Study: history matching and rate optimization • Case Study: history matching and well placement optimization • History Matching: new developments

---

### Integrated Reservoir Modeling – GRD

**INTERMEDIATE 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

---

### Oil and Gas Reserves Evaluation – OGR

**INTERMEDIATE 5-Day**

Key objectives of this course are to learn various compliant methods of preparing reserves estimates, learn to estimate and understand the impact of economics on those estimates, and properly classify those reserves using the current reserves definitions. Recent case studies, SEC audit questions, and class problems are used extensively to develop an understanding of those skills and include ethical issues that arise when calculating and reporting reserves.

**DESIGNED FOR**

Geologists, geophysicists, reservoir engineers, reserves managers, bankers, and government officials involved in reserves reporting, reserves auditing, and reserves estimations.

**YOU WILL LEARN HOW TO**

- Correctly interpret and apply the SPE-PRMS reserves definitions and principles
- Interpret and apply the SEC Modernization of Oil and Gas Reporting definitions and Guidelines
- Generate compliant reserves estimates and reports using either set of definitions
- Understand and use various traditional engineering and geoscience techniques to satisfy reserves reporting requirements
- Incorporate modern, reliable technology into your reserves estimates
- Document your reserves estimations
- Prepare for an SEC, third party, or bank audit of your work
- Successfully defend your estimates during an audit
- Conduct a thorough audit of another party’s reserves report

**COURSE CONTENT**

Purpose and uses of reserves estimates • Types of reserves studies • How to read and understand a reserves report • SPE-PRMS reserves definitions • SEC reserves definitions • Compliant reserves estimation methods using: analogues, volumetric analysis, performance analysis, and material balance • Supplemental compliant estimation techniques including: probabilistic analysis and simulation techniques, Economics and reserves • Special reserves estimation tips - reserves reporting in low permeability reservoirs, shale gas reservoirs, CBM, and EOR projects

---

### Reservoir Characterization: A Multi-Disciplinary Team Approach – RC

**INTERMEDIATE 5-Day**

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

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

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

---

**2018-19 Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>5-9 Nov 2018</td>
<td>$4415</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>5-9 Aug 2019</td>
<td>$5135+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>10-14 Dec 2018</td>
<td>$4340</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>13-17 May 2019</td>
<td>$5135+VAT</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)
Reservoir Management

INTERMEDIATE 5-Day

The principles of sound reservoir management are presented with emphasis on practical applications. Actual case histories are used to study both successes and failures. An interdisciplinary, synergistic approach to efficient reservoir management is detailed with the goal of optimized profitability. The significance of each component and the importance of timing and cost/benefit analysis are emphasized. Reservoir management models for optimum field development and field operating plans are analyzed. The interdisciplinary reservoir management approach shows how each technology or function contributes to the plan and how checks and balances are developed.

DESIGNED FOR
Reservoir, production, and operations engineers, geologists, geophysicists, managers, experienced technicians, and service company personnel responsible for improving the performance of petroleum reservoirs.

YOU WILL LEARN HOW TO
• Apply the principles of sound reservoir management
• Use the interdisciplinary synergistic approach to efficient reservoir management
• Include each reservoir management component and the importance of timing and cost/benefit analysis
• Develop checks and balances

COURSE CONTENT
Definition of reservoir management: an integrated, interdisciplinary team effort • Goal setting, planning, implementing, monitoring, and evaluating reservoir performance • Field development and field operating plans to optimize profitability • Efficient monitoring of reservoir performance • Minimalizing drilling of unnecessary wells • Wellness and surface systems • Well testing and automated production systems • Economic impact of operating plans • Identifying and acquiring critical data, data acquisition, and analysis • Maximizing economic recovery and minimizing capital investment, risk, and operating expenses • Timing of field implementation of reservoir management plans • Case histories and analysis • Importance of reservoir characterization and drilling and operating plans • Primary recovery, pressure maintenance, and secondary and tertiary recovery • Responsibilities for team members

Reservoir Management for Unconventional Reservoirs – RMUR

INTERMEDIATE 5-Day

This course in unconventional reservoir management is aimed at all petro-technical professionals who have little experience with these resource types but who wish to quickly learn the key elements and issues associated with the exploitation of unconventional reservoirs (tight gas, light oil, and shales). The course is built around the role of the reservoir engineer and, hence, concerns itself with the integration and use of information to make well rate and recoverable volumes estimates, making decisions on desirable data collection, and planning answers to common questions such as choice of initial development spacing and the value of subsequent infill drilling. Attendees should leave this course with an improved understanding of unconventional reservoir exploitation.

DESIGNED FOR
All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types. The course is focused on reservoir management issues for tight gas, light oil and shale reservoirs. CBM reservoirs are not addressed.

YOU WILL LEARN HOW TO
• Plan solutions to common reservoir management problems for unconventional reservoirs
• Apply approaches to estimate rate and recoverable volumes for wells prior to development in an unconventional reservoir
• Use classical and current non-simulation methods for estimating well rates and recoverable volumes using production data from unconventional reservoirs
• Better understand the limitations of these rate and recoverable volume prediction methods
• Address the development of a life-of-field surveillance plan for an unconventional reservoir
• Better understand the use, design and analysis of pressure transient tests appropriate for the characterization of unconventional well/reservoir systems (DFTTs & PBUs)

COURSE CONTENT
Reservoir Management and the role of the reservoir engineer • Unconventional reservoirs: quality recognition and development life-stages • A review of the fundamentals of volumetric in unconventional reservoirs • Rate and recoverable volumes prediction: before development • Rate and recoverable volumes prediction: after development • Pressure transient testing: appropriate methods; design and analysis • Life-of-field surveillance planning • Solving common unconventional reservoir management problems: setting initial spacing • Solving common unconventional reservoir management problems: valuing and planning infill drilling • Solving common unconventional reservoir management problems: development drilling sequence • Reservoir simulation versus non-simulation tools • Uncertainty issues

Reservoir Modeling of Heavy Oil Resources – HORM

INTERMEDIATE 3-Day

As conventional oil reserves decline, more emphasis is placed on heavy oil and bitumen. Heavy oil and bitumen are plentiful in many developed oil provinces, as well as in areas with no conventional oil. As with conventional oil, the reservoir engineering aspects of the development of heavy oil and bitumen is aided by modeling of various kinds. For heavy oil and bitumen, the modeling is complicated by the high oil viscosity and the need for enhanced oil recovery techniques, usually involving heating of the reservoir to produce the oil at commercial rates. In this course, modeling is understood as a part of reservoir engineering and includes the use of analogues and analytical modeling, as well as numerical simulation. The emphasis is on numerical simulation, but analytical techniques are also examined in some detail, since they provide considerable insight into the recovery process. The emphasis of the course is on how to perform a successful heavy oil simulation study, including factors to be considered, pitfalls to avoid, testing of models, examination of output, and ensuring results are reliable.

DESIGNED FOR
Petroleum and reservoir engineers who will be actively working on studies, and be involved in assessing the results of studies.

YOU WILL LEARN HOW TO
• Select the type of modeling required to meet the aims of the study • Design different types of modeling studies to achieve the aims of the study (feasibility, operating strategy, development plan, ultimate recovery, etc.) • Collected and select the data for the study • Incorporate field observations into the study (production data, pressure data, 4D seismic, observation well data) • Set up, run, and test the model(s) • Assess the adequacy of the history match(es) • Create and run different development options and assess the results • Assess the results of third party studies (in-house or external)

COURSE CONTENT
Introduction (definitions of heavy oil, types of study, types of modeling, design of study, grid effects, binary screening) • Basic reservoir engineering and reservoir characterization (overview of reservoir engineering techniques and their limitations for heavy oil, types of geological models, introduction to geostatistical models) • Rock and fluid data for heavy oil (oil viscosity, thermal properties of reservoir, temperature dependence of relative permeability, etc.) • Non-thermal recovery of heavy oil (cold heavy oil production with sand, chemical flooding, VAPEX, immiscible gas flooding) • Thermal recovery using steam (cyclic steam stimulation, steamflood, steam-assisted gravity drainage) • Thermal recovery without steam (in-situ combustion, electrical heating, hot water flood, steam with additives)

Reservoir Simulation Strategies – RSS

INTERMEDIATE 5-Day

This course is designed to give an introduction to the fundamental and practical aspects of modern reservoir simulation. Particular emphasis is placed upon the available data and its integration into a data set that reflects a coherent model of the reservoir. These aspects are reinforced with small practical examples run by groups of the course participants. The course is organized in morning lecture sessions and afternoon practical sessions.

DESIGNED FOR
Reservoir and petroleum engineers who will be actively using reservoir simulation.

YOU WILL LEARN HOW TO
• Apply the principles of reservoir engineering to numerical modeling • Set up, run, and analyze the results for single-well, pattern, and full-field models • Prepare fluid and rock property data in the manner required for simulation studies • Identify and eliminate causes of numerical problems • Perform a history match • Use the matched model to predict future performance under a variety of assumptions

COURSE CONTENT
Buckley Lovett discretization • One dimensional water oil displacement • Model components, types, and modern gridding methods • Two dimensional displacement • Grid orientation and refinement • Routine and special core analysis • Single phase up-scaling of geo-cellular model parameters
**Decline Curve Analysis and Diagnostic Methods for Performance Forecasting** – DCA

**SPECIALIZED 2-Day**

Decline curve analysis has been called the most commonly used and misused technique for forecasting future production and remaining reserves. This course will give the learner a better understanding of how fundamental reservoir properties and drive mechanisms affect the shape of the production decline curve and how to avoid many of the mistakes commonly found in decline curve forecasts. The course also examines the use of modern production decline type-curve evaluations to evaluate reservoir properties and predict future performance.

**DESIGNED FOR**

Engineers or technical assistants who are responsible for making forecasts of future production using decline curves. Economists, managers, or geoscientists who are interested in developing a greater working knowledge of decline curve methods and how to make better forecasts will also benefit from this course.

**YOU WILL LEARN HOW TO**

- Use the exponential, hyperbolic, and harmonic decline curve equations
- See the relationships between reservoir recovery mechanisms and decline curve types
- Identify and understand how the transient flow period can lead to overestimation
- Use multiple methods to avoid overestimating reserves
- Recognize reservoir performance characteristics based on field examples
- See the impact of reservoir heterogeneities such as faulting, permeability variance, and layering
- Account for changing operating conditions
- Perform analysis on a multi-well basis without introducing common errors
- Use alternative methods including diagnostic performance plots (e.g., log WOR vs. Np, Stagg’s, P/2 vs. Gp, etc.) for rate and reserves analysis
- Use advanced decline curve and production data analysis for reservoir characterization

**COURSE CONTENT**

Conventional decline curve equations: exponential, hyperbolic and harmonic rate versus time and rate versus cumulative production relationships, selecting the proper equation based on reservoir properties and drive mechanisms

**The effects of transient production: how to recognize transient production, how transient forecasts can overestimate remaining reserves, how to properly constrain transient forecasts**

**Forecasting during displacement processes: using trends like water-oil ratio and versus cumulative oil production to estimate ultimate oil recovery, converting these trends into an oil rate versus time forecast**

**Difficult situations: layered and compartmented reservoirs, downtime, workovers, changing facility conditions and facility constraints, forecasting groups of wells, common mistakes**

**Production decline type-curves: introduction and historical background, how to use modern Fetkovich-type curves for forecasting production**

**Brief discussion of unconventional gas/oil reservoir decline analysis and production forecast

---

**Gas Reservoir Management** – GRM

**SPECIALIZED 5-Day**

Natural gas production has become a major part of every petroleum company’s asset base and continues to grow in importance throughout the world. This course will help participants understand the engineering drivers on gas reservoir management and how a gas reservoir’s value can be maximized through sound engineering practices. A full spectrum of gas reservoir engineering techniques is addressed and their application to a large variety of gas resource management options is discussed.

**DESIGNED FOR**

Engineers actively involved with the operation and management of gas reservoirs; geoscientists working with gas reservoirs in field development and expansion planning would also benefit from attending this course.

**COMMENTS FROM PREVIOUS PARTICIPANTS:**

“Very good practical approach to the material - course is highly recommended.”

“Instructor did a great job relating the theory to potential applications.”

“Exercises were practical and useful.”

**YOU WILL LEARN HOW TO**

- Evaluate gas reservoir data and prepare this data for engineering calculations
- Apply frequently used gas reservoir engineering techniques
- Perform production decline type curve analysis and use other advanced reservoir calculations such as simulation
- Solve reservoir engineering calculations through the use of many practical exercises

**COURSE CONTENT**

- Gas reservoir fluid properties: gas condensate sampling and understanding laboratory reports
- Gas reservoir fluid flow and well testing: deliverability testing and non-darcy flow, testing for hydrofractured wells, horizontal wells, and gas condensate reservoirs
- Determination of original gas-in-place: material balance techniques for various drive mechanisms and reservoir types, alternate plotting techniques, production decline type curves
- Gas flow in wells and pipelines: the gas production system, pressure drop in wells and flowlines, restrictions to gas production
- Prediction of future performance and ultimate recovery: decline curves, coupled material balance and deliverability techniques, reservoir simulation, gas well spacing and infill drilling
- Special topics: Reservoir management of water-drive gas reservoirs, predicting gas condensate reservoir performance, coupled methane reservoirs

---

**Horizontal and Multilateral Wells: Analysis and Design** – HML1

**SPECIALIZED 5-Day**

The complex, interdisciplinary decisions in advanced well projects are emphasized in this course. The application and benefits of horizontal and multilateral wells are analyzed. The process of candidate screening and selection, involving geological, reservoir, and production characteristics are considered, as well as constraints on drilling and completion options. Methods to predict well performance and recovery from horizontal and multilateral wells are presented with integration of inflow and wellbore flow performance for individual and multilateral wells. Well completion options and its impact on well performance for horizontal and multilateral wells are summarized. The improvement by well stimulation (multistage hydraulic fracturing and matrix acidizing) is evaluated. Economic and risk analysis are also presented with a number of case histories to highlight the performance and benefits of horizontal wells and the elements of risk and uncertainty at the initial design stage.

**DESIGNED FOR**

Geologists, reservoir engineers, production and completion engineers, and development, asset, and project managers.

**YOU WILL LEARN HOW TO**

- Identify the applications of horizontal, multilateral, and intelligent wells from geological and reservoir aspects
- Assess multidisciplinary inputs for successful development planning
- Predict horizontal and multilateral well productivity with integrated reservoir flow and well flow models
- Evaluate formation damage and well completion effects on advanced well performances
- Diagnose problems in advanced wells and conduct the necessary sensitivity analyses
- Evaluate well stimulation treatments, including multiple-stage fractured horizontal well performance and matrix acidizing results
- Intelligent well concept, design and field applications
- Minimize technical and economic risk in advanced well projects

**COURSE CONTENT**

- Technical and economic benefits of advanced well systems
- Reservoir applications for various well types
- The screening of applications for advanced well applications
- Geological structure characteristics
- Classification of advanced wells
- Reservoir inflow performance at different boundary conditions
- Wellbores flow and integrated well performance
- Commingled production and cross flow in multilateral wells
- Formation damage in horizontal and multilateral wells
- Well completion and combined effect of completion and damage on well performance
- Well stimulation evaluation by productivity improvement
- Optimal design of stimulation
- Reservoir simulation considerations
- Applications of intelligent completion in advanced wells
- Risk identification and assessment

---

**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 fracturing 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-fluid
- Behavior and stimulation of naturally-fractured reservoirs
- Effects of natural fractures on reservoir permeability, anisotropy, drainage area, and waterflood sweep efficiency

---

**2018-19 Schedule and Tuition (USD)**

**HOUSTON, US**

- **24-28 JUNE 2019**
  - **$4925**
  - **$5285+VAT**
  - **$5560+GST**
- **15-19 JULY 2019**
  - **$5420**
  - **$5687+VAT**
- **24-28 SEPT 2019**
  - **$5500+VAT**
  - **$5725+VAT**
- **25-29 MAR 2019**
  - **$5440+GST**

**LONDON, UK**

- **14-18 OCT 2019**
  - **$4525**
- **15-19 JULY 2019**
  - **$5235+VAT**

---

**Bakerfield, US**

- **5-6 NOV 2018**
  - **$2575**
- **6-7 MAR 2019**
  - **$2640**
- **10-11 JUNE 2019**
  - **$2675**
- **22-23 JULY 2019**
  - **$2640**

---

See website for dates and locations.
New Opportunities in Old Fields — NOF

SPECIALIZED 5-Day

Don’t buy or sell a producing property before taking this course! There is nearly always upsides in mature oil and gas fields that may be particularly profitable because of existing wells and infrastructure. The keys to successful exploitation of new opportunities include 1) recognition of the new opportunities, 2) quantification of the reserves, 3) evaluation of alternative methods of exploitation, and 4) economic analysis of depletion scenarios. Case studies and class problems address each of these key items and illustrate how new opportunities can be recognized and evaluated for many different types of oil and gas reservoirs.

The computer-based problems will provide the delegate with utility programs and solution templates that can be used in the real world.

DESIGNED FOR Reservoir and production engineers, development geoscientists, asset team leaders, acquisition and divestiture managers, and other technical personnel involved in evaluation and exploitation of reserves in mature fields.

YOU WILL LEARN HOW TO
• Recognize production and reservoir characteristics of old fields that indicate the potential for increasing reserves and value
• Understand whether existing recovery factors are consistent with those than can be realized with effective utilization of the natural drive mechanism(s) and the appropriate use of improved recovery methods
• Identify under-producing wells or field areas and recommend appropriate intervention
• Determine the upside potential of a field, distinguishing between incremental reserves and reserve acceleration
• Examine alternative re-development strategies by studying case histories and working example industry problems

COURSE CONTENT
Why Opportunities Emerge: nature of reserves growth; operating practices and their effect on new opportunities; the contribution of evolving technology
• Recognizing Opportunities: reservoir characteristics and production performance indicative of new opportunities, unraveling limited data, linking operator practices to new opportunities
• Reserves versus Upside Potential: review of reserve classification, risk assessment, value of new information, data quality control and integration
• Reservoir Heterogeneity and New Opportunities: categories of heterogeneity and their implications for new opportunities, reservoir compartmentalization, application of 3D seismic in old fields, identification of net pay, fractured reservoirs
• Exploitation Opportunities: reservoir enhancement through fluid injection, redevelopment of mature waterfloods, infill drilling, its utility, application, and value
• Horizontal and multilateral wells including their use in displacement projects, re-completions in stratified reservoirs, de-bottlenecking gathering systems, produced water management, co-production of water for improved recovery

2018-19 Schedule and Tuition (USD)

BAYKERSFIELD, US 1-5 APR 2019 $4470
DUBAI, UAE 17-21 NOV 2019 $5645+VAT
HOUSTON, US 22-26 OCT 2018 $4480
21-25 OCT 2019 $4525
LONDON, UK 17-21 JUNE 2019 $5235+VAT

*plus computer charge

See website for dates and locations.

Streamlines: Applications to Reservoir Simulation, Characterization and Management – SRS

SPECIALIZED 5-Day

This course is designed to cover introductory and advanced concepts in streamline technology and its applications for reservoir characterization, reservoir management/optimization and field development strategy. This course is not limited to streamline simulation but explores the power of streamlines in general. A copy of the SPE textbook Streamline Simulation: Theory and Practice along with streamline simulation software will be provided to each course participant.

DESIGNED FOR Practicing geoscientists and engineers. No formal training in reservoir simulation is required other than knowledge of basic mathematics.

YOU WILL LEARN HOW TO
• Apply the fundamentals of streamlines and streamline simulation, and analyze the advantages and limitations over conventional simulation tools
• Simulate flow and visualize results at the geologic model scale
• Calculate swept areas and drainage volumes
• Optimize drainage volumes
• Perform reservoir surveillance and flow optimization using streamlines
• Integrate streamlines with finite-difference simulators
• Validate upscaled and upgrided geologic models
• Perform streamline assisted history matching of reservoir models
• Apply streamline simulation for complex reservoir geometries and flow processes

COURSE CONTENT
Basic governing equations • Line source and sink solutions • Streamfunctions and streamtubes • Tracing streamlines in 3D • The streamline time of flight and its significance • Use of streamlines with finite-difference models • Streamline simulation • Flow simulation through geologic models • Streamline vs. finite difference • Analytical/numerical solutions along streamlines • Modeling gravity and cross-streamline mechanisms • Compressibility effects • Mapping and material balance errors • Practical considerations and limitations • Flow visualization • Primary recovery and drainage volume calculations • Swath volume calculations and optimizing infill wells pattern balancing/rate allocations • Improved waterflood management • Waterflood field tracer interpretation • Hybrid methods • Miscible flood modeling and predictions • Model rank and uncertainty assessment • Reservoir characterization upscaling/upsurging • Streamline-based history matching • History matching: workflows • Assisted history matching of finite-difference models • Streamline-based sensitivity computations production • Data integration • Field case studies • Advanced topics discussion and wrap-up • Fractured reservoir modeling and applications • Corner point geometry and faults • Compositional modeling • Time step and stability considerations • Front tracking methods • Streamline vs. finite difference: advantages and limitations

Unconventional Resource and Reserve Evaluation – URRE

SPECIALIZED 5-Day

This five-day advanced course is designed to expose attendees to the understanding and application of the latest approaches, techniques, and requirements being applied to reserves evaluation within unconventional resources. Particular focus is given to actions and methodologies that are necessary to enhance the reserve categorization. Discussion and class examples will emphasize the testing protocols necessary within the exploration, appraisal, and development phases of the reserve life cycle. The course is based around the Petroleum Reserve Management System (PRMS). Variations needed to conform to other national standards such as the SEC, NI-51, SORP, NPD, Chinese, as well as other standards, is taught as a stand-alone module. A majority of the offering is focused on shale oil and shale gas resources, with selected coverage of tight gas, coalbed methane, and coal seam gas plays also being included, depending on participant interest.

DESIGNED FOR Reservoir engineers and geoscientists working in integrated teams in unconventional assessments. Managerial staff requiring an understanding of unconventional reserve reserve and resource evaluation standards will also benefit.

YOU WILL LEARN HOW TO
• Differentiate reserve estimation approaches within shale oil/gas, tight gas, CBM/CSG, and hybrid plays
• Compute gas/oil in place and estimated ultimate recovery in unconventional resources
• Design a data collection program appropriate within the exploration, appraisal and development phases of an asset life cycle
• Apply analysis of core analysis, well test data, and proximate analyses to enhance reserve estimation
• Describe the advantages and disadvantages between various reserve estimating techniques including decline curve, rate transient, and the probabilistic approach
• Differentiate between various reserve and resource accounting methods
• Differentiate between prospective resources, contingent resources and reserves
• Summarize the concepts of “reasonable certainty” and “reliable technology”
• Create a unconventional reserve growth portfolio
• Minimize unconventional reserve write-downs

COURSE CONTENT
Fundamentals of unconventional reserves • The Petroleum Reserve Management System (PRMS) • Probabilistic analysis as applied to unconventional resources • Exploration data collection programs • Prospective resource evaluation • Appraisal data collection programs • Contingent resource evaluation • Multiple data collection programs • Reserve evaluations • Reserve portfolio management • Alternating evaluation approaches • Ethics and public information releases

We Can Help! ePetro Online Learning for Petroleum Professionals

Ideal for both technical and business-oriented professionals, this online e-learning series incorporates topics across the value chain including:

Modern Oil & Gas Industry
E&P Asset Life Cycle
Reservoirs
Petroleum Geology
Exploration and Appraisal
Drilling Operations and Systems
Well Completion / Stimulation
Production Technology
Hydrocarbon Recovery
Surface Processing
Midstream Overview
Pipelines and Storage Systems
Gas Processing Overview
Refining Fundamentals
Introduction to Petrochemicals
Steam Cracking
Introduction to Solvents

Visit petroskills.com/elearning or email us at solutions@petroskills.com

All classes available at your location. Contact us today.
+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
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
This course is foundational it will be of most benefit to those with little or basic prior understanding of technical data used in the E&P industry. Course attendees may hold a variety of roles such as data or information managers, technical managers and assistants, technologists, geologists, geophysicists, etc.

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

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

Basic Drilling, Completion and Workover Operations – BDC

BASIC 5-Day

This course presents the basics of drilling and completion operations, plus past-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 desiring to gain an awareness 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 or workover 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 • Drilling string components: bits and accessories • Drilling fluids and hydraulic • 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, acidizing • Tubing operations • Recovery methods • Testing and formation damage • Production completion, stimulation, and workover • Well technology • Drilling engineering • Well management • Fracturing, hydraulic fracturing • Formation and sand control • Mechanical retention, chemical consolidation, and gravel packing • and more...

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/VIRTUAL-BDC

Basic Petroleum Engineering Practices – BE

BASIC 5-Day

This course is a basic introduction to most aspects of the Petroleum Engineering discipline, which includes reservoir, production, and drilling engineering as well as related topics. This course lays the groundwork for further specialized training in advanced courses for oil company and service company personnel. The course focuses on the field and application approach and includes classroom exercises, fundamental engineering problems, and basic field exercises. Basic Petroleum Engineering Practices will set the foundation for technical professionals with regards to technology and its engineering applications. The course starts out with a brief introduction of the history and current state of the oil and gas industry. Next, reservoir fluids, petroleum geology, and petroleum reservoirs are discussed. Then, various facets of exploration technology, drilling engineering and operations, well completion technology, and production technology are covered before finishing with surface processing of produced fluids.

DESIGNED FOR
Engineers, engineering trainees, technical managers and assistants, technicians, geologists, geophysicists, chemists, physicists, service company personnel, sales representatives, and data processing personnel.

YOU WILL LEARN
• Basic petroleum geology
• Reservoir fluid and rock properties
• Fundamentals of reservoir fluid flow
• Oil and gas reservoir classification, definition, delineation, and development
• Unconventional resources
• Fundamentals of well completion, development, and production operations
• Basics of casing design and primary cementing
• Primary and enhanced recovery mechanisms
• Surface operations

COURSE CONTENT
Reservoir fluid properties • Petroleum geology • Reservoir properties and evaluation • Unconventional resources • Exploration technology • Drilling engineering • Well completion, stimulation, and workover • Well testing and formation damage • Production operations • Recovery methods • Surface processing

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>18-22 Feb 2019</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td>BAKERFIELD, US</td>
<td>13-17 Nov 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>23-27 Sept 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>8-12 Oct 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>8-12 July 2019</td>
<td></td>
<td>$4170</td>
</tr>
<tr>
<td>DENVER, US</td>
<td></td>
<td>$4140</td>
</tr>
<tr>
<td>9-13 Dec 2018</td>
<td></td>
<td>$4170</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>15-19 OCT 2018</td>
<td>$4970</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 Nov 2018</td>
<td>$5120</td>
</tr>
<tr>
<td>OKLAHOMA CITY, US</td>
<td>12-16 Aug 2019</td>
<td>$4935+VAT</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>13-17 Nov 2019</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td>BAKERFIELD, US</td>
<td>13-17 Nov 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>23-27 Sept 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>8-12 Oct 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>8-12 July 2019</td>
<td></td>
<td>$4170</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>9-13 Dec 2018</td>
<td>$4170</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>15-19 OCT 2018</td>
<td>$4970</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 Nov 2018</td>
<td>$5120</td>
</tr>
<tr>
<td>OKLAHOMA CITY, US</td>
<td>12-16 Aug 2019</td>
<td>$4935+VAT</td>
</tr>
</tbody>
</table>

See website for dates and locations.

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/emailsiginup
Evaluating and Developing Heavy Oil Resources – HOED

FOUNDRATION 5-Day

Cold production, oil sands mining and in-situ thermal production methodologies are important contributors to the world’s oil production. The course takes an unbiased practical approach to the applications, citing benefits and limitations. The course provides an overview and details of specific occurrences of the geology, evaluation, development and commerciality of heavy oil/in-situ oil sands resources. Each attendee should come away with a great foundational knowledge of the business of evaluating and developing heavy oil resources.

DESIGNED FOR

Anyone from any discipline who needs a better understanding of heavy oil/oil sands resources, but more specifically designed for geoscientists or engineers with a need to better understand the challenges of discovering and developing heavy oil/oil sands resources.

YOU WILL LEARN HOW TO

• Evaluate and develop heavy oil/oil sands resources
• Understand the importance of heavy oil/oil sands resources in today’s world energy market
• Contrast heavy oil/oil sands resources as compared to conventional and other unconventional resources with aspects of finding, developing, and producing
• Understand the geology, critical attributes, and commerciality of the Canadian heavy oil/oil sands
• Collect the appropriate data and evaluate the critical geologic and reservoir parameters of various types of heavy oil/oil sands resources
• Recognize and evaluate the environmental challenges required to develop and produce heavy oil/oil sands resources
• Understand the process and methodology to evaluate, select, plan, design, and implement a heavy oil/oil sands recovery project
• Become knowledgeable of the worldwide distribution and geologic setting of the more significant heavy oil occurrences

COURSE CONTENT

Bitumen and heavy oil introduction and definitions • Comparison of conventional and unconventional reservoirs • Worldwide heavy oil/oil sands resources and occurrences • Geology and overview of Venezuela and Trinidad heavy oil resources • Introduction of United States heavy oil occurrences (Utah, California, and Texas) • Geology, history, and development of Canada heavy oil/oil sands • Heavy oil/oil sands characteristics and development strategies • Oil sands mining details and reclamation • Environmental challenges for oil sands resources • Heavy oil and in-situ oil sands recovery process review • Introduction to Steam Assisted Gravity Drainage (SAGD) • Other commercial thermal in-situ methodologies • Commercial application of Cold Heavy Oil Production with Sand (CHOPS) in Canada and other non-thermal heavy oil recovery methods • Field examples and development strategies of heavy oil and in-situ oil sands recovery projects • Overview of thermal well completions and production facilities • Reserves and economics

Evaluating and Developing Shale Resources – SRE

FOUNDRATION 5-Day

This course will cover current practices for evaluating, drilling, and completing these challenging reservoirs with the primary goal that all participants come away with a clear understanding of the role and value of every discipline in an integrated team. 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.

DESIGNED 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, light 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 wells reserves in both PDP (proved developed producing) and PUD (proved undeveloped) categories

COURSE CONTENT

Current shale plays and their global impact • Reservoir characterization and evaluation: organic quality, rock quality and mechanical 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; welfare sizes and laterals; 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 Stimulated 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 to operate

Production Geology for Other Disciplines – SRE

FOUNDRATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Geomechanics for Heavy Oil – HOGM

FOUNDRATION 3-Day

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

DESIGNED FOR

Geoscientists and reservoir engineers involved in heavy oil plays.

YOU WILL LEARN

• How to implement principles of rock mechanics and petroleum geomechanics in evaluation of reservoir containment in thermal operations

COURSE CONTENT

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

FOUNDATION 5-Day

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

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

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

COURSE CONTENT

Fundamental concepts of petrophysics
• Depositional systems and petrophysical rock parameters
• Nature of porosity and permeability
• Basic rock properties: theory and quicklook techniques
• Mudlogging
• Core analysis, acquisition, interpretation, and quality checks
• Theory and basics of resistivity, radioactivity, acoustic tools: U/W/MWD versus open hole logging
• Determination of rock types using core and logs
• Petrophysical impact on economic uncertainty
• Evolving petrophysical technologies

Well Log Interpretation – WLI

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 rockabusters to bankers. Familiarity with the purposes and optimum applications of well logs is essential for people foraging 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-plotted 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
Petrophysicists, geologists, geophysicists, engineers, technicians, or anyone interested in a solid understanding of the principles of borehole geophysics.

YOU WILL LEARN HOW TO
• Identify reservoirs
• Determine mineralogy, porosity, and saturation in various lithologies
• Recognize the importance of electrical properties of earth materials
• Highlight oil mobility
• 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, lateration • Reservoir/non-reservoir discrimination in highly-sensitiv logs, GR, SR, Po • Depth measurements and control • Borehole calipers • Porosity-mineralogy logs, density, neutron, sonic • Porosity determination in clean formations • Formation resistivity factor • Conductivity of shales • Porosity log crosstie and mineralogy identification • Partially saturated rock properties and Archie Equation • Linear movable oil pilot • Recognition techniques, Fiva, FPP, log/characteristic file • Porosity-resistivity crosstie • Permeability relationships • Nuclear magnetic resonance • Use of pressure measurements

COURSE CONTENT

Computersized log evaluation • Sidewall coring • Recommended logging programs

Corsi CCA

COURSE CONTENT

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 and utilization and is often considered to be the ground truth to which other measurements are compared (e.g., well logs). Using a multidisciplinary approach, participants are taken through the steps necessary to obtain reliable core analysis data and solve formation evaluation problems. Throughout the course, the participants are given hands-on problems and practical laboratory and field 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 special core analysis (e.g., wettability, relative permeability, capillary pressure, and reservoir fluid distribution for reservoir engineering and petrophysical evaluation)
• Prevent/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, wellsite procedures, and preservation methods • Sidewall coring and analysis • Organizing effective laboratory programs • Porosity, permeability, and fluid saturation • Unconventional Reservoir Analytical Protocol • Quality control in core analysis • Petrography and mineralogy • Special core analysis sample selection and statistical data analysis • Core-log correlation (includes nmr log calibration, acoustic, nuclear, and electrical properties) an introduction to rock mechanics • Wettability, relative permeability, capillary pressure, and reservoir fluid distribution • Data integration in reservoir simulation • Final problem: design of coring and core analysis program

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>25 FEB - 1 MAR 2019</td>
<td>$3495+VAT</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>29 JUN - 3 MAY 2019</td>
<td>$4300+GST</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>10-14 SEPT 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>7-11 APR 2019</td>
<td>$5475</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>16-22 FEB 2019</td>
<td>$4355</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>23 SEP-2 OCT 2018</td>
<td>$5070</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29 JUL-2 AUG 2018</td>
<td>$5250</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>11-15 NOV 2019</td>
<td>$5065+VAT</td>
</tr>
<tr>
<td>PERTH, AUS</td>
<td>28 OCT-1 NOV 2019</td>
<td>$5340+GST</td>
</tr>
</tbody>
</table>

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, wireless logging and log analysis, coring and core analysis, petrophysics, geophysics, geochronology, formation testing, rock mechanics, hydraulic fracturing, and petroleum economics.

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

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

COURSE CONTENT

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

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>17-21 SEP 2018</td>
<td>$4415</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>30 MAY 2018</td>
<td>$4500</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29 JUL-2 AUG 2018</td>
<td>$5285+VAT</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>8-10 JUL 2019</td>
<td>$3305</td>
</tr>
</tbody>
</table>
**CROSS-TRAINING**

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

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

**2018-19 Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGOURIE, AU</td>
<td>17-21 SEPT 2018</td>
<td>$4380</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>5-9 AUG 2019</td>
<td>$1515+VAT</td>
</tr>
</tbody>
</table>

**2018-19 Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGOURIE, AU</td>
<td>3-5 DEC 2018</td>
<td>$3265</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>16-20 NOV 2018</td>
<td>$3885</td>
</tr>
</tbody>
</table>

**Applied Rock Mechanics – ARM**

**SPECIALIZED** 3-Day

Understanding the stress, strain, and failure mechanics 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 mechanics 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, stresses, and loads • Geomechanics and structural geology • Wellsite and field measurement of in-situ (earth) stresses • Overview of common rock mechanics tests (lab demonstrations) • Stress orientation techniques • Borehole stability analysis • Sand control • Fracture mechanics • Unconventional reservoir applications • Wellbore engineering applications • Wireline log predicted mechanical properties • Data integration

**2018-19 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>3-5 DEC 2018</td>
<td>$3265</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>16-20 NOV 2018</td>
<td>$3885</td>
</tr>
</tbody>
</table>

**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, ROC, RDT, and FFR, 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 geodata technicians of multidisciplinary formation evaluation and development teams engaging in explorations, appraisals, and field development activities.

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

**COURSE CONTENT**
Wireline 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, FWW, 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 compartmentalization control; sampling principles and fluid sample QA/QC procedures; in-situ fluid PVT analysis • Permeability test; mini-DST and VIT; practical aspects of well productivity and deliverability potential estimates

**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, axioms, and basic calculations regularly utilized by production techs are covered. Emphasis is upon proven technology required to effectively develop and operate an asset in a multidiscipline 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.

**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
- Design 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 well 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 • Inflow and outflow performance • Artificial lift well completion systems (beam pump, gas-lift, ESP, PCP, plunger lift) • Formation damage and well acidizing • Perforating practices • Sand control • Hydraulic fracturing • Shale gas and oil development and more...

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>20 MAY - 23 AUG 2019</td>
<td>$4325</td>
</tr>
<tr>
<td>THE HAGUE, NLD</td>
<td>9 SEP - 6 DEC 2019</td>
<td>$4325</td>
</tr>
</tbody>
</table>

**PETROSKILLS.COM/VIRTUAL-PTO**

**2018-19 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>19-23 AUG 2019</td>
<td>$4350</td>
</tr>
<tr>
<td>KUALA LUMPUR, MY</td>
<td>11-15 MAY 2019</td>
<td>$3985</td>
</tr>
<tr>
<td>KUALA LUMPUR, MY</td>
<td>25-29 MAY 2019</td>
<td>$3245</td>
</tr>
<tr>
<td>THE HAGUE, NLD</td>
<td>22-26 JULY 2019</td>
<td>$5060</td>
</tr>
</tbody>
</table>
Production Operations 1 – PO1

FOUNDATION

PO1 represents the core foundation course of PetroSkills’ production engineering curriculum and is the basis for future oilfield operations studies. Course participants will become familiar with both proven historical production practices as well as current technological advances to maximize oil and gas production and overall resource recovery. The course structure and pace apply a logical approach to learn safe, least cost, integrated analytical skills to successfully define and manage oil and gas operations. Applied skills guide the participant with a framework to make careful, prudent, technical, oil and gas business decisions. Currently emerging practices in the exploitation of unconventional resources including shale gas and oil, and heavy oil and bitumen complement broad, specific coverage of conventional resource extraction.

DESIGNED FOR

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers, and especially engineers starting a work assignment in production engineering and operations or other engineers seeking a well-rounded foundation in production engineering.

YOU WILL LEARN HOW TO

- Recognize geological models to identify conventional and unconventional (shale oil and gas and heavy oil) hydrocarbon accumulations
- Understand key principles and parameters of well inflow and outflow
- Build accurate nodal analysis models for tubing size selection and problem well review
- Design and select well completion tubing, packer, and other downhole equipment tools
- Plan advanced well completion types such as multilateral, extended length, and intelligent wells
- Design both conventional and unconventional multi stage fractured horizontal wells
- Apply successful primary casing cementing and remedial repair techniques
- Select equipment and apply practices for perforating operations
- Plan well intervention jobs using wireline, snubbing, and coiled tubing methods
- Manage corrosion, erosion, soluble and insoluble scales, and produced water handling challenges
- Apply well completion and workover fluid specifications for solids control and filtration
- Employ the five main types of artificial lift systems
- Identify formation damage and apply remedial procedures
- Design and execute successful carbonate and sandstone reservoir acidizing programs
- Understand the causes of sand production and how to select sand control options
- Understand the proper use of oilfield surfactants and related production chemistry
- Identify and successfully manage tight paraffin and asphaltene deposits
- Choose cased hole production logging tools and interpret logging results
- Understand modern conventional fracture stimulation practices
- Understand multistage, horizontal well shale gas and shale oil massive frac job design and operations
- Review heavy oil development and extraction including mining operations and current modern thermal processes

COURSE CONTENT

Importance of the geological model • Reservoir engineering fundamentals in production operations • Understanding inflow and outflow and applied system analysis • Well testing methods applicable to production operations • Well completion design and related equipment • Primary and remedial cementing operations • Perforating design and applications • Completion and workover well fluids • Well intervention: wireline, hydraulic workover units, and coiled tubing • Production logging • Artificial lift completion: rod pump, gas lift, ESP, PCP, plunger lift, and others • Problem well analysis • and more...

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Start Date</th>
<th>End Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>20-23 MAY 2019</td>
<td>$7750 +GST</td>
<td></td>
</tr>
<tr>
<td>DENER, US</td>
<td>12-26 JUNE 2019</td>
<td>$7650</td>
<td></td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>4-15 NOV 2018</td>
<td>$9350+VAT</td>
<td></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>2-13 DEC 2019</td>
<td>$8650+VAT</td>
<td></td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>7-18 OCT 2019</td>
<td>$9410</td>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>22 APR-3 MAR 2019</td>
<td>$7750</td>
<td></td>
</tr>
<tr>
<td>MELBOURNE, AU</td>
<td>22 DECEMBER 2019</td>
<td>$7650</td>
<td></td>
</tr>
</tbody>
</table>

* plus computer charge

P01 is also available as a virtual course which is an enhanced version of the face-to-face public session.

<table>
<thead>
<tr>
<th>Start Date</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 MAR - 21 JUN 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>27 MAY - 20 SEP 2019</td>
<td>$7570</td>
</tr>
<tr>
<td>16 SEP 2019 - 17 JAN 2020</td>
<td>$7570</td>
</tr>
</tbody>
</table>

TO LEARN MORE, VISIT
PETROSKEILLS.COM/PO1-BLENDED
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 logging 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 cased-hole surveys.

YOU WILL LEARN HOW TO
- Measure zonal inflows 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 autopsy (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 cable • Pulsed neutron capture logs (including oxygen activation and nonradioactive tracers) • Pulsed neutron spectroscopy logs • Arrow mini-spinner logs • Array fluid holdup logs (optical, capacitance, and resistance) • Multiphase flow and slip velocity • and more...

Horizontal and Multilateral Wells: Completions and Stimulation – HML2

SPECIALIZED 5-Day
Successful multilateral and horizontal wells require new considerations, interdisciplinary planning, and special techniques. This intense course addresses the critical need for a proper understanding of all aspects of horizontal and multilateral design, completion, and stimulation that make these wells unique. It is designed for those planning or working with horizontal and multilateral wells and interested in effective use of the latest technology. Basic understanding of important reservoir characteristics, hole stability, formation damage, crucial zonal isolation, and hydraulic fracturing are just some of the critical issues addressed by this course. Hydraulic fracturing aspects of unconventional resources plays, including conductivity, proppant selection, and practices, are discussed. A combined practical and technical theme is employed, with emphasis on economy and efficiency in designing, completing, and producing horizontal and multilateral wells.

DESIGNED FOR
Completion, production, reservoir, and research engineers; geologists; managers in completion, production, drilling, and exploration; others involved in various phases of horizontal and multilateral wells or interested in gaining an interdisciplinary up-to-date understanding of this continually evolving technology.

YOU WILL LEARN HOW TO
- Successfully design and optimize horizontal and multilateral well completions
- Engineer wells, taking into account limitations imposed by wellbore stability and borehole friction
- Determine the appropriate zonal isolation methods for horizontal and multilateral wells
- Perform hydraulic fracturing of horizontal wells
- Design damage removal, stimulation, and workover operations

COURSE CONTENT
Reservoir characteristics for horizontal and multilateral well applications • Well performance prediction methods for bore stability of horizontal wells • Stress field effect on drilling, completion, production, and stimulation • Geosteering • Multilateral well structure, junction, and application • Formation damage and its effect on horizontal well performance • Well completion and its effect on horizontal and multilateral wells • Intelligent completion: downhole monitoring and control • Well trajectory and completion optimization • Horizontal well fracturing • Assisting of horizontal wells • Other stimulation methods

Petroleum Risk and Decision Analysis – PRD

FOUNDATION 5-Day
Good technical and business decisions are based on competent analysis of project costs, benefits and risks. Participants learn the decision analysis process and foundation concepts so they can actively participate in multi-discipline evaluation teams. The focus is on designing and solving decision models. About half the problems relate to exploration. The methods apply to R&D, risk management, and all capital investment decisions. Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations. Decision tree and influence diagrams provide clear communications and the basis for valuing each alternative. The complementary Monte Carlo simulation technique is experienced in detail in a hand-calculation exercise. Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. The mathematics is straightforward and mostly involves only common algebra. This is a fast-paced course and recommended for those with strong English listening skills. This course is intended as the prerequisite for the Advanced Decision Analysis with Portfolio and Project Modeling course.

DESIGNED FOR
Geologists, engineers, geophysicists, managers, team leaders, economists, and planners.

YOU WILL LEARN HOW TO
- Describe the elements of the decision analysis process and the respective roles of management and the analysis team
- Express and interpret judgments about risks and uncertainties as probability distributions and popular statistics
- Represent discrete risk events in Venn diagrams, probability trees, and joint probability tables
- Solve for expected values with decision trees, payoff tables, and Monte Carlo simulation (hand calculations)
- Craft and solve decision models
- Evaluate investment and design alternatives with decision tree analysis
- Develop and solve decision trees for value of information (VOI) problems

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

2018-19 Schedule and Tuition (USD)

2018-19 Schedule and Tuition (USD)

HOUSTON, US
10-14 DEC 2018 $4440
16-20 DEC 2018 $4245
* plus computer charge

OKLAHOMA CITY, US
17-21 SEPT 2018 $4330
7-11 OCT 2019 $4470

KUALA LUMPUR, MY
15-19 JUN 2019 $4850+VAT
8-12 OCT 2018 $4850+VAT
7-11 OCT 2019 $5035+VAT

TULSA, US
10-14 OCT 2019 $4190

LUKE, UK
21-25 APR 2019 $4890+VAT
2-6 SEP 2019 $5135+VAT
* plus computer charge

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 (PPM20) and Project Management for Upstream Field Development (FPMD2) 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 work 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

2018-19 Schedule and Tuition (USD)

2018-19 Schedule and Tuition (USD)

HOUSTON, US
5-9 NOV 2018 $4340
4-8 NOV 2019 $4255
3-7 DEC 2018 $4510
10-14 DEC 2019 $4325

KUALA LUMPUR, MY
15-19 JUN 2019 $5220
8-12 OCT 2018 $4850+VAT
7-11 OCT 2019 $5035+VAT

LONDON, UK
3-7 SEPT 2018 $4990+VAT
2-6 SEP 2019 $5135+VAT
* plus computer charge
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 your external influences for new 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 understand natural roles 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

2018-19 Schedule and Tuition (USD)

| Location        | Dates          | Price/Person
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DENVER, US</td>
<td>16-20 SEP 2019</td>
<td>$4230</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>22-26 APR 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>ORLANDO, US</td>
<td>3-7 DEC 2018</td>
<td>$4180</td>
</tr>
<tr>
<td>2-6 DEC 2018</td>
<td>$4270</td>
<td></td>
</tr>
</tbody>
</table>

Expanded Basic Petroleum Economics – BEC

BASIC 5-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. This course will provide the fundamentals necessary to enable you to do so. Budgeting and financing, accounting, and contractual arrangements, which also significantly impact the economic viability of a project, are covered. Participants practice cash flow techniques for economic evaluations and investigate frequently encountered situations. Participants are invited to submit their own economic problems (in advance), if appropriate. Each participant will receive Economics of Worldwide Petroleum Production, written specifically for PetroSkills courses.

DESIGNED FOR

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

YOU WILL LEARN

• How to evaluate the economic viability of a project
• Cash flow techniques applicable in economic evaluations
• Models to weigh risk and uncertainty
• Techniques to determine expected value
• The effects, budgeting, and contractual agreements have on a project
• The basic principles of accounting

COURSE CONTENT

Forecasting oil production • Defining reserves, operating expenses, capital expenditures, inflation, factors affecting oil and gas prices • Cash flow techniques • Economic criteria: interest, hurdle rate, time value of money, selection, ranking criteria • Risk, uncertainty: types of risk, mathematical techniques, probabilistic models, uncertainty in economic analysis • Financing, ownership in the oil and gas industry: business arrangements between operators, between mineral owners • Accounting versus cash flow: accounting principles and definitions, differences between accounting cash numbers, depreciation, depletion, amortization • Budgeting types, processes, selecting of projects for the budget • Economic analysis of operations • Computer economics software • Tips on economic factors in computer spreadsheet analysis • Ethics in economic analyses

2018-19 Schedule and Tuition (USD)

| Location        | Dates          | Price/Person
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABU DHABI, UAE</td>
<td>16-23 JUNE 2019</td>
<td>$5345+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>26-30 AUG 2019</td>
<td>$4220</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>15-19 OCT 2018</td>
<td>$4180</td>
</tr>
<tr>
<td>11-15 FEB 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>29-APR-3 MAY 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>15-19 JULY 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>11-15 OCT 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>22-26 JULY 2019</td>
<td>$5120</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>5-7 SEPTEMBER</td>
<td>$4790+VAT</td>
</tr>
<tr>
<td>16-20 SEPTEMBER</td>
<td>$4855+VAT</td>
<td></td>
</tr>
<tr>
<td>SAN FRANCISCO, US</td>
<td>12-16 NOV 2018</td>
<td>$4090</td>
</tr>
<tr>
<td>11-15 NOV 2018</td>
<td>$4170</td>
<td></td>
</tr>
</tbody>
</table>

Economics of Worldwide Petroleum Production – EWP

FOUNDATION 5-Day

In the area of corporate and international petroleum production, do you know how to choose the best investments? Can you properly evaluate investment opportunities? Do you know what investment criteria really mean and which criteria to use for best results? Answers to these questions will greatly improve your ability to make profitable decisions. Techniques for predicting profit, production, operating costs, and cash flow enable the analyst to evaluate decision alternatives for optimum results. Understanding cost of capital, financial structure, risk and uncertainty, present worth, rate of return, and other economic yardsticks enhances the quality and the value of economic analysis. Discussion of real-life examples with participants from many different countries enhances the value of the course.

DESIGNED FOR

Managers, supervisors, and operating personnel concerned with costs, profitability, budgets, the company bottom line and other aspects of economic analysis of petroleum production on a project, corporate, and worldwide level, who have had some previous experience in this area. Due to similarly in content, PetroSkills recommends that participants take this course if they have some previous experience in this field as the course content is more advanced than Expanded Basic Petroleum Economics. Take one or the other, but not both courses.

YOU WILL LEARN HOW TO

• Use cash flow techniques in economic evaluations
• Evaluate and choose investment opportunities
• Use models to weigh risk and uncertainty
• Evaluate and decision alternatives using predictive techniques
• Evaluate how projects affect the corporation

COURSE CONTENT

Pricing: natural gas, marker crudes, OPEC, spot and futures markets, transportation • Production rate: mathematical models • Cash flow: revenue, capital and operating costs, spreadsheet exercises • Economic analysis: present value concept, sensitivities, risk analysis, decision trees, royalty, sources of capital, incremental economics, sunk costs, inflation • Budgeting: examples and exercises, long-run planning • Cash versus write-off decision: depreciation, depletion, and amortization • How to read an annual report: statements, financial ratios, what is and is not included, reading between the lines • Worldwide business operations: concessions, licenses, production sharing contracts, joint ventures, cost of capital, sources of funding, debt and equity • Performance appraisal: buy/sell assessments • Computer economics software • Tips on format and inclusion of economic factors in computer spreadsheet analysis • Ethics in economic analyses

2018-19 Schedule and Tuition (USD)

| Location        | Dates          | Price/Person
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>22-26 JULY 2019</td>
<td>$5120</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>17-21 SEPTEMBER</td>
<td>$4985+VAT</td>
</tr>
<tr>
<td>4-8 MAR 2019</td>
<td>$5035+VAT</td>
<td></td>
</tr>
</tbody>
</table>

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 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

2018-19 Schedule and Tuition (USD)

| Location        | Dates          | Price/Person
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>9-10 MAY 2019</td>
<td>$2955</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>8-9 NOV 2018</td>
<td>$2915+VAT</td>
</tr>
</tbody>
</table>
**Applied Environmental Management Systems – AEM**

**FOUNDATION 5-Day**

NEW

Since the Rio de Janeiro Earth Summit (UNCED) held in 1992, environmental issues have been drawn to the forefront of organizations’ operations and possibly their reputations. A review of the world’s press often reveals spills, 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

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

**FOUNDATION 5-Day**

NEW

Every 15 seconds, somewhere in the world, a worker is killed and over 150 others are injured. Our members’ and clients’ experience is that committed application of an Occupational Health and Safety Management System (OH&S Management System) 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 OH&S-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 OH&S-MS (ILO OSH-2001, ISO 50401-2001, ILO GHS-2001, IDGPH 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 OH&S-MS in a typical petrochemical organisation
- Identify and integrate key tools associated with OH&S management, including HazID, risk assessment, JSA, PTW, LOTO, active and reactive monitoring
- Reflect on, shape and initiate improvements in the safety culture of an organization
- Communicate a powerful improvement message to a team of senior leaders

**COURSE CONTENT**

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

**Our Participants Say it Best.**

“The instructor was very knowledgeable, and was effective in his demonstration of the material. He was great at providing relevant case histories and real life examples.”

DEREK  |  BASIC DRILLING, COMPLETION AND WORKOVER OPERATIONS  |  PDO  |  DUBAI

“I definitely improved my knowledge on the subject and systematized all the previously known unsorted information.”

JESSICA  |  BASIC GEOPHYSICS  |  BGP  |  HOUSTON

“The course was very interactive, engaging, and educative, especially with such an experienced instructor. He has vast knowledge in various fields in the oil industry.”

KABIR  |  PERFORMANCE ANALYSIS, PREDICTION AND OPTIMIZATION USING NODALTM ANALYSIS  |  POZ  |  DUBAI

“ ‘The instructor was very knowledgeable, and was effective in his demonstration of the material. He was great at providing relevant case histories and real life examples.’”

DEREK  |  BASIC DRILLING, COMPLETION AND WORKOVER OPERATIONS  |  BOC  |  BAKERSFIELD

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
- Petrophysics
- 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