NEW in 2018-19

- Advanced Practices in Exploration and Development of Unconventional Resources (pg 16)
- Advanced Project Management Workshop (pg 57)
- Applied Environmental Management Systems (pg 46)
- ArcGIS Pro Essentials for Petroleum (pg 50)
- Artificial Lift for Unconventional Wells (pg 41)
- Computer-Based Subsurface Mapping (pg 9)
- Management Systems Lead Auditor (pg 46)
- Managing Non-Technical Risks (pg 51)
- NEW PetroAcademy Virtual/Blended Learning Options:
  - Basic Drilling, Completion, and Workover Operations (pg 6)
  - Basic Geophysics (pg 15)
  - Basic Reservoir Engineering (pg 29)
  - Completions and Workovers (pg 37)
  - Production Technology for Other Disciplines (pg 38)
A competent workforce has always been critical for our industry’s success, but it is even more important with challenging product prices. Doing more with less is how we can thrive in hard times, but that requires a very competent workforce.

This guide presents the industry’s most comprehensive workforce development programs – focused on building competent people. PetroSkills brings together industry-driven and industry-approved programs that deliver flexible, practical, fit-for-purpose training and development. This guide can help you find ways to advance your technical competence and build your company’s value.

Since the first offerings of Production Operations 1 and the Campbell Gas Course® over 50 years ago, PetroSkills instructor-led training programs have set the standard for excellence from subsurface to downstream. This guide presents hundreds of sessions offered worldwide by top industry experts in each technical discipline across the value chain. Our competency-based programs are designed and delivered under the direction of the PetroSkills Alliance which includes some of the top petroleum companies worldwide, working together, to offer an industry-driven and vetted set of courses, products and services.

NEW courses to look for in this edition include:
- Advanced Practices in Exploration and Development of Unconventional Resources (EDUR) - see page 16
- Advanced Project Management Workshop (APMWW) - page 57
- Applied Environmental Management Systems (AEMS) - page 46
- Applied Occupational Health and Safety Management Systems (HSMS) - page 46
- ArcGIS Pro Essentials for Petroleum (GISP) - page 50
- Artificial Lift for Unconventional Wells (ALUW) - page 41
- Computer-Based Subsurface Mapping (CSM) - page 9
- Management Systems Lead Auditor (AUD) - page 46
- Managing Non-Technical Risks (MNTR) - page 51

In addition to our instructor-led programs, our digital learning solutions and professional services continue to lead the industry. This guide outlines our electronic solutions ePilot™, ePetro™, ActiveLearner®, Compass® and PetroCore® - see page 4 for more details.

We are also proud to announce the expansion of our blended/virtual learning program, PetroAcademy™. This unique course model delivers the same competency development as our face-to-face courses via virtually delivered Skill Modules™, available from anywhere in the world.

The following blended/virtual courses are available now and we will be adding more throughout 2019. For more information, see the back cover, or petroskills.com/blended.

- Applied Reservoir Engineering - page 29
- Basic Drilling, Completion, and Workover Operations - page 6
- Basic Geophysics - page 15
- Basic Petroleum Technology Principles - page 5
- Basic Reservoir Engineering - page 29
- Casing Design Workshop - page 20
- Completions and Workovers - page 37
- Foundations of Petrophysics - page 24
- NODAL Analysis Workshop - page 33
- Production Operations 1 - page 37
- Production Technology for Other Disciplines - page 38
- Scale Identification, Remediation, and Prevention Workshop - page 44

I hope you find this guide useful. If there is any way that we can help you, your team, or your organization, please don’t hesitate to contact me personally at ford.brett@petroskills.com, or contact our Customer Service Department at +1.918.828.2500.

Cover Image:
Shotover River Mouth, Queenstown, New Zealand.

Message from the CEO

A competent workforce has always been critical for our industry’s success, but it is even more important with challenging product prices. Doing more with less is how we can thrive in hard times, but that requires a very competent workforce.

This guide presents the industry’s most comprehensive workforce development programs – focused on building competent people. PetroSkills brings together industry-driven and industry-approved programs that deliver flexible, practical, fit-for-purpose training and development. This guide can help you find ways to advance your technical competence and build your company’s value.

Since the first offerings of Production Operations 1 and the Campbell Gas Course® over 50 years ago, PetroSkills instructor-led training programs have set the standard for excellence from subsurface to downstream. This guide presents hundreds of sessions offered worldwide by top industry experts in each technical discipline across the value chain. Our competency-based programs are designed and delivered under the direction of the PetroSkills Alliance which includes some of the top petroleum companies worldwide, working together, to offer an industry-driven and vetted set of courses, products and services.

NEW courses to look for in this edition include:
- Advanced Practices in Exploration and Development of Unconventional Resources (EDUR) - see page 16
- Advanced Project Management Workshop (APMWW) - page 57
- Applied Environmental Management Systems (AEMS) - page 46
- Applied Occupational Health and Safety Management Systems (HSMS) - page 46
- ArcGIS Pro Essentials for Petroleum (GISP) - page 50
- Artificial Lift for Unconventional Wells (ALUW) - page 41
- Computer-Based Subsurface Mapping (CSM) - page 9
- Management Systems Lead Auditor (AUD) - page 46
- Managing Non-Technical Risks (MNTR) - page 51

In addition to our instructor-led programs, our digital learning solutions and professional services continue to lead the industry. This guide outlines our electronic solutions ePilot™, ePetro™, ActiveLearner®, Compass® and PetroCore® - see page 4 for more details.

We are also proud to announce the expansion of our blended/virtual learning program, PetroAcademy™. This unique course model delivers the same competency development as our face-to-face courses via virtually delivered Skill Modules™, available from anywhere in the world.

The following blended/virtual courses are available now and we will be adding more throughout 2019. For more information, see the back cover, or petroskills.com/blended.

- Applied Reservoir Engineering - page 29
- Basic Drilling, Completion, and Workover Operations - page 6
- Basic Geophysics - page 15
- Basic Petroleum Technology Principles - page 5
- Basic Reservoir Engineering - page 29
- Casing Design Workshop - page 20
- Completions and Workovers - page 37
- Foundations of Petrophysics - page 24
- NODAL Analysis Workshop - page 39
- Production Operations 1 - page 37
- Production Technology for Other Disciplines - page 38
- Scale Identification, Remediation, and Prevention Workshop - page 44

I hope you find this guide useful. If there is any way that we can help you, your team, or your organization, please don’t hesitate to contact me personally at ford.brett@petroskills.com, or contact our Customer Service Department at +1.918.828.2500.

Cover Image:
Shotover River Mouth, Queenstown, New Zealand.
What Sets PetroSkills Apart? The Alliance.

Created in 2001 by BP, Shell, and OGCI, the PetroSkills Alliance provides “important but not unique” high quality, business-relevant, competency-based training. Through its growing membership, the Alliance has successfully evolved into an industry-driven and approved program that spans the value chain.

Mission: Build competent petroleum professionals by delivering learning and development when, where, and how customers need it.

OBJECTIVES:

• Provide the highest quality, business relevant programs that span all technical processes, and give management assurance they have the skilled people needed to maximize asset value
• Offer added value to employees via new, broad-reaching courses that fill gaps, deliver the ability to perform, and provide the assurance to prove it
• Ensure PetroSkills instructors are the best available
• Develop and continuously improve PetroSkills Competency Maps and progression trees; continue to align Competency Maps with corporate business goals
• Lower internal training costs by reducing administrative burdens, improving economies of scale, and/or eliminating marginal courses
• Increase the availability of courses in both the number of offerings and the number of delivery locations, thereby delivering competencies at the lowest total cost

For more information on membership, go to petroskills.com/membership
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 to 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
How do you meet the challenges of competency development?

PetroSkills Solutions

PetroAcademy™
Blended Learning Skill Modules. Integrating live classroom activities, online learning and technical coaching.

Competency Maps
Industry Benchmarks. Developed with industry-leading Alliance members.

ActiveLearner™
Learning and Compliance Management System. Online, on-the-job access to learning programs, progress tracking, and curriculum development.

Compass™
Competency Management. Web-based software that builds, manages, and assures competency.

ePilot™ and ePetro™
e-Learning. Online learning libraries deliver effective training anytime, anywhere.

Technical Reference. Online, on-demand access to technical knowledge, documents, and articles.

petroskills.com/solutions
PetroAcademy Blended Learning Programs may include activities such as reading assignments, self-paced e-Learning, virtual instructor-led sessions, discussion forums, group exercises, case studies, quizzes, field trips, and other activities. These continuous development activities increase knowledge retention, reduce time to competency, and provide just in time learning at the point of need.

Blended Learning Program Example:

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

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

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

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

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

2018-19 Schedule and Tuition (USD)

HOUSTON, US
<table>
<thead>
<tr>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-12 OCT 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>11-15 MAR 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>8-12 JUL 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>7-11 OCT 2019</td>
<td>$4225</td>
</tr>
</tbody>
</table>

KUALA LUMPUR, MYS
<table>
<thead>
<tr>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-22 NOV 2019</td>
<td>$4970</td>
</tr>
</tbody>
</table>

LONDON, UK
<table>
<thead>
<tr>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9 NOV 2019</td>
<td>$4795+VAT</td>
</tr>
<tr>
<td>3-7 JUNE 2019</td>
<td>$4895+VAT</td>
</tr>
<tr>
<td>4-8 NOV 2019</td>
<td>$4895+VAT</td>
</tr>
</tbody>
</table>

NEW ORLEANS, US
<table>
<thead>
<tr>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10 MAY 2019</td>
<td>$4770</td>
</tr>
</tbody>
</table>

For more information, visit petroskills.com/blended
### Overview of the Petroleum Industry
- **OVP**
  - **BASIC** 2-Day

OVP presents an overview of the Petroleum Industry from the point of view of the Asset Life Cycle. Participants will gain an understanding of Exploration, Appraisal, Development and Production phases with particular emphasis being placed on actions they can personally take within each phase to support value creation. Through use of lecture, multimedia and class interactive exercises, a breadth of upstream business acumen will be delivered covering economic, business, geoscience and engineering topics. Discussions will include topics related to all types of resource plays including deepwater, shale oil/gas and enhanced oil recovery technologies.

### Basic Petroleum Engineering Practices
- **BEP**
  - **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.

### Basic Drilling, Completion and Workover Operations
- **BDC**
  - **BASIC** 5-Day

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

### Field Study – Heavy Oil Resources
- **HOF**
  - **BASIC** 3-Day

FIELD TRIP
This course is geologically and technically focused but instructed in such a manner that all disciplines and experience levels will understand. Technologies for mining and in-situ production of bitumen from the Athabasca oil sand region are reasonably recent commercial applications and the future levels of production face uncertainty because of highly debated environmental challenges. The field course takes the participant to the rock, explaining complex relationships and issues emanating from the depositional and structural framework.

### COURSE CONTENT
- **Overview of the drilling process**
- **Language of drilling, completing, and well intervention**
- **Drill string components: bits and accessories**
- **Drilling fluids and hydraulics**
- **Hole problems, stick pipe, side-tracking and fishing**
- **Cores and coring**
- **Electric logging, MWD, LWD**
- **Casing design and installation**
- **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**
- **Hydraulic fracturing**
- **Formation and sand control**
- **Mechanical retention, chemical consolidation, and gravel packing**
- **and more...**

### COURSE CONTENT
- **Overview of the geochemical and technical approaches in the McMurray Formation**
- **Understanding the structural setting and relationships of timing, emplacement and preservation of Alberta’s bitumen/heavy oil resource**
- **The complex lithologic heterogeneities of the McMurray and their effect on mining and in-situ production**
- **To appreciate the challenges and progress of environmental preservation efforts for the development and production of Alberta’s bitumen resource**

### COURSE CONTENT
- **Overview of the geology, history and development of Canada oil sands**
- **McMurray oil sand stratigraphy**
- **Depositional details of the McMurray formation**
- **Overview of structural evolution and bitumen resources**
- **Oil sand mining methodology**
- **Environmental challenges for Alberta’s bitumen resources**
- **Current status and future plans for reclamation mining activities**

---

**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

### 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>$4140</td>
</tr>
<tr>
<td>BAKERSFIELD, US</td>
<td>13-17 MAY 2019</td>
<td>$4170</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>23-27 SEP 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>8-12 OCT 2018</td>
<td>$4225</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>21-25 OCT 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>EUGENE, OR</td>
<td>21-25 OCT 2019</td>
<td>$4225+VAT</td>
</tr>
<tr>
<td>FORT MCMURRAY, CAN</td>
<td>11-15 DEC 2019</td>
<td>$4225+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>8-12 DEC 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>15-19 DEC 2018</td>
<td>$4225</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 OCT 2019</td>
<td>$4225+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 AUG 2019</td>
<td>$4225+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>1-5 SEP 2019</td>
<td>$4225</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>16-20 SEP 2019</td>
<td>$4225</td>
</tr>
</tbody>
</table>

† includes field trip

---

**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>BAKERSFIELD, US</td>
<td>13-17 MAY 2019</td>
<td>$4170</td>
</tr>
<tr>
<td>CALGARY, CAN</td>
<td>23-27 SEP 2019</td>
<td>$4170+GST</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>8-12 OCT 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>DALLAS, US</td>
<td>21-25 OCT 2019</td>
<td>$4140</td>
</tr>
<tr>
<td>EUGENE, OR</td>
<td>21-25 OCT 2019</td>
<td>$4140+VAT</td>
</tr>
<tr>
<td>FORT MCMURRAY, CAN</td>
<td>11-15 DEC 2019</td>
<td>$4140+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>8-12 DEC 2019</td>
<td>$4140+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>15-19 DEC 2018</td>
<td>$4140+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 OCT 2019</td>
<td>$4140+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 AUG 2019</td>
<td>$4140+VAT</td>
</tr>
</tbody>
</table>

† includes field trip
Overview of Heavy Oil Resources – HOOV

BASIC 2-Day

This course is sufficiently detailed and widely focused to appeal to a broad audience, including non-technical, administrative, and business groups, as well as scientists and engineers, seeking an introduction to the business of heavy oil. Heavy oil is a large component of the world’s oil resource. Commercial mining and current in-situ thermal production methodologies are important contributors to the world’s oil production. These methodologies are reasonably recent commercial applications, and the future levels of production face uncertainty because of highly debated environmental challenges. This course takes an unbiased practical approach to the recent commercial applications of commercial mining and in-situ thermal production of heavy oil resources, citing benefits and limitations. The course provides an overview of the aspects of the geology, development and commerciality of heavy oil resources. This course contains exercises and class problems to support the presentation.

DESIGNED FOR

Anyone from any discipline who needs a better understanding of heavy oil resources.

YOU WILL LEARN HOW TO

• The geologic and engineering challenges to finding, developing, and producing heavy oil resources
• About the importance of heavy oil resources in today’s world energy market
• How to evaluate the challenges and opportunities for understanding and improving the environmental footprint required to develop and produce heavy oil resources
• The contrast between heavy oil resources versus conventional and other unconventional resources with aspects of finding, developing, and producing
• The process and methodology to plan, design, implement, and evaluate heavy oil reservoirs
• About the geology and commerciality of the Canadian Oil Sands
• About the worldwide distribution and geologic setting of the more significant heavy oil occurrences including Venezuela

COURSE CONTENT

Comparison of conventional and unconventional reservoirs • Worldwide heavy oil resources and occurrences • Bitumen and heavy oil definitions and introduction • Geology, history, and development of Canada heavy oil sands • Oil sand characteristics and development strategies • Oil sand mining details and reclamation • Oil sands in-situ project review • Introduction of Steam Assisted Gravity Drainage (SAGD) • Other commercial thermal in-situ methodologies • Environmental challenges for heavy oil resources • Geology and overview of Venezuela and Trinidad heavy oil resources • Introduction of United States heavy oil occurrences (Utah, California and Texas)

Evaluating and Developing Heavy Oil Resources – HOED

FOUNDATION 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 evaluating 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 resources
• 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 sands • Heavy 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

FOUNDATION 5-Day

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

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, tight gas, and coaled 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 technologies to shale gas and shale oil formations
• Evaluate and forecast individual well and reservoir performance
• Determine how to estimate well reserves in both P50 (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 quality properties; geological setting; rock properties; petrophysical considerations; the role of seismic data in field evaluation • Drilling: vertical vs. horizontal wells; pilot holes; fluids; MWD and LWD; wellbore sizes and lateral; drilling challenges; mechanical considerations • Completions: cased vs. open hole; perforation schemes; stimulation design and considerations; case histories • Field trials and pilots: strategies for implementing a pilot program to optimize well drilling, completion, understanding 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
The Course Progression Matrix below shows how the Geology courses in this section are structured within each topic, from Basic to Specialized. On either side of the Geology section, you will see courses in associated disciplines for cross-training. These matrices are ideal for building training plans for early-career staff or finding the right course to build upon existing knowledge and experience.

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

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

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Geology</th>
<th>Petrophysics</th>
<th>Geophysics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Michael Grammer</td>
<td>Dr. James Graham</td>
<td>Ms. Randi Martineau</td>
<td>Dr. John Sieder</td>
</tr>
<tr>
<td>Mr. Peter Barlow</td>
<td>Mr. Andrew Harper</td>
<td>Dr. Mark McCaffery</td>
<td>Mr. M. Sohaddad</td>
</tr>
<tr>
<td>Dr. Steven Boyer</td>
<td>Dr. Howard Johnson</td>
<td>Dr. Tim Mancon</td>
<td>Dr. Tom Temple</td>
</tr>
<tr>
<td>Mr. Satinder Chopra</td>
<td>Mr. John Kersberay</td>
<td>Mr. James Morse</td>
<td>Dr. William Wain</td>
</tr>
<tr>
<td>Mr. John Dillon</td>
<td>Mr. Jeff Leek</td>
<td>Mr. Larry Moyer</td>
<td>Dr. John Pigott</td>
</tr>
<tr>
<td>Dr. Michael Grammer</td>
<td>Mr. Larry Ling</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Basic Petroleum Geology – BG

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

**Designed for**

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

### You Will Learn

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

### Course Content

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

### 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>Houston, TX</td>
<td>8-12 Oct 2018</td>
<td>13-17 Nov 2018</td>
<td>$4140</td>
</tr>
<tr>
<td>London, UK</td>
<td>17-21 Sept 2018</td>
<td>7-11 Oct 2018</td>
<td>$4795+VAT</td>
</tr>
<tr>
<td>London, UK</td>
<td>17-21 Sept 2018</td>
<td>7-11 Oct 2018</td>
<td>$4795+VAT</td>
</tr>
</tbody>
</table>
Computer-Based Subsurface Mapping – CSM

FOUNDATION 5-Day

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

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Understand the impact of different algorithms on output maps
• Determine appropriate choice of algorithm and gridding parameters for different data types and geologic scenarios
• Create structure, thickness, and attribute grids using different techniques
• Quality control and edit grids and contours
• Use grid operations to manipulate existing grids and create new grids through simple and complex operations
• Generate Combined Risk Element Maps
• Generate detailed gross rock volume grids

COURSE CONTENT

Introduction to mapping • Contouring review • Coordinate system overview • Gridding introduction • Gridding algorithms overview • Creating structure maps from well data • Creating maps from seismic data • Incorporating faults in structural maps • Creating isochore/attribute maps from well data • Grid quality control • Grid editing • Grid operations • Creating and combining stoplight maps • Volumetrics

Carbone Reservoirs – PCR

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Sandstone Reservoirs – SR

Mapping Subsurface Structures – MSS

Foundation 5-Day

Not just a collection of rules of thumb, this class presents the fundamental concepts and techniques required to accurately construct structure maps in 3D so that you will get the most from your data. The concepts and techniques are illustrated by solving numerous exercises by hand (with drafting tools and a calculator) using strategies and workflows analogous to those that participants will use back at the office using computers. Participants will be prepared to develop more accurate structural models of reservoirs, avoid dry holes, find new traps in old fields, extract the maximum information from exploration wells, and validate or recognize errors in existing interpretations. Dr. Richard Groshong’s book, 3D Structural Geology, is included with the course materials.

DESIGNED FOR

Development geoscientists and those exploring mature areas; early-career geoscientists and technologists who make structure maps; those who need to judge the validity of maps and cross sections.

YOU WILL LEARN HOW TO

• Recognize common contouring pitfalls
• Find thickness in deviated wells
• Use thickness mapping techniques
• Construct predictive cross sections
• Apply the best techniques for predicting data
• Make fault maps and integrate them with horizon maps
• Build a complete 3D interpretation
• Recognize valid and invalid fault surfaces
• Interpret faults and folds from dipmeters
• Construct juxtaposition (Allan) diagrams for fault trap and seal analysis
• Map structures with multiple overlapping faults

cOURSE CONTENT

Manual and computer contouring techniques • Using dip in mapping • Different measures of thickness • Thickness in deviated wells • Thickness maps • Dip-dominant cross sections • Data projection • Trend and plunge of folds on topographic maps • Composite-surface maps • Fault shapes and displacement distributions • Relationships between stratigraphic separation and heave & throw • Faults on isopach maps • Mapping across faults • Structural quality-control techniques • Multiple-surface map compatibility • Map validation using implied fault contours • Finding faults and fault orientations with SCAT analysis of dipmeters • Soft linked and hard linked faults • Relay and branching fault patterns • Mapping sequential cross-cutting faults

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>12-16 NOV 2018</td>
<td>$4365</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>11-15 NOV 2019</td>
<td>$4355</td>
</tr>
</tbody>
</table>

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Geochemistry: Tools for Effective Exploration and Development – MGT

FOUNDATION 5-Day

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

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

**YOU WILL LEARN HOW TO**
- Characterize exploration risk in conventional and unconventional petroleum systems
- Integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression to optimize field development
- Assess frac height in unconventional reservoirs, and identify ‘cross talk’ between frac networks in adjacent wells
- Quantify the abundance of frac water vs formation water in the produced fluids from recently drilled unconventional wells
- Use geochemical tools, including TOC, Rock-Eval pyrolysis, vitrinite reflectance, geochemical logs, gas chromatography, stable isotopes, biomarkers, mud gas isotopic data, and mud gas compositional data
- Determine if hydrocarbon ‘stray gases’ found in an aquifer are, or are related to petroleum drilling activities in a given area
- Design geochemical studies and collect samples
- Recognize pitfalls in geochemical interpretations

**COURO CONTENT**
Assess source rock quality, maturity, and petroleum-generating potential • Applicability of mud gas isotopic data and mud gas compositions • Assess reservoir continuity, lateral and vertical changes in oil gravity and viscosity • Geochemical assessment of frac height • Geochemical allocation of commingled production • Case studies • Determining the origin of hydrocarbon gases found in aquifers

**Unconventional Reservoirs • Reservoir geology interpretation • Seismology • Clastic/carbonate correlation and stratigraphy • Structural geology • Application of computerized modeling • Production geology for Other Disciplines**

Geomechanics for Heavy Oil – HOGM

FOUNDATION 3-Day

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

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

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>18-22 NOV 2018</td>
<td>$4435</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CAN</td>
<td>27-29 MAY 2019</td>
<td>$3145+GST</td>
</tr>
</tbody>
</table>

**Petroleum Systems Analysis – PSA**

FOUNDATION 5-Day

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

**DESIGNED FOR**
Geologists, geophysicists, and petrophysicists working on basin, play, prospect or reservoir evaluation, and reservoir engineers seeking a better understanding of the geoscience of their reservoir, or field. The course provides a refresher in new concepts in this field for geoscientists at a fundamental level.

**YOU WILL LEARN HOW TO**
- Employ Petroleum System concepts as a holistic approach to risk and volume estimation in play, prospect, and reservoir evaluation
- Predict and confirm source rock distribution from rock and fluid data, and estimate volumetric potential
- Predict the temperature, timing, volumes, compositions and phases expelled from kitchens, and the controls exerted by hydrodynamics and capillarity on migration from source bed to trap/reservoir
- Describe a trap in terms of the critical weak points on its edges
- Estimate column heights containable by these edges
- Understand the Petroleum System controls on reservoir rock quality
- Understand reservoir and reservoir fluid properties that govern deliverability, well recovery, and economics (rate, product value)

**Production Geology for Other Disciplines – PGD**

FOUNDATION 5-Day

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

**DESIGNED FOR**
Production/completion/reservoir engineers, financial staff, professional staff from disciplines other than geology, and managers involved with reservoir management, and development/ production, who might require an understanding of geological data, its variability, and the effects of the data, and its interpretation, on their projects and jobs. This course is also appropriate for geologists early in their career development that need an introduction to reservoir development or production 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 paleo-environmental interpretations and the practical application of these interpretations to field development
- Recognize and appreciate uncertainty in geological and geophysical data/interpretation
- Understand the uncertainty surrounding the geologist’s interpretation
- Recognize ways in which geological data is presented for evaluation in integrated asset teams
- Understand and more realistically evaluate geological and geophysical data and interpretation
- Understand geological interpretation impact on production and development...pro and con

**COURO CONTENT**
Correlation and stratigraphy • Structural interpretation • Seismology • Clastic/carbonate deposition including an introduction to Unconventional Reservoirs • Reservoir geology reservoir characterization and modeling • Volumes • Well planning • Reservoir appraisal • Field development • Uncertainty analysis

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>10-14 SEPT 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>12-16 OCT 2018</td>
<td>$4225</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>18-22 MAY 2019</td>
<td>$5070</td>
</tr>
<tr>
<td>MELBOURNE, AU</td>
<td>1-5 APR 2019</td>
<td>$4270</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>10-14 JUNE 2019</td>
<td>$4325</td>
</tr>
</tbody>
</table>
Sequence Stratigraphy: An Applied Workshop – SQS

FOUNDATION 5-Day FIELD TRIP

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Identify unconformities and sequence boundaries
• Identify paraeconomics and use in correlation
• Identify inclined valleys
• Visualize and interpret deep water fans and their geometries
• Recognize seismic signatures of deep water deposits
• Relate sequence stratigraphy to basin architecture and relative sea level
• Build predictive stratigraphic models
• Utilize sequence stratigraphy to develop exploration/production strategies

COURSE CONTENT

Seismic geometries • Unconformities • Relative sea level • Eustasy • Parasequences and their stacking patterns • Parasequences as a correlation tool • Relationship of stratigraphic patterns to changes in subsidence rates as driven by regional and earth scale tectonic processes • Cycle hierarchy • World-wide cycle chart and its application • The sequence stratigraphic model • LST sequence boundaries, incised valleys, slope fans, basin floor fans, and prograding complexes • TST incised valley fill, source rock and reservoir seal • HST alluvial, deltaic, shoreline complexes and incised valley fill, source rock and reservoir seal • Use restoration and balance to validate an interpretation and show the structural evolution

Analysis of Structural Traps in Extensional Settings – ESS

INTERMEDIATE 5-Day FIELD TRIP

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

DESIGNED FOR

Exploration geologists, geophysicists, engineers, and geoscience managers.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Comparative structural geology • Structural styles and patterns • Sensitivity analysis • Structural restoration and stratigraphic mapping • Folding vs. faulting • Palinspastic restoration of cross sections • Structural validation criteria • Sequential restoration and growth history • Regional architecture of basins • Compaction and subsidence solution • Wrench faults: simple, convergent, and divergent • Conjugate and dominant-style strike-slip regimes • Thin-skinned fold-thrust belts • Fault-related folds • Duplexes • Basement-involved contraction • Vertical and rotational block uplifts • Inversion: dip-slip to strike-slip • Thin-skinned extension • Basin-involved extension • Full graben and full graben rift systems • Domain-style extension • Diapirs • Salt sheets • Reverse and contour-parallel pseudotensional fault systems • Plate-tectonic habitus of structural assemblages • Tectonic synthesis and exploration project

EXPLORATION geology, geophysicists, biostratigraphers, and engineers.

YOU WILL LEARN HOW TO

• Distinguish the characteristics of extensional and transtensional traps
• Rank and quantify petroleum system risk
• Relate structure to potential trap geometries

COURSE CONTENT

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

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Compositional and Transpressional Structural Styles – CPST

INTERMEDIATE 5-Day

Compositional and transpressional structures provide some of the world’s largest known hydrocarbon reservoirs and remain major frontier plays. 3D seismic has revolutionized structural mapping, but making the most realistic geologic interpretation of these structures requires an ability to recognize and exploit the fundamental forms. This course presents outcrops, subsurface, seismic sections, and model analogs that provide structural interpretation in a wide range of compositional and transpressional environments. Interpretations are validated by restoration and by comparison to balanced models. This course covers the latest restoration techniques and the use of the predictive kinematic models for thrust-fold belts.

DEIGNED FOR

Geologists, geophysicists, engineers, and managers responsible for the interpretation and drilling of compressive and transpressive structures.

YOU WILL LEARN HOW TO

• Distiguish the characteristics of compositional and transpressional deformation including distinguishing thin-skinned and basement-involved styles
• Identify the fundamental characteristics of the wrench assembly
• Use the area-depth relationship to validate cross sections and predict sub-resolution structures
• Apply mechanical-stratigraphic principles to predict the formation and evolution of structures
• Apply restoration, and balancing techniques

• Predict structural geometry from sparse or inconsistent data using kinematic models

• Recognize typical oil-field locations and geometries in compositional and transpressional structures

Course content

Compositional structural styles and their plate-tectonic habitats • Wrench assembly • Transpressive structures • Detached (thin-skinned) styles including forearc, backarc, collisional, and deep-water thrust-fold belts • Basement-involved styles including compressional drape folds, predictive models for rotated blocks, and subthrust plains • Inversion • Structural validation criteria • Selecting the best balancing and restoration technique • Flaxural-slip restoration • Area-depth technique for section validation, depth to detachment, bend-length changes, and fault prediction • Fault-bend folds • Fault-tip folds • Fault-propagation folds • Detachment folds • Buckle folds and the break-fold model • Duplexes • Triangle zones • Growth folds • Fracturing in compositional structures • Summary of oil and gas fields

Deep-water Turbidite Depositional Systems and Reservoirs – DWT

INTERMEDIATE 5-Day

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of iteration of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow deposits and processes in modern and ancient cases. Participants will learn the importance of modifying development plans as a field becomes more mature. Techniques for mature field rejuvenation are discussed through case histories.

DEIGNED FOR

Geologists, geophysicists, engineers, and experienced technicians.

YOU WILL LEARN HOW TO

• Identify the characteristics of the wrench assembly
• Identify the fundamental characteristics of the inversion structures
• Use the area-depth relationship to validate cross sections and predict sub-resolution structures
• Apply mechanical-stratigraphic principles to predict the formation and evolution of structures
• Use restoration, and balancing techniques
• Predict structural geometry from sparse or inconsistent data using kinematic models

• Recognize typical oil-field locations and geometries in compositional and transpressional structures

Course content

Compositional structural styles and their plate-tectonic habitats • Wrench assembly • Transpressive structures • Detached (thin-skinned) styles including forearc, backarc, collisional, and deep-water thrust-fold belts • Basement-involved styles including compressional drape folds, predictive models for rotated blocks, and subthrust plains • Inversion • Structural validation criteria • Selecting the best balancing and restoration technique • Flaxural-slip restoration • Area-depth technique for section validation, depth to detachment, bend-length changes, and fault prediction • Fault-bend folds • Fault-tip folds • Fault-propagation folds • Detachment folds • Buckle folds and the break-fold model • Duplexes • Triangle zones • Growth folds • Fracturing in compositional structures • Summary of oil and gas fields

Development Geology – DG

INTERMEDIATE 5-Day

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

DEIGNED FOR

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

YOU WILL LEARN HOW TO

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

Course content

Characteristics that impact field development • Determining recoverable hydrocarbons • Reservoir fluid properties • Influence of capillarity reservoirs • Volumetric reserve estimation and calculation • Stratigraphic influence on production • Controls on reservoir rock, barriers, and hydrocarbon distribution • Describing reservoir rock in carbonate and clastic rocks • Determining recoverable hydrocarbons • The impact of drive mechanism • Seismic applications • Development drilling • Optimizing hydrocarbon recovery • Economic impact on field development • Subdividing the reservoir into working units • Reservoir pore space configurations • Building a static reservoir model using deterministic and stochastic techniques • Key factors affecting the development of fractured reservoirs • Impact on barriers on field development • Secondary and tertiary field development • Rejuvenating old marginal fields

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

INTERMEDIATE 5-Day

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

DEIGNED FOR

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

YOU WILL LEARN HOW TO

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

Course content

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

INTERMEDIATE 5-Day

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

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

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

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

Operations Geology – OG

INTERMEDIATE 5-Day

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

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

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

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

Prospect and Play Assessment – PPA

INTERMEDIATE 5-Day

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

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

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

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

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

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

COURSE CONTENT
Characterization of natural fractures and fracture systems • Influence of mechanical stratigraphy and structure on fracture development • Detection and prediction of subsurface natural-fracture occurrence and intensity from cores and well logs • Fractured rock properties affecting reservoir performance • Classification of naturally-fractured reservoirs with reservoir examples and potential production problems • Naturally-fractured reservoirs: fluid-flow, well performance and well testing, reservoir performance, numerical simulation • Geomechanics/Fluid-flow • Behavior and stimulation of naturally-fractured reservoirs • Effects of natural fractures on reservoir permeability, anisotropy, drainage area, and waterflood sweep efficiency
The Course Progression Matrix below shows how the Geophysics courses in this section are structured within each topic, from Basic to Specialized. On either side of the Geophysics 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.

The first two courses in this section, **Basic Geophysics – BGP** and **Seismic Interpretation – SI1**, are two of our most popular and build the foundation of the discipline. For unconventional plays, be sure to check out **Use of Full Azimuth Seismic and Microseismic for Unconventional Plays – FAMS** on page 17. Also, be sure to take a look at our new course, **Advanced Practices in Exploration and Development of Unconventional Resources – EDUR**, on page 16.

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

- Mr. Peter Bartok
- Mr. Bob Brune
- Mr. Satinder Chopra
- Ms. Nancy House
- Mr. John Logel
- Dr. Heloise Lynn
- Dr. Walter Lynn
- Dr. Ken Mahrer
- Dr. David Muerder
- Dr. John Pigott
- Dr. Tom Temples

### Geophysics Course Progression Matrix

<table>
<thead>
<tr>
<th>Geology</th>
<th>Geophysics</th>
<th>Petrophysics</th>
<th>Reservoir, Production and Drilling</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOUNDATION</strong></td>
<td><strong>BASIC</strong></td>
<td><strong>INTERMEDIATE</strong></td>
<td><strong>SPECIALIZED</strong></td>
</tr>
<tr>
<td>Basic Petroleum Geology (p. 9)</td>
<td><strong>Geological and Geophysical Characterization of HHW Oil Reservoirs</strong> (p. 9)</td>
<td><strong>Basic Geophysics</strong> (p. 15)</td>
<td><strong>Basic Petroleum Technology Principles</strong> (p. 9)</td>
</tr>
<tr>
<td><strong>Acquisition and Processing</strong></td>
<td><strong>General Seismic Interpretation</strong></td>
<td><strong>Seismic Stratigraphic Interpretation</strong></td>
<td><strong>Borehole and Non-Seismic Geophysics</strong></td>
</tr>
<tr>
<td><strong>Seismic Attributes for Resource Characterization</strong> (p. 17)</td>
<td><strong>Applied Seismic Attribute for Predicting Rock Properties</strong> (p. 17)</td>
<td><strong>Advanced Seismic Stratigraphy</strong> (p. 17)</td>
<td><strong>Applied Rock Mechanics</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Seismic Interpretation</strong></td>
<td><strong>Seismic Velocities and Depth Conversion</strong> (p. 15)</td>
<td><strong>Seismic Interpretation of Different Structural Styles</strong> (p. 14)</td>
<td><strong>Reservoir Characterization</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td><strong>Seismic Imaging of Subsurface Geology</strong> (p. 15)</td>
<td><strong>Seismic Interpretation</strong></td>
<td><strong>Well Log Interpretation</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Seismic Inversion and Attribute Principles and Applications</strong> (p. 16)</td>
<td><strong>Seismic Inversion</strong></td>
<td><strong>Inversion and Attribute Principles and Applications</strong> (p. 26)</td>
<td><strong>Preparation for Other disciplines</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Data Acquisition and Processing</strong></td>
<td><strong>Seismic Inversion</strong></td>
<td><strong>MAPPING</strong></td>
<td><strong>Migration</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Project and Play Assessment</strong> (p. 13)</td>
<td><strong>Seismic Inversion and Attribute Principles and Applications</strong> (p. 16)</td>
<td><strong>Interpretation</strong></td>
<td><strong>Preparation for other disciplines</strong> (p. 26)</td>
</tr>
<tr>
<td><strong>Reservoir Characterization</strong> (p. 13)</td>
<td><strong>Mapping Seismic Structures</strong> (p. 28)</td>
<td><strong>MAPPING</strong> (p. 28)</td>
<td><strong>Seismic Imaging for Other Disciplines</strong> (p. 26)</td>
</tr>
</tbody>
</table>

**You Will Learn How To**

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

**Course Content**

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

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

- **Calgary, Canada:** 17-21 June 2019, $4270+GST
- **Houston, USA:** 25-29 March 2019, $4325
- **Kuala Lumpur, Malaysia:** 23-27 Sept 2019, $3220
- **London, UK:** 5-9 Nov 2018, $4985+VAT
- **London, UK:** 18-22 Nov 2019, $5035+VAT
Basic Geophysics – BGP

BASIC 5-Day

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

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

YOU WILL LEARN
• How seismic data represent subsurface rock parameters including the relative structure, lithology, and pore filling material
• How land and marine seismic data are acquired and processed to produce both two- and three-dimensional seismic images
• The variables that define rock properties including pore filling material, pore pressure, water saturation, and fracture orientation
• How to value developments through time-lapse seismic surveys for reservoir monitoring purposes

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

PETROSKILLS.COM/BLENDED-BGP

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

23 APR - 19 JUN 2019  $4325
18 JUN - 14 AUG 2019  $4325
10 SEP - 6 NOV 2019  $4325

Seismic Acquisition Technology in a Regulatory Era – SATR

FOUNDATION 5-Day

Around the world, we are in an age of increasingly more stringent challenges for seismic acquisition to meet regulatory requirements. Meanwhile, the acquisition of geophysical data has become increasingly more diverse, with a broad range of operational practices and technologies utilized. Regulatory and environmental issues are assuming a key driving role in seismic source design, in source strength, in footprint/impact of surveys, and other ways. To meet evolving requirements, creative new technologies and practices will be needed. There are a number of highlights in current seismic acquisition technology trends.

This course provides the broad technical background for these highlights, and for the creative design of surveys to proactively address regulatory and environmental requirements. Participants are encouraged to bring along information and questions regarding any special or unusual surveys from their experience.

DESIGNED FOR
Geophysicists who work in seismic acquisition, seismic interpreters, seismic processors, engineers with involvement/interest in seismic surveys, and the full scope of E&P staff with interest in seismic acquisition and HSE issues.

YOU WILL LEARN HOW TO
• Describe technology concepts behind the full scope of different types of surveys acquired today
• Recognize the many interwoven technical and operational factors in successfully designing and executing surveys, with an emphasis on the diversity and different parameters used
• Understand commercial, regulatory, and environmental issues, allowing participants to undertake an advocacy role in dealing with these increasingly more important issues
• Understand the many challenges and risk factors that come into play while successfully acquiring data of optimal value for E&P

COURSE CONTENT
• Land sources, receivers, recording systems, survey design, noise, multicomponent, HSE, and permitting
• Marine sources, streamers, recording, vessels, survey designs, HSE issues
• Transition zone and ocean bottom seismic
• Ancillary topics such as navigation, geodesy, mapping, data storage, selected wave propagation topics
• Specialty surveys such as high-resolution site surveys, micro-seismic, 4D, downhole seismic, and permanent reservoir monitoring
• Commercial, regulatory, and environmental issues

Seismic Imaging of Subsurface Geology – SSD

FOUNDATION 5-Day

Basic seismic imaging principles and techniques are introduced at the outset of the class to establish the purpose, underlying principles, parameterization, and limitations of the various processing steps leading to final seismic images provided by current state-of-the-art imaging techniques. The course focuses on 3D seismic data. By the end of the course, the participant will understand how seismic acquisition and data processing steps affect seismic amplitudes to assess their validity as input to various post-imaging seismic attribute and inversion processes.

DESIGNED FOR
Seismic interpreters, geophysicists, geologists, and exploration team members who use seismic data and need to understand the purpose and implications of the data acquisition and processing steps that lead to the final seismic images and derivative attributes. Also, the course is appropriate to early-career processing geophysicists seeking a rigorous foundation of the principles of data processing and seismic imaging.

YOU WILL LEARN HOW TO
• Assess and determine data processing flows for a variety of acquisition and reservoir scenarios
• Determine the most cost-effective imaging or migration technique given acquisition and structural scenarios
• Recognize various noises and how best to mitigate them
• Assess and appreciate the sensitivity of data processing parameters on final images
• Estimate the vertical and lateral resolution of the processing and attribute products
• Understand data acquisition and processing quality control displays
• Ask appropriate questions during data processing steps
• Communicate effectively with specialists in seismic data acquisition, processing, and interpretation
• Appreciate and evaluate the trade-offs between costs, turn-around time, and sophistication of processing and imaging steps

COURSE CONTENT
Review of basics of reflection seismology: wave propagation and seismic amplitudes • Seismic imaging techniques and principles • Overview of 3D seismic data acquisition and quality control • Improving seismic resolution: deconvolution, inverse-G filtering, and spectral whitening • Velocity estimation, velocity field building, and velocity uncertainty implications • Near-surface problems and solutions: seismic datums and static corrections • Noise identification and suppression: coherent noises, multiples, linear noises, and incoherent noises • Advanced seismic imaging techniques: pre-stack time and pre-stack depth migration • Migration velocity analysis techniques

2018-19 Schedule and Tuition (USD)

BAKERSFIELD, US 10-14 JUN 2019  $4170
DENVER, US 11-15 MAR 2019  $4220
HOUSTON, US 26-30 NOV 2018  $4140
29 APR-3 MAY 2019  $4225
BAKERSFIELD, US 10-14 JUN 2019  $4170
18-22 NOV 2019  $4225
LONDON, UK 24-28 JUN 2019  $4350+VAT

See website for dates and locations.

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500  |  petroskills.com  |  +1.800.821.5933 (toll free North America)
Seismic Velocities and Depth Conversion – SVDC

**FOUNDRATION 5-Day**

This course will teach you how to use velocity information and structural inputs to build a consistent velocity model and/or calibrate ones that have been created during seismic data processing. This class is designed for the interpreter so that he or she understands the theory and practice of how to estimate depths from older time-migrated data, as well as how to quality control (QC) and calibrate newer PSDM data. Also covered is the process of converting seismic data from time to depth. This is a foundation level course. It is neither designed nor paced for the experienced velocity modeler or processor.

**DESIGNED FOR**

Early-career geoscientists and engineers, especially seismic interpreters, and anyone who needs to understand the basic theory and procedures for creating velocity models and converting seismic data from time to depth.

**YOU WILL LEARN HOW TO**

- Understand the various types of velocities, their calculation, and the validity of their interpretation and extrapolation
- Compare, quality control, smooth, and combine the various velocity types into an integrated velocity model
- Validate model quality by examining the changes in velocity needed to tie the seismic model to the borehole
- Use the model to convert horizons, faults, and seismic data from time to depth
- Understand an introductory-level, how velocity models are used for other studies such as forward modeling and pore-pressure prediction

**COURSE CONTENT**

**Velocity:** definition and comparison of the many types of velocities including average, interval, RMS, stacking, migration, P-wave, and S-wave

**Velocity Inputs:** accuracy and regional extent of each, including check shots, VSPs, sonic logs, time/depth functions, well picks and pseudo velocities, seismic velocities, and horizons for structural control

**Synthetic Seismograms:** creation, upsampling, and tying to seismic data.

Advanced synthetics including synthetic gather creation, Zoeppritz equations, AAR, and AVO

**Matching Synthetics to Seismic:** calibrating the seismic data to the well data.

**Velocity Velocities:** semblance analysis, velocity picking, multiples, and how seismic velocities differ from well velocities

**Migration and Migration Velocities:** introduction to pre- and post-stack algorithms, tomography, and iterative velocity analysis

**Velocity Model Building:** workflows to integrate stacking velocities, time/depth curves, well picks associated with seismic horizons (pseudo-velocities), and structure from horizons

**Time-to-Depth Conversions:** vertical stretch, inverse of stacking, migration, and uncertainty

**Introduction to Advanced Topics:** anisotropy, pore-pressure prediction, geostatistics, and forward modeling

---

<table>
<thead>
<tr>
<th>2018-19 Schedule and Tuition (USD)</th>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUBAI, UAE</strong>&lt;br&gt;9-13 DEC 2018</td>
<td><strong>DUBAI, UAE</strong>&lt;br&gt;9-13 DEC 2018</td>
</tr>
<tr>
<td><strong>$5340+VAT</strong></td>
<td><strong>$5440+VAT</strong></td>
</tr>
<tr>
<td><strong>6-10 MAY 2019</strong></td>
<td><strong>6-10 MAY 2019</strong></td>
</tr>
<tr>
<td><strong>$4325</strong></td>
<td><strong>$4325</strong></td>
</tr>
<tr>
<td><strong>KUALA LUMPUR, MYS</strong>&lt;br&gt;22-26 OCT 2018</td>
<td><strong>KUALA LUMPUR, MYS</strong>&lt;br&gt;22-26 OCT 2018</td>
</tr>
<tr>
<td><strong>$5070</strong></td>
<td><strong>$5070</strong></td>
</tr>
<tr>
<td><strong>LONDON, UK</strong>&lt;br&gt;3-7 SEP 2018</td>
<td><strong>LONDON, UK</strong>&lt;br&gt;3-7 SEP 2018</td>
</tr>
<tr>
<td><strong>$4890+VAT</strong></td>
<td><strong>$4890+VAT</strong></td>
</tr>
</tbody>
</table>

---

Advanced Practices in Exploration and Development of Unconventional Resources – EDUR

**INTERMEDIATE 5-Day NEW**

In this course, participants will learn and practice the techniques used by various disciplines to evaluate unconventional resources. The objective is to understand the significance and limits of the various tools in order to optimize integration, improve communication, and allow for greater efficiency in follow-up projects. In addition to covering the techniques, many of the exercises and problems use data from active producing unconventional basins. Several spreadsheets are provided to allow for quick look reviews.

**DESIGNED FOR**

Geoscientists, engineers, and managers who need an enhanced understanding of assessment techniques for unconventional resources and how to integrate them.

**YOU WILL LEARN HOW TO**

- How to use engineering and geoscience methods to analyze unconventional well data
- To reduce risk by understanding the strengths and limitations of various assessment tools
- How to effectively collect and integrate data from multiple sources
- The essential functions of each key discipline in order to become a valuable member of the integrated team, contributing and communicating effectively

**COURSE CONTENT**

Introduction to shale classification, mineralogy, physical and chemical attributes • Determining porosity, permeability, and water saturation in unconventional reservoirs • Biostratigraphy, sequence stratigraphy, and anoxic in unconventional reservoirs • Petrophysical and geophysical techniques in unconventional reservoirs • Rock physics and brittleness • Geochemistry, kerogen typing, thermal effects, and reserve estimation • Physical parameters affecting unconventional resources: capillary properties, pressure, seal capacity, etc. • Using global and regional stress maps • Application of the Mohr circle • Determination of fract parameters • Leak-Off Test (Minifract) and microseismic • Water disposal and aquifer contamination • Economic evaluation of unconventional reservoirs • Volumetric assessment considering free and adsorbed gas • Risk assessment, common risk segment (CRS) analysis

---

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

**INTERMEDIATE 5-Day**

The subject of direct hydrocarbon indicators and AVO has rapidly expanded to include AVO inversion, offset AVO inversion, and 4D AVO inversion. A significant part of the course deals with rock physics as it relates to the other topics in the course. Further insight into the seismic data is supplied by looking at seismic attributes. The technology has provided the interpreter with a very new and exciting package of tools that allow us to be truly representative of both the rock properties and the pore filling material. This course is intended to provide the users with a clear and useable understanding of the current state of these technologies. The focus of the course is on both understanding and application.

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

Seismic fundamentals as they relate to defining the appearance of hydrocarbons in the data

An inventory of direct hydrocarbon indicators, including AVO • Risk rating prospects that display AVO anomalies • Understanding rock properties and the effect of pore filling material • AVO and how it relates to the typical production zones around the world with various ages and depths of burial • Various methods of displaying AVO effects in the seismic data

Acquisition and processing considerations to display hydrocarbon anomalies as a pore filling material • Various approaches to seismic modeling and fluid replacement • Rock properties and pore filling material from seismic inversion • Spectral decomposition and seismic attributes as other ways of extracting reservoir information from the seismic image • Methods of combining attributes as they relate to prospectivity

---

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

**INTERMEDIATE 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

- Apply geophysical fundamentals to uncovering the geological information embedded within seismic data
- Understand the premises behind the Vail sequence paradigm
- Construct and interpret chronostratigraphic charts, sea level curves, and seismic facies maps
- Interpret elastic and cationic depositional systems in terms of changes and autogenic processes and the effects upon reservoir architecture and seal potential
- Systematically reconstruct a basin’s geohistory which provides the critical foundation for its petroleum system analysis and effective exploration

**COURSE CONTENT**

Introduction: the philosophy of history • Geophysical fundamentals • Breaking out operational sequences • Introduction to fault interpretation • Chronostratigraphy construction and interpretation • Sea level curves, accumulation of organic reservoirs, and cycle orders • Vail sequence theory and sequence hierarchy • Carbonate sequences • Siliciclastic sequences • Seismic facies • Paleo-environmental analysis • Geohistory reconstruction • Optimizing exploration

---

2018-2019 Schedule and Tuition (USD)

**DURHAM, US** 22-26 APR 2019<br>$4700<br>26-30 NOV 2018<br>$4820 **HOUSTON, US** 9-13 DEC 2018<br>$5440+VAT<br>6-10 MAY 2019<br>$4325 **KUALA LUMPUR, MYS**<br>22-26 OCT 2018<br>$5070 **LONDON, UK**<br>3-7 SEP 2018<br>$4890+VAT

**HOUSTON, US** 24-28 SEP 2018<br>$4190<br>21-25 OCT 2018<br>$4250 **KUALA LUMPUR, MYS**<br>20 JUL – 2 Aug 2019<br>$4070 **LONDON, UK**<br>24-28 JUNE 2019<br>$5235+VAT
Geophysics 17

Advanced Seismic Stratigraphy – A Sequence – Wavelet Analysis Exploration – Exploitation Workshop – ADS

3-Day

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

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

You will learn how to: Evaluate rock-fluid information from wavelet analysis (frequency, velocity, Q, seismic attributes, and AVO). Understand the strengths and weaknesses of geovisualization using and misusing synthetics, seismic inversion, and VSP. Determine fault mechanical stratigraphy through proper interpretation of fault imaging. Understand the differences, weaknesses, and strengths of both the Vail with the Galloway sequence paradigms and when to optimally employ them. Develop seismic level curves from micropaleontology. Construct detailed seismic facies maps and understand their relationship to Walter’s law. Classify deltas based upon their seismic characteristics. Differentiate basin floor fan facies and parasequence sets. Interpret clastic and carbonate depositional systems responses to allochtyic and autochthony processes and the effects upon reservoir architecture and seal potential. Optimally interpret parasequence set fairways for exploration. Geoscientifically characterize reservoirs for optimizing development.


Applied Seismic Anisotropy for Fractured Reservoir Characterization – ASAF

5-Day

This course is designed to enable you to perform professional geophysical work to evaluate fractured reservoirs and/or reservoirs that require hydraulic fracturing to produce. The emphasis of the lectures is on improving the participants’ work assignments. Field data case histories and laboratory data illustrate the principles and practices of calibrating azimuthal travel times and azimuthal prestack amplitudes against independent measurements of in-situ horizontal stresses, and natural fractures that flow fluids. The course covers acquisition design and Q/C, azimuthal processing, interpretation, and modeling to test different interpretations. The skills that you will learn also involve integrating the support data - well logs, production testing, VSP, core work - with your reflection seismic data. This includes identifying the effects of the two types of seismic anisotropy on seismic data. You will learn how to employ anisotropy to accomplish your reservoir-related goals. Seismic anisotropy is everywhere in the layered sedimentary rocks, but in the past, geophysicists have often ignored it, sometimes because they didn’t understand the data that reveal its presence, and other times because they didn’t understand the benefits that properly recorded and processed anisotropics data provide. The class is usually designed as lectures in the morning, with field data analysis in the afternoons. If the course is taught as an in-house course, with your own properly acquired and properly processed 3D data, then software applications useful for fractured reservoir analysis will be used during the class.

Designed for Geophysicists, geologists, and explorationists assigned to evaluate fractured reservoirs or reservoirs requiring hydraulic fracturing to produce.

You will learn how to: Ask necessary geotechnical questions about your reservoir and play. Identify the geophysical data needed to answer those questions; design acquisition and processing procedures; qualify-check during processing; interpret the final processed data; model different interpretations. Identify the support data required for successful fracture / in-situ stress analysis. Recognize seismic anisotropy, its causes, and what happens to projects that ignore ubiquitous anisotropy. Identify the two types of seismic anisotropy, and how each appears in seismic data. Use anisotropy for your benefit. Classic analysis of azimuthal anisotropy requires seismic reflectors, that is, your reservoir must have a hand-held calculator to class.

The Course Progression Matrix below shows how the Well Construction/Drilling courses in this section are structured within each topic, from Basic to Specialized. On either side of the Well Construction/Drilling section, you will see courses in associated disciplines for cross-training.

The first two courses in this section are two of our most popular and build the foundation of the discipline. Basic Drilling Technology — BDT provides a basic overview of the drilling process, while Well Design and Engineering — WDE on page 19 integrates all major well design technologies. If you need to build a foundation around directional and horizontal wells, be sure to see Directional, Horizontal, and Multilateral Drilling — DHD on page 21. Also, be sure to check out our exciting deepwater course: Deepwater Well Engineering — DWE on page 21.

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

Mr. Peter Aird
Mr. George Amstead
Mr. James Boro
Mr. Jerry Calvert

Mr. Richard Carden
Mr. Kevin Cutler
Mr. Mark Hackler
Mr. Aaron Klein

Mr. Steve McKee
Mr. Steve McCall
Mr. Hector Moreno
Dr. Leon Robinson

Mr. Steve Metz
Mr. Marc Summers
Mr. Bob Westmark

Mr. Larry Wolfer
Mr. Dee Wright

Mr. Aron Klein
Mr. Mark Hackler
Mr. Kevin Cuyler
Mr. Richard Carden

Mr. Hector Moreno
Mr. Marc Summers
Mr. Bob Westmark

Dr. Leon Robinson
Mr. Hector Moreno
Mr. Marc Summers
Mr. Bob Westmark

Mr. BoB Westmar
Mr. MArC Summers
Dr. SuBhAsh ShAh
Dr. don Schmid

Mr. diCk Wright

Mr. diCk wriGht

Mr. Steve MCkeever

Mr. diCk wriGht
Casing and Cementing - CAC

BASIC 5-Day
This course builds a firm foundation in the principles and practices of designing, planning, and conducting successful casing and cement jobs. The course uses a process-based perspective that takes participants from initial casing depth and size selection, casing and liner design procedures, casing running practices, and planning and executing primary cementing through remedial cementing and plugback operations. In addition to the necessary technical information and procedures, the course is laced with considerable practical, experience-based content. Participants will be furnished Dr. Byrom’s textbook, “Casing and Liners for Drilling and Completion,” and computer spreadsheets to facilitate routine calculations.

DESIGNED FOR
Personnel responsible for planning, overseeing, and conducting casing and cementing operations; operator and service personnel.

YOU WILL LEARN
• Selection of casing sizes and setting depths to achieve well objectives
• Determination of casing loads for design purposes
• To design casing properties to meet burst, collapse, and tensile strength requirements
• To conduct casing running operations safely and successfully
• Specification of cement slurry properties and volumes to meet well objectives
• Determination of best procedures for attaining successful primary cementing
• To conduct stage jobs, squeeze jobs, and set cement plugs

COURSE CONTENT
Selecting casing and hole sizes • Setting depths • Casing loads • Selecting casing and connections • Casing stress calculations • Cement and cement additives • Selecting appropriate slurries • Mud removal and cement placement • Stage cementing, squeezes, and plugs • Preventing gas migration • Cementing placement • Stage cementing, squeezes, and cementing and cement additives • Selecting connections • Casing stress calculations • To conduct casing running operations safely and successfully

Well Design and Engineering – WDE

FOUNDATION 10-Day
Well Design and Engineering integrates all major well design technologies from pre-spool to TD. Participants are actively engaged in every aspect of the technical activities required to deliver a cost-effective well plan while also gaining valuable perspective on how the overall process should be managed in a dynamic team environment. The workshop content is often customized to address technologies and practices that may be specific to a project or operational situation. The single most important goal of the workshop is to draw the linkages between the design topics and to leave the participants with an understanding that each decision has influence on those that follow. Intensity mounts as the course progresses and each design topic builds on those that came before. Design iterations are commonly required, and seemingly unrelated decisions push teams into situations of uncomfortable operational risk. On the last day, each team present their completed design before the class and an invited panel of industry professionals. A scientific calculator is required and a laptop computer is strongly recommended.

DESIGNED FOR
Casing engineers, completion engineers, and drilling supervisors involved with drilling operations and well planning.

YOU WILL LEARN HOW TO
• Understand the responsibilities of a well planner as a designer and project manager
• Review offset analysis and data gathering
• Understand the influence of completion design and production requirements on well design
• Identify trajectory design issues and their influence on torque and drag, wellbore stability, and future intervention
• Develop specific casing design skills including casing point selection; design load case development; burst, collapse and tension calculations; controlling load and safety factor determination and select appropriate size, weight and grade
• Perform cement slurry and displacement volume calculations
• Complete drill string and BHA designs and failure prevention assessment for each hole section, and review for directional well performance
• Understand different bit types and applications, and perform calculations to support bit run economics
• Optimize hydraulics for each hole interval based upon wellbore fluids, and drill string configurations
• Compiles risks to well delivery, and develop mitigations and contingency plans
• Develop minimum rig capability specifications to deliver well requirements
• Present and defend a well plan to management

Drilling Fluids Technology – DFT

FOUNDATION 5-Day
This course is designed for engineers and field personnel involved in the planning and implementation of drilling programs. The seminar covers all aspects of drilling fluids technology, emphasizing both theory and practical application. Hands-on laboratory exercises are included in the five-day Houston sessions. Drilling is a complex operation requiring the marriage of different technologies and disciplines. Today’s drilling personnel must have a working knowledge of all these disciplines in order to effectively drill a well. The course provides all the fundamentals necessary to drill a well whether it is a shallow well or a complex, high pressure well. This course is valuable for anyone who needs to understand the fundamental aspects of drilling fluids.

DESIGNED FOR
Drilling supervisors, drilling engineers, toolpushers, managers, and technical support personnel involved with drilling operations.

YOU WILL LEARN HOW TO
• Use clays and polymers to achieve desired mud properties
• Apply water chemistry to the treatment of drilling fluids
• Perform complete water-based fluid as well as non-aqueous fluid tests using API Recommended Practice 13B/ISO 10414-1*
• Evaluate and apply the results of an API drilling fluids report to maximize drilling operations and minimize non-productive time
• Identify critical drilling fluid contaminants and prescribe corrective treatments for effective drilling fluid management
• Calculate the chloride concentration of the drilling fluid in order to maintain wellbore stability
• Select non-aqueous fluids to meet drilling requirements and environmental concerns
• Manage non-aqueous drilling fluid systems
• Minimize formation damage to optimize well productivity
• Evaluate options for drilling fluid waste management

COURSE CONTENT
Composition and properties of water-based drilling fluids • Analysis of API water-base mud and non-aqueous drilling fluid report • Identification and treatment of drilling fluid contaminants • Composition and properties of water-based and non-aqueous drilling fluid systems • Selection of water phase salinity for borehole stability • API water-based and non-aqueous drilling mud tests • Adjustment of non-aqueous drilling fluid properties • Managing invert emulsion fluid systems: rig preparation and displacement • Non-aqueous drilling fluids designed for environmental compliance

*Based on laboratory availability

Drilling Practices – DP

FOUNDATION 10-Day
The two-week course is designed for engineers and field personnel involved in the planning and implementation of drilling programs. The seminar covers all aspects of drilling technology, emphasizing both theory and practical application. Drilling is a complex operation requiring the marriage of different technologies and disciplines. Today’s drilling personnel must have a working knowledge of all these disciplines in order to effectively drill a well. The course provides all the fundamentals necessary to drill a well whether it is a shallow well or a complex, high pressure well. Computer programs are used to design many aspects of the modern well and the course will provide the participants with the theory behind most programs along with practical implementation. Participants are required to bring a scientific calculator. For in-house courses, the instructors of this course will accept examples from your company for analysis as one of the demonstration exercises. Please contact PetroSkills Training for a list of the information and support data required, as well as the necessary load-time.

DESIGNED FOR
Drilling supervisors, drilling engineers, toolpushers, managers and technical support personnel.

YOU WILL LEARN HOW TO
• Review drilling data and plan the well
• Incorporate completion plans into the drilling plan
• Drill a well cost effectively and maximize penetration rate
• Evaluate stuck pipe problems and avoid potential problems
• Evaluate and maintain drilling fluids
• Optimize hole cleaning
• Design casing, drill string and BOP/wellheads
• Evaluate and implement cementing programs
• Design and implement bit and hydraulics programs
• Incorporate directional drilling and deviation control
• Recognize and evaluate well control problems

COURSE CONTENT
Planning including requirements for the completion and testing, AFE preparation • HSE at the rig site • Cost control, evaluating alternative drilling methods and maximizing penetration rate • Hole cleaning, sloughing shale, lost circulation, stuck pipe and fishing operations • Drilling fluids • Lifting capacity of drilling fluids, pressure losses in the circulating system and ECD • Maximizing hydratkins in the planning phase and at the rig • Bit selection and application • Casing and drill string design, selection of casing seats, BOP equipment • Cement, cement additives and displacement mechanics • Deviation control, directional drilling and horizontal drilling • Fracture control, routine and special problems • Project post analysis

2018-2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Registration Fee</th>
<th>VAT (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>12-16 NOV 2018</td>
<td>£5140+VAT</td>
<td>£5140+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>8-12 APR 2019</td>
<td>$4320</td>
<td>$4320</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>16-20 JUL 2019</td>
<td>$5760+VAT</td>
<td>$5760+VAT</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>15-19 OCT 2018</td>
<td>$4150</td>
<td>$4150</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>5-9 JUL 2019</td>
<td>£5285+VAT</td>
<td>£5285+VAT</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>4-8 MAR 2019</td>
<td>$5285+VAT</td>
<td>$5285+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>8-12 JUL 2019</td>
<td>£5990+VAT</td>
<td>£5990+VAT</td>
</tr>
</tbody>
</table>

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
***Fundamentals of Casing Design – FCD***

**FOUNDATION 5-Day**

Casing design is an integral part of a drilling engineer’s work scope. This course provides a comprehensive overview of the design process, emphasizing the working stress approach currently used in the industry. On completion of this course, successful participants will be able to select casing points, identify tubular requirements and loads, and design and specify the required casing string. Through a combination of lecture and extensive hands-on examples, the fundamentals of casing design are imparted to the attendees. Estimation of standard and special loads is covered in detail. Standard theories of strength and failure are discussed as well as advanced considerations for combined loads. In addition, safe handling, running, and hanging practices are covered. Participants will be furnished Dr. Byron’s textbook, “Casing and Liners for Drilling and Completion,” and computer spreadsheets to facilitate routine design calculations.

**DESIGNED FOR**

Drilling engineers, service personnel involved in developing well plans, and managers interested in learning about the well design process.

**YOU WILL LEARN HOW TO**

- Select casing setting depths based on pore and fracture pressure data as well as other criteria
- Determine casing and bit sizes, and alternatives for contingencies and special clearance situations
- Identify and define load cases to meet specific design requirements
- Apply standardized design factors to meet specific design requirements and identify the controlling design load for each string in the well
- Use and understand casing and connection specifications and select casing to satisfy the controlling design requirements
- Understand the limits of single load specifications and adjust the basic design for combined loading effects
- Design casing for high pressure fracturing in horizontal wells
- Apply practical safe handling, running, and hanging

**COURSE CONTENT**

- Goals of casing design
- Types of oilfield tubulars and connections
- Casing point selection and size determination
- Load estimation methods for casing and liners
- Typical design factors
- Theories of strength and failure (standard collapse, burst, axial; yield basis for combined loads)
- Design examples and exercises for all key loads and strings
- Casing handling, running, and hanging practices

---

***Casing Design Workshop – CDW***

**INTERMEDIATE**

Casing design is an integral part of a drilling engineer’s work scope. This workshop provides a comprehensive overview of the design process, emphasizing the working stress approach currently used in the industry. Upon completion, participants will be able to select casing points, identify tubular requirements, loads, and present a design which incorporates life cycle considerations. Estimation of standard and special loads is covered in detail. Standard theories of strength and failure are discussed as well as advanced considerations for combined loads. Topics related to safe handling, running and hanging practices will additionally be covered.

**DESIGNED FOR**

Engineers, site supervisors, and technical managers responsible for casing design and/or review of the casing design for the full life cycle of the well. Participants should have at least one year of drilling-related experience AND be in a role that requires that they perform a detailed casing design.

**YOU WILL LEARN HOW TO**

- Incorporate well objectives and offset data to assure wellbore integrity through its life cycle
- Incorporate risk mitigation strategies into well design
- Apply alternative design approach to address unanticipated torque/drag forces, etc.
- Conduct pre-job safety analysis and identify potential well control trouble spots
- Walk through key equipment and hazards associated with running, landing and cementing casing

**COURSE CONTENT**

- Introduction to casing design
- Select casing depth and sizes
- Calculate collapse and burst loads
- Make preliminary casing selection, adjust for axial loads
- Casing selection for collapse, burst, and axial design
- Calculate combined load effects, adjust and make final selection
- Final casing design with combined loads
- Additional load considerations
- Workshop wrap-up

---

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

Houston, US 19-23 Aug 2019 $4325

---

***Offshore Drilling Operations – ODO***

**FOUNDATION 3-Day**

This course is designed to familiarize personnel with unique aspects of offshore operations, structures, and vessels, and how drilling rigs interact with them over the life of an asset. All styles of rigs are analyzed, including bottom-supported and floating, mobile and fixed. Advantages and disadvantages of specific rig applications are considered when clarifying selection criteria, especially HSE performance, technical capabilities, and full-cycle efficiency.

**DESIGNED FOR**

Operator staff including engineering, geoscience, operations supervision and technical support, and HSE, drilling contractor rig crew and technical support personnel, and service company and logistics support personnel.

**YOU WILL LEARN HOW TO**

- Identify differences between onshore and offshore operations
- Clarify HSE and other risks associated with offshore operations (helicopter operations, boat operations, crane and deck operations, simultaneous operations, emergency response)
- Identify offshore structures commonly used in the oil and gas industry and their typical applications (bottom-supported or floating, fixed or mobile, moored or dynamically positioned, single use and multi-use structures)
- Identify various styles and designs of marine risers, subsea and surface BOPs, wellheads and trees
- Determine differences between various rig types and how they interact with offshore structures over the life of an asset (platforms, fixed, floating, semi-submersible, drillship)
- Identify operational effectiveness differences between various configurations of rig equipment, especially multiple activity centers
- Specify rig selection criteria
- Clarify logistical drivers for drilling and completion operations

**COURSE CONTENT**

- Surface and subsurface characteristics unique to the offshore environment
- HSE considerations for offshore and how it impacts planning, operations, and logistics
- Design options for offshore and onshore installations (platforms, FPSOs, risers, and pipelines; wellheads and trees; subsea; how these choices impact rig selection and project economics)
- Drilling rig styles (design capabilities, advantages and disadvantages, rig selection criteria, multiple activity centers to compress the critical path, rig strategy)
- Well construction sequences (surface and subsea wellheads, casing and cementing program strategies, drilling fluids selection, wellbore stability, NPT avoidance)
- Transition to completion/intervention (barrier maintenance, job sequencing, intervention options)

---

**Virtual Schedule and Tuition (USD)**

2018-19 Schedule and Tuition (USD)

Houston, US 25 Mar - 18 Apr 2019 $3885

26 Aug - 26 Sep 2019 $3885

See website for dates and locations.

---

*plus computer charge*
Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Directional, Horizontal, and Multilateral Drilling – DHD

INTERMEDIATE 5-Day

This course builds a firm foundation in the principles and practices of directional drilling, calculations, and planning for directional and horizontal wells. Specific problems associated with directional/horizontal drilling such as torque, drag, hole cleaning, logging, and drill string component design are included.

Participants will receive instruction on planning and evaluating horizontal wells based on the objectives of the operator and horizontal well. The basic applications and techniques for multi-lateral wells are covered in the course. Additionally, they will become familiar with the tools and techniques used in directional drilling such as survey instruments, bottomhole assemblies, motors, steerable motors, and steerable rotary systems. Participants will be able to predict wellbore path based on historical data and determine the requirements to hit the target.

DESIGNED FOR

Drilling, production and operations engineers, field supervisors, toolpushers, managers, and technical support personnel.

YOU WILL LEARN HOW TO

• Make survey calculations
• Interpret TVD, polar and rectangular coordinates, and vertical section
• Interpret dogleg severity and the problems associated with dogleg severity
• Plan a two-dimensional directional well
• Plan horizontal wells based on the objectives of the well
• Determine the best multi-lateral completion for an application
• Determine declination and non-magnetic drilling collar selection
• Apply the best survey instrument for the job
• Directionally drill with rotary BHAs, jetting, whipstocks, motor, steerable motors, and rotary steerable systems
• Drill horizontally underbalanced
• Interpret torque and drag and determine what factors will affect the torque and drag
• Determine cementing requirements for directional wells

COURSE CONTENT

Applications for directional drilling • Directional profiles • Extended reach wells • Survey calculations and accuracy • Dogleg severity calculations and problems associated with doglegs • Planning directional and horizontal wells • Horizontal drilling methods and applications • Logging high angle wells • Hole cleaning • Multi-lateral • Types of survey instruments • Tools used to deflect a wellbore • Torque and drag calculations • Cementing

Drill String Design and Optimization – DSD

INTERMEDIATE 5-Day

We have been presenting Drill String Design workshops for over 12 years for all types of operations around the world. We are constantly updating our materials to reflect the latest technology applications for both near-vertical and high-angle well designs while maintaining a thorough grounding in the fundamentals. Workshop content is often customized to address customer-specific operational situations and software applications. Course tuition includes a copy of DG-1 Drill String Design Standard 4th Ed. Vol. 2.

DESIGNED FOR

Operator, drilling contractor, and service company engineers; drilling supervisors and superintendents. This is an intensive technical workshop. A calculator is required and a laptop is strongly recommended. Class size is typically limited to 18-20.

YOU WILL LEARN HOW TO

• Place the drill string design process in context with other planning and operational considerations
• Refresh underlying physics of drill string failures and mechanical properties of drill string materials
• Clarify performance properties of drill string components and how to apply design margins
• Design cost-effective BHAs and match them to your bit
• Gain specific application experience analyzing common load cases for both near-vertical and high-angle situations: tension loads, torque loads, combined tension-torque loads, fatigue loads, buckling loads
• Understand the basis for industry software design tools, including torque and drag, casing wear, and hydraulics
• Identify drilling tools and operational practices to reduce both torque and drag and casing wear
• Diagnose and mitigate vibration to reduce drill string damage and failure
• Optimize your drill string inspection program using the latest industry standards

COURSE CONTENT

Drill string and BHA failure prevention • Low-angle design applications • High-angle design applications • Torque, drag, and casing wear mitigation • Vibration monitoring and avoidance • Drill string handling and inspection

Managing Wellsite Operations – MWC

INTERMEDIATE 5-Day

Managing Wellsite Operations is an interactive course that teaches participants to successfully manage wellsite operational plans, resource time management, and control measures. Interpersonal skills associated with the art of managing the Jofari window through active listening and conducting crucial conversations is exercised throughout the course. This course brings together documented case histories of complex well operations and techniques to manage associated human factors. Participants will learn to build effective teams by assuming roles in class exercises of the company representative, rig contractor, and supplier personnel. Critical issues are identified to improve safety and reduce trouble time. Improving the facilitation of wellsite activity planning, rig instructions, and work processes is exercised to improve operator, contractor, and service provider performance metrics.

DESIGNED FOR

Operator, drilling contractor, and service company engineers; drilling supervisors and superintendents. This is an intensive technical workshop. A calculator is required and a laptop is strongly recommended. Class size is typically limited to 18-20.

YOU WILL LEARN HOW TO

• Manage key relationships between surface – subsurface part of the well program
• Manage technical and interpersonal skills associated with complex operations
• Manage self and rig team situational awareness and competencies
• Manage communications to improve wellsite performance and build effective rig teams
• Manage the well monitoring program to reduce lost time risks

COURSE CONTENT

Rig team priorities and success measures • Focusing on onsite challenges, distractions, and sensitivities • Managing reports and rig documentation • Rig meetings and drills • Well monitoring, limits, alarms, and suspension of operations • Reducing unscheduled events, technical limits, and drilling/completing well on paper techniques • Managing complex situations associated with tripping, displacements, and testing

Practical Drilling Skills – PDS

INTERMEDIATE 5-Day

This course teaches how to listen to the well, perform simple tests on the rig, and make proper decisions unique to each well. The intent is to eliminate visible and invisible Non-Productive Time (NPT). Visible NPT includes stuck pipe, conditioning drilling fluid, lost circulation, etc. Invisible NPT is often far more expensive and includes drilling much slower than is possible, wearing out the bits prematurely, and bad cement barriers. Considerable attention is devoted to correcting drilling fluid properties and controlling filter cake quality. This eliminates many seen and unseen obstacles for drilling a trouble-free hole as cheaply as possible. This involves proper drilling fluid processing in the surface tanks. No discussion will be presented of fishing tools, they should rarely be needed after this course. Bring a calculator, you will need it.

DESIGNED FOR

Experienced people on drilling rigs who want to drill cheaper, specifically drilling rig personnel, drilling engineers, drilling rig supervisors, tool pushers, drilling managers, and service company personnel. This course is NOT recommended for inexperienced personnel or people not directly involved with actual drilling operations. You should have completed the Basic Drilling Technology course or have several years of drilling experience to gain the most from the course.

YOU WILL LEARN HOW TO

• Calibrate a mud logger’s gas unit curve • Interpret gas unit curves • Determine pore pressure • Select the correct nozzle sizes and flow rate to make the fluid strike the bottom of the hole with the greatest force possible or the greatest power available • Select drilling fluid yield point needed to clean the vertical portion of the well • Extend the life of drill bits and have the maximum drilling rate by optimizing the flounder point of a roller cone or PDC bit • Avoid poor cementing jobs by creating a thin, slick, compressible filter cake • Decrease vibration which seriously impacts PDC bit performance by eliminating drilled solids • Arrange equipment for a proper PIT • Read Pressure Integrity charts • Evaluate drill bits to select the best next bit • Understand well bore instability

COURSE CONTENT

Interpretation of mud logger gas units • Determining pore pressure • On-site hydraulic optimization • Selecting proper bit loading (weight on bit and rotary speed) for the fastest, cheapest hole • Interpreting pressure integrity tests • Hole problems (such as, stuck pipe, lost circulation, and ballooning) • Borehole stability • Operating guidelines • Drilling fluid properties necessary to maximize drilling performance • Discussion of polymers in drilling fluids • Solids control equipment arrangement to assure best drilled solids removal

2018-19 Schedule and Tuition (USD)

DENVER, US 15-19 JULY 2019 $4420
HOUSTON, US 3-7 DEC 2018 $4340
20 APRIL-3 MAY 2019 $4425
9-13 DEC 2018 $4252
OKLAHOMA CITY, US 10-14 SEPTEMBER 2019 $4250
DENVER, US 6-12 JULY 2019 $4565
KUALA LUMPUR, MY $5460
14-18 OCT 2019
HOUSTON, US 10-14 SEPTEMBER 2019 $4240
9-13 SEPTEMBER 2019 $4425

See website for dates and locations.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)

Any course is available inhouse at your location. Contact us today.
**Explore the Unconventional.**

### Unconventional Course Progression Matrix

<table>
<thead>
<tr>
<th>BASIC</th>
<th>FOUNDATION</th>
<th>INTERMEDIATE</th>
<th>SPECIALIZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>FOUNDATIONS OF PETROPHYSICS - FPS</td>
<td>PETROPHYSICS OF UNCONVENTIONAL RESERVOIRS - PUR</td>
<td>USE OF FULL AZIMUTH SEISMIC AND MICROSEISMIC FOR UNCONVENTIONAL PLAYS - FAMS</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>RESERVOIR MANAGEMENT FOR UNCONVENTIONAL RESERVOIRS - RMUR</td>
<td>APPLIED ROCK MECHANICS - ARM</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>DIRECTIONAL, HORIZONTAL, AND MULTILATERAL DRILLING - DHD</td>
<td>UNCONVENTIONAL RESOURCE AND RESERVE EVALUATION - URR</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>COALBED METHANE RESERVOIRS/ADVANCED ANALYSIS TECHNIQUES - CMR</td>
<td>COALBED METHANE RESERVOIRS/ADVANCED ANALYSIS TECHNIQUES - CMR</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>HORIZONTAL AND MULTILATERAL WELLS: ANALYSIS AND DESIGN - HML1</td>
<td>HORIZONTAL AND MULTILATERAL WELLS: ANALYSIS AND DESIGN - HML1</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>ARTIFICIAL LIFT FOR UNCONVENTIONAL WELLS ALD</td>
<td>ARTIFICIAL LIFT FOR UNCONVENTIONAL WELLS ALD</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>UNCONVENTIONAL RESOURCES COMPLETION AND STIMULATION - URC</td>
<td>UNCONVENTIONAL RESOURCES COMPLETION AND STIMULATION - URC</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>PRODUCTION OPERATIONS 1 - PO1</td>
<td>PRODUCTION OPERATIONS 1 - PO1</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>OPERATIONS AND DEVELOPMENT OF SURFACE PRODUCTION SYSTEMS - PO4</td>
<td>OPERATIONS AND DEVELOPMENT OF SURFACE PRODUCTION SYSTEMS - PO4</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>COMPLETIONS AND WORKOVERS - CAW</td>
<td>COMPLETIONS AND WORKOVERS - CAW</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>Evaluating and Developing Shale Resources - SPE</td>
<td>Evaluating and Developing Shale Resources - SPE</td>
</tr>
<tr>
<td>PETROLEUM SYSTEMS ANALYSIS - PSA</td>
<td>WELL TEST DESIGN AND ANALYSIS - WDA</td>
<td>Basic Petroleum Technology - BPT</td>
<td>Basic Petroleum Technology - BPT</td>
</tr>
</tbody>
</table>

### Course Content
- Drilling fluids containing too many drilled solids increase trouble costs or visible and invisible Non-Productive Time (NPT). Invisible NPT relates to drilling performance, excessive volumes of drilling fluid, as well as cementing problems and barrier failure. All drilling fluid surface treatment systems should have three identifiable sections: Suction, Addition, and Removal. The suction section must blend the fluid so that the mud weight in the drill pipe is the same from top to bottom for reliable well control. Tank volumes, agitation, mud guns, and additional procedures are discussed to ensure a homogeneous fluid.

Drilled solids are easier to remove when they are large. Solids control starts with cuttings removal at the drill bit to eliminate regrinding and reduced drilling rate. Removal of drilled solids requires an understanding of the performance of shale shakers, hydrocyclones, mud cleaners, and centrifuges. Analysis procedures applicable for all drilling rigs, large and small, as well as any drilling fluid, will be discussed. Procedures will be presented to determine the optimum drilled solids removal efficiency for each target drilled solids concentration.

### Designed for
- Only people interested in eliminating nonproductive time while drilling, such as: drilling engineers, drilling rig supervisors, tool pushers, drilling managers, operating company personnel and reservoir engineers.

### You Will Learn How To
- Evaluate the effect of drilled solids on the total cost of a well
- Remove drilled solids expeditiously from beneath the drill bit
- Transport drilled solids to the surface
- Arrange each component of a drilling fluid processing plant for proper performance
- Determine the Equipment Solids Removal Efficiency of the system
- Understand the new API RP 13C (Solids Control)
- Evaluate the effect of drilled solids on drilling fluid properties
- Minimize drilling fluid discarded

### Course Content
- Analysis of different aspects of drilling affected by drilled solids: solids transport capabilities of a drilling fluid; how shale shakers separate drilled solids; the new API shaker screen designation and how it works; types of motion of shale shakers; how hydrocyclones and centrifuges separate drilled solids; how equipment should be arranged on a drilling fluid processing plant; selecting the proper centrifugal pump impeller; mud tank agitation; mud gun placement; degasser operation and objective; guidelines for effective drilled solids removal; trip tank operation; calculating solids removal efficiency; evaluating mud cake compressibility; developing a thin, slick compressible filter cake in a well bore, maintaining a homogeneous fluid to fill drill pipe.

Breakthroughs in technology have placed unconventional resources at the center of the US E&P and Midstream sector growth. Interest continues to expand internationally. PetroSkills Unconventional Resource offerings enable participants to develop and hone critical competencies associated with the development and management of shale oil/gas, tight gas, and coalbed methane resource plays. Challenges with developing unconventional resources require enhanced project management expertise, more cost-effective testing and completion protocol, enhanced production operations techniques, and greater efficiencies in the process and treating of produced fluids and gases.

Count on PetroSkills to help build your organizational capability in the Unconventionals.

**FOR MORE INFORMATION ON THESE PROGRAMS, VISIT US AT www.petroskills.com/unconventional**
The Course Progression Matrix below shows how the Petrophysics courses in this section are structured within each topic, from Basic to Specialized. On either side of the Petrophysics section, you will see courses in associated disciplines for cross-training. These matrices are ideal for building training plans for early-career staff or finding the right course to build upon existing knowledge and experience.

Foundations of Petrophysics - FPP on page 24 and Well Log Interpretation - WLI on page 25 are essential as foundation Petrophysics courses. We are also happy to offer two newer courses, Mudlogging – MDLG on page 25 and Nuclear Magnetic Resonance Petrophysics – NMRP on page 26.

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

| Dr. Ahmed Badruzaman | Dr. Andrew Chen | Dr. Arau Elewa | Mr. Eric Foster | Ms. Laura Folk | Mr. Paul Gardner | Mr. Bob Lippincott | Mr. David Patrick Murphy | Dr. Carl Sondergeld | Dr. John Spivey | Dr. E.C. Thomas | Dr. Jack Thomas |

### PETROPHYSICS

<table>
<thead>
<tr>
<th>Geology and Geophysics</th>
<th>Petrophysics</th>
<th>Reservoir Engineering</th>
<th>Production and Drilling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Petroleum Geology (Pkg. 1)</td>
<td>Basic Petroleum Technology (Pkg. 2)</td>
<td>Basic Petroleum Technology Principles (Pkg. 3)</td>
<td>Basic Petroleum Engineering (Pkg. 4)</td>
</tr>
<tr>
<td>Well Log Interpretation (Pkg. 25)</td>
<td>Core and Core Analysis (Pkg. 25)</td>
<td>Foundations of Petrophysics (Pkg. 24)</td>
<td>Basic Field Geology (Pkg. 2)</td>
</tr>
<tr>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Clay Diagenesis (Pkg. 26)</td>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Basic Petroleum Geology (Pkg. 1)</td>
</tr>
<tr>
<td>Spontaneous Potential (Pkg. 26)</td>
<td>Production Logging (Pkg. 34)</td>
<td>Spontaneous Potential (Pkg. 26)</td>
<td>Basic Petroleum Technology (Pkg. 3)</td>
</tr>
<tr>
<td>Capillary Pressure (Pkg. 26)</td>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Basic Petroleum Technology Principles (Pkg. 5)</td>
</tr>
<tr>
<td>Basic Petroleum Geology (Pkg. 1)</td>
<td>Cased Hole Formation and Evaluation (Pkg. 27)</td>
<td>Open Hole Geology (Pkg. 13)</td>
<td>Basic Petroleum Geology (Pkg. 1)</td>
</tr>
<tr>
<td>Thermal and Low Energy Electromagnetic Logs (Pkg. 27)</td>
<td>Basic Petroleum Geology (Pkg. 1)</td>
<td>Structural and Stratiographic Interpretation of Cements (Pkg. 27)</td>
<td>Basic Petroleum Technology Principles (Pkg. 5)</td>
</tr>
<tr>
<td>Open Hole Geology (Pkg. 13)</td>
<td>Basic Petroleum Geology (Pkg. 1)</td>
<td>Production Logging (Pkg. 34)</td>
<td>Basic Petroleum Technology Principles (Pkg. 5)</td>
</tr>
<tr>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Basic Petroleum Geology (Pkg. 1)</td>
<td>Nuclear Magnetic Resonance (NMR) Petrophysics (Pkg. 26)</td>
<td>Basic Petroleum Technology Principles (Pkg. 5)</td>
</tr>
</tbody>
</table>

### COURSE CONTENT

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

### FOUNDATION

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

### DESIGN 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

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

### VIRTUAL DELIVERY $4325

PETROSKILLS.COM/FPP-BLENDED

<table>
<thead>
<tr>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

FPP is also available as a self-paced, virtual course which is an enhanced version of the face-to-face public session.
## Well Log Interpretation – WLI

### FOUNDATION 5-Day

The most universal, comprehensive, and concise descriptive documents on oil and gas wells are logs. They impact the work of almost every oilfield group from geologists to roustabouts to bankers. Familiarity with the purposes and optimum applications of well logs is essential for people forging their careers in the oil business. The instructor uses a novel approach to help participants develop a good grounding in understanding and applying well logging techniques. General principles of physics are presented to explain the functioning of modern logging tools. Whenever possible, the physics of logging measurements is related to everyday tools and applications. Participants develop an appreciation for the constraints and limitations of operating in the borehole environment. A number of actual log examples are related to basic principles in the description of reservoir properties such as porosity, mineralogy, formation factor, saturation, and hydrocarbon type for essentially clean reservoirs. Cross-plottting 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 mineralogical, porosity, and saturation in various lithogies
- 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, lateralogy
- Reservoir/non-reservoir discrimination
- Multi-sensitivity logs, GR, SGR, Pe
- 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 crosplots and mineralogy identification
- Partially saturated rock properties and Archie Equation
- Linear movable oil plot
- Reconstruction techniques, Rea, FF, PP
- Logarithmic scalar
- Porosity-resistivity crosplots
- Permeability relationships
- Nuclear magnetic resonance
- Use of pressure measurements
- Computerized log evaluation
- Sidewall core
- Coring and core analysis

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>25-29 MAR 2019</td>
<td>$5060+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>29-APR-3 MAY 2019</td>
<td>$4300+GST</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>7-11 APR 2019</td>
<td>$5475+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>KUALA LUMPUR, MY</td>
<td>29 JUL-2 AUG 2019</td>
<td>$2520</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 NOV 2018</td>
<td>$4965+VAT</td>
</tr>
<tr>
<td>PERTH, AUS</td>
<td>28 OCT-1 NOV 2019</td>
<td>$5240+GST</td>
</tr>
</tbody>
</table>

## Coring and Core Analysis – CCA

### FOUNDATION 5-Day

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

**LAB VISIT**

- 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, core 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 mnr log calibration, acoustic, nuclear, and electrical properties)
- Introduction to rock mechanics
- Wettability, relative permeability, capillary pressure, and reservoir fluid distribution

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONDON, UK</td>
<td>8-10 MAR 2019</td>
<td>$4500</td>
</tr>
<tr>
<td>PERTH, AUS</td>
<td>29 JUL-2 AUG 2019</td>
<td>$2520+VAT</td>
</tr>
</tbody>
</table>

## Mudlogging – MDLG

### FOUNDATION 5-Day

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

### DESIGNED FOR

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

### YOU WILL LEARN HOW TO

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

### COURSE CONTENT

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

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>6-10 MAY 2019</td>
<td>$4500</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, wireline logging and log analysis, coring and core analysis, petrophysics, geophysics, geochemistry, formation testing, rock mechanics, hydraulic fracturing, and petroleum economics.

### DESIGNED FOR

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

### YOU WILL LEARN HOW TO

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

### COURSE CONTENT

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

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>8-12 OCT 2018</td>
<td>$4240</td>
</tr>
</tbody>
</table>
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
• Close correct a set of mercury/air capillary pressure data
• Fit and analyze capillary pressure data using Thomeer, Leverett-J, and Broek-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 petrographic 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 pressure data • Capillary pressure data representing capillarity 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 petrography • Saturation-height functions • Surface phenomena, capillarity, wettability, and interphase tension • The competition between capillary and gravity forces • Relationships between initial and residual saturations • Interpretation of single and multiple pore system rocks • Clay-bound water • Capillary pressure vs. NMR • Seal capacity

Integration of Rocks, Log and Test Data – ILC

INTERMEDIATE 5-Day

This course provides the background necessary to address the more complex reservoir evaluation and productivity challenges within exploration, field appraisal, and field development. The key fundamentals of rock properties, logging tools, and engineering data required to solve these problems are reviewed. The concepts are illustrated with a series of real world examples that become increasingly complex as capillary pressure 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 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 on reservoir quality • 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 • Conventional and computerized components • Geofluid sensitivity • Review of production profiles • Overview of pressure transient analysis • Calculation of Vclay/Visable 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

Nuclear Magnetic Resonance (NMR) Petrophysics – NMMP

INTERMEDIATE 4-Day

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

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

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

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

Shaly Sand Petrophysics – APS

INTERMEDIATE 5-Day

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

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

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

COURSE CONTENT
Review of log interpretation techniques in clean formations • Core analyses and applications of specific core tests • Petrophysical analysis (thin section, X-ray diffraction SEM/EDS) for shaly sand evaluation • The nature of clay minerals and shale laminations and how they are distributed in shaly sands • Influence of clay minerals and shale laminations on petrophysical properties • Occurrence of clay minerals and shale laminations in reservoir rocks and relation to depositional environment and diagenesis • Integration of petrophysical, core, and log data for evaluation of shaly sands • Effects of clay minerals and shale laminations on log responses in shaly sands; various methods of shale content evaluation • Models for porosity and saturation determination: total and effective porosity; and Archie, Waxman-Smits, Dual Water and Jafurah saturation methods • Prediction of permeability and producibility from logs in shaly sands: identification of bypassed pay • Use of advanced logs (NMR, BHI, Dipmeters) integration with core data for purposes of evaluation
Any course is available inhouse at your location. Contact us today. +1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)

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

**INTERMEDIATE 5-Day FIELD TRIP**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

---

**Applied Rock Mechanics – ARM**

**SPECIALIZED 3-Day**

Understanding the stress, strain, and failure 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 competing poorly cemented formations. Borehole instability, caving shale, subsidence, stuck pipe, and sand control issues cost the petroleum industry many billions of dollars annually. Now 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 stress, strain, and failure mechanics of rock formations
- 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 • Wellbore and field measurement of in-situ (earth) stresses • Overview of common rock mechanics tests (lab demonstrations) • Stress orientation techniques • Elastic, plastic, and viscous models of rock behavior • Borehole stability • Sand control • Fracture mechanics • Unconventional reservoir applications • Reservoir engineering applications • Wireline log predicted mechanical properties • Data integration

---

**Cased Hole Formation Evaluation – CH**

**SPECIALIZED 4-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

---

**Wireline Formation Testing and Interpretation – WFT**

**SPECIALIZED 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

---

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denver, CO</td>
<td>1-5 Oct 2018</td>
<td>$4615</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>1-11 Oct 2019</td>
<td>$4735</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>13-17 May 2019</td>
<td>$4565</td>
</tr>
</tbody>
</table>

† includes field trip

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston, TX</td>
<td>3-5 Dec 2018</td>
<td>$3285</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>18-20 Nov 2019</td>
<td>$3365</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>Houston, TX</td>
<td>14-17 Oct 2019</td>
<td>$4055</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>Dubai, UAE</td>
<td>16-20 June 2019</td>
<td>$5645 +VAT</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>22-26 April 2019</td>
<td>$4525</td>
</tr>
</tbody>
</table>

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Reservoir Engineering
Course Progression Matrix

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, Basic Reservoir Engineering – RE on page 29, 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:

Mr. Jeff Aldrich
Dr. Rasaun Aracher
Dr. Ashu Basha
Dr. Rodrigo Camacho-Velasquez
Dr. Abhil Das-Gupta
Dr. Mohen Deliand
Dr. Iskander Dvashob
Mr. Greg Erster
Mr. Curtis Geiske
Mr. Mason Gomez
Dr. Ton Grinberg
Dr. Greg Hazlett
Mr. Richard Henry
Mr. Timothy Hower
Dr. Chun Huh
Dr. Russell Johns
Dr. Mohan Kolga
Mr. Stanley Klebaner
Dr. Larry W. Lane
Dr. Kishore Manlanty
Mr. David Patrick Murphy
Dr. Grant Robertson
Mr. Deborah Ryan
Dr. Hilary Saydovan
Mr. Richard Schoderer
Mr. John Seile
Mr. Rod Seile
Dr. Jeffrey Slater
Dr. John Spivey
Dr. Dave Wageman

Applied Reservoir Engineering – RE on page 29, represents the core of our reservoir engineering program and the foundation for all future studies in this subject.
Basic Reservoir Engineering – BR

5-Day

This course is designed to help the participants develop a more complete understanding of the characteristics of oil and gas reservoirs, from 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.

Applied Reservoir Engineering – RE

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 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. RE is offered in one-week Basic Reservoir Engineering and Reservoir Engineering for Other Disciplines courses.

YOU WILL LEARN

• Determine critical properties of reservoir rocks (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

FOUNDATION

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 in-place with volumetric methods, build hydrocarbon volume vs depth relationships, and review reserve booking guidelines • Oil recovery material balance, Hovem-Odeh method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs • Oil field testing: radial flow theory, wellbore storage and skin, drawdowns, buildup 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 oil & aquifer analysis and description • Immiscible displacement: fluid displacement process, fractional flow, Buckley Leverett, Wele • Description of coning, cusping, and over/under running, critical rates calculations, breakthrough times, horizontal well applications • Gas reservoirs: volumetric, water drive and compartmentalized 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: why simulate? Various simulation models, simulator types, setting up a simulator model

10-6.0 Reservoir Management - Online Learning
11 2.0 Reservoir Fluid Displacement - Sessions 1 and 2
12 4.0 Enhanced Oil Recovery - Online Learning
13 2.0 Improved Oil Recovery - Session 1
14 4.0 Reservoir Simulation
15 4.0 Reservoir Surveillance - Online Learning
16 6.0 Reservoir Management Fundamentals - Session 1

TO LEARN MORE, VISIT PETROSKILLS.COM/RE-BLENDED
**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 engineer’s 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, reserve booking practices, and reservoir recovery efficiencies
- Material Balance Methods: oil reservoir material balance, Havlena Devin method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs
- Fluid flow and well performance: radial and linear flow, transient, pseudo-steady state, steady state flow regimes, productivity of vertical and horizontal wells
- Aquifer influx and immiscible Displacement. Fluid displacement process, fractional flow, Buckley-Leverett, Weber, water under running, and gas overriding
- Coning and Cusing: description of process, critical rates, using horizontal wells
- Reservoir Types and Drive Mechanisms: gas reservoirs - volumetric, water drive and compaction drive; oil reservoirs - solution gas drive, water drive, water flood, gas cap expansion, combination drive, naturally fractured and critical reservoir fluid recovery
- 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>Start Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>26-30 Nov 2018</td>
<td>$4890+VAT</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>2-6 Jul 2019</td>
<td>$5025+VAT</td>
</tr>
<tr>
<td>KUALA LUMPUR, MY</td>
<td>12-16 Nov 2019</td>
<td>$5070</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>17-21 Sep 2019</td>
<td>$4980+VAT</td>
</tr>
<tr>
<td>THE HAGUE, NLD</td>
<td>23-27 Sep 2019</td>
<td>$5035</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 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
- Hydraulically fractured wells
- Horizontal wells
- Naturally fractured reservoirs

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Start Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>8-12 Oct 2018</td>
<td>$4265</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>7-11 Oct 2018</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>9-13 Dec 2018</td>
<td>$5035+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 possibilities that present 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 EOR behavior changes 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
- Selection of appropriate methods for improving oil recovery
- Enhance oil recovery beyond waterflooding or immiscible gas injection project
- Enhance oil recovery through secondary recovery phases
- Implement EOR methods
- Technology transfer and set realistic expectations on EOR behavior changes and recovery improvement
- Implement EOR methods
- Technology transfer and set realistic expectations on EOR behavior changes and recovery improvement
- Use designing procedures - theoretical, laboratory tests, and field pilots
- 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

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Start Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONDON, UK</td>
<td>26-30 Nov 2018</td>
<td>$4265</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 Aug 2019</td>
<td>$5035+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 numerical 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 perform 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 field flood 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, PPR, 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>Start Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAKERSFIELD, US</td>
<td>9-13 Dec 2018</td>
<td>$4270</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29-31 Jul 2019</td>
<td>$4400</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29-31 Jul 2019</td>
<td>$4525</td>
</tr>
</tbody>
</table>
**Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies – RFP**

**FOUNDATION 5-Day**

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 other 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 surface 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 IQ-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, gasses, 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 5-Day**

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 cost 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 waterflood physics as well as to optimize the development of a hypothetical field.

**DESIGNED FOR**
Reservoir, production, facilities, and operations engineers who are involved in 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 displacing oil • Statistical forecasting • Analytical forecasting • Numerical forecasting • Injector monitoring • Producer monitoring • Integrated monitoring • Effect of water imbibition • Surface processing of injection and produced water • Water shut-off • Pattern rotation • Natural and hydraulic fractures • Horizontal well applications • Downhole separation • Enhanced waterfloods • Waterflooding planning • Many case histories

**RESERVOIR ENGINEERING 31**

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

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAKERSFIELD, US</td>
<td>29 OCT-2 Nov 2018</td>
<td>$4240</td>
</tr>
<tr>
<td></td>
<td>28 OCT-1 Nov 2019</td>
<td>$4270</td>
</tr>
<tr>
<td></td>
<td>10-14 SEP 2019</td>
<td>$4190+GST</td>
</tr>
<tr>
<td></td>
<td>9-13 SEP 2019</td>
<td>$4270+GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>3-7 JUNE 2019</td>
<td>$4325</td>
</tr>
<tr>
<td></td>
<td>15-19 AUG 2019</td>
<td>$5055+VAT</td>
</tr>
</tbody>
</table>

* plus computer charge

---

**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
- Close correct a set of mercury/air capillary pressure data
- Fit and analyze capillary pressure data using Thomeer, 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 residual and irreducible 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 the 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 conventionally 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, upsampling 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. It 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 analogies, volumetric analysis, performance analysis, and material balance • Supplemental compliant estimation techniques incorporating probabilistic analysis and simulation • Economics and reserves • Special reserves estimation topics - 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 specification for your own company around such a case study. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time.

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

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

COURSE CONTENT
Business value drivers and selection criteria • The scale and resolution of data • 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

2018-2019 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</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>$115+VAT</td>
</tr>
</tbody>
</table>

* plus computer charge

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<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>

* plus computer charge

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
</table>

* plus computer charge

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUBAI, UAE</td>
<td>17-21 Mar 2019</td>
<td>$5545+VAT</td>
</tr>
</tbody>
</table>

* plus computer charge

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>17-21 Sep 2018</td>
<td>$4340</td>
</tr>
</tbody>
</table>

* plus computer charge

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>26-30 Nov 2018</td>
<td>$5770</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>22-26 Jul 2019</td>
<td>$5135+VAT</td>
</tr>
</tbody>
</table>

* plus computer charge

Any course is available inhouse at your location. Contact us today.
**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 • Minimizing drilling of unnecessary wells • Wellbore 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 plan • 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 shale). 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 light 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 (DFTIs & 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.)
- Collect 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-Leverett displacement • 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

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
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-curves 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 curve analysis. 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, Stag’s, P/2 vs. Qp, 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 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 mistakles • Production decline type-curves: introduction and historical background, how to use modern Fetkovich type-curves for forecasting production • Brief discussion of unconventional oil/gas reservoir decline analysis and production forecast

2018-19 Schedule and Tuition (USD)
BAKERSFIELD, US 5-6 NOV 2018 $2575
OKLAHOMA CITY, US 22-23 JULY 2019 $2640

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 reservoir 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 hydraulically fractured 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 wellsbores 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, coiledtubestimulators

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 methods. Options to predict well performance and recovery from horizontal and multilateral wells are presented with integration of inflow and wellbores 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, multi lateral, and intelligent wells from geological and reservoir aspects
• Assess multidisciplinary inputs for successful decline curve forecasting
• 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 characterizations • 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 damage and completion 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

2018-19 Schedule and Tuition (USD)
KUALA LUMPUR, MALAYSIA 15-17 JULY 2019 $5420
LONDON, UK 3-7 SEPT 2019 $5500+VAT
BANGKOK, THAILAND 24-26 SEPT 2019 $5250+VAT
SINGAPORE 25-29 MAR 2019 $5480+GST

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/fluid-flow behavior to reservoir management strategies in naturally-fractured reservoirs
• Evaluate the impact of natural fractures on hydraulic fracture stimulation

COURSE CONTENT
Characterization of natural fractures and fracture systems • Influence of mechanical stratigraphy and structure on fracture development • Detection and prediction of subsurface natural-fracture occurrence and intensity from cores and well logs • Fractured rock properties affecting reservoir performance • Classification of naturally-fractured reservoirs with reservoir examples and potential production problems • Naturally-fractured reservoirs: fluid-flow, well performance and well testing, reservoir performance, numerical simulation • Geomechanics/fluid-flow • Behavior and stimulation of naturally-fractured reservoirs • Effects of natural fractures on reservoir permeability, anisotropy, drainage area, and waterflow sweep efficiency
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 upside 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 reservoirs 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
• Review and compare alternative field 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 • Exploration Opportunities: reservoir enhancement through fluid injection, redevelopment of mature waterfields, infill drilling, its utility, application, and value; horizontal and multilateral wells including their use in displacement projects, re-completions in stranded reservoirs, de-bottlenecking gathering systems, produced water management, co-production of water for improved recovery

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 exposes 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 methods
• Simulate flow and visualize results at the geologic model scale
• Calculate swept areas and drainage volumes
• Optimize streamline model
• Perform reservoir surveillance and flood optimization using streamlines
• Integrate streamlines with finite-difference simulators
• Validate upcased and upgraded geologic models
• Perform streamline assisted history matching of reservoir models
• Apply streamline simulation for complex reservoir geometries and flow processes

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 resource 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 as well being included, depending on participant interest.

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

YOU WILL LEARN HOW TO
• Differentiate reserve estimation approaches within shale oil/gas, tight gas, CBM/CSS, 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 reservoirs • 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 • Hybrid data collection programs • Reserve evaluations • Reserve portfolio management • Alternate evaluation approaches • Ethics and public information releases

See website for dates and locations.

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAKERSFIELD, US</td>
<td>1-5 APR 2019</td>
<td>$4470</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>17-21 NOV 2019</td>
<td>$5645+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>22-25 OCT 2018</td>
<td>$4440</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>21-25 OCT 2018</td>
<td>$4252</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>12-16 JUN 2019</td>
<td>$5235+VAT</td>
</tr>
</tbody>
</table>

*plus computer charge

Any course is available inhouse at your location. Contact us today.

Need Effective e-Learning? We Can Help!

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

Please visit petroskills.com/elearning or email us at solutions@petroskills.com

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
The Course Progression Matrix below shows how the Production and Completions courses in this section are structured within each topic, from Basic to Specialized. On either side of the Production and Completions 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.

Production Operations 1 – P01 leads off this section on page 37 and represents the core foundation of the production engineering course curriculum and is the foundation for future studies in the discipline. The next course, Completions and Workovers – CAW, is an introduction to many facets of completion and intervention technology, and is one of our most popular courses. For all of your Hydraulic Fracturing needs—both applied and advanced—see page 40.

The following instructors have been approved by the PetroSkills Curriculum Network:
Production Operations 1 – PO1

FOUNDATION 10-Day

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, low-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 perforation and workover 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 organic 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 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 completions: rod pump, gas lift, ESP, PFP, plunger lift, and others • Problem well analysis • and more...

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>City</th>
<th>Location</th>
<th>Dates</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>20-21 MAY 2019</td>
<td>$7750+GST</td>
<td></td>
</tr>
<tr>
<td>DENVER, CO</td>
<td>20-21 MAY 2019</td>
<td>$7750</td>
<td></td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>20-21 MAY 2019</td>
<td>$7750+VAT</td>
<td></td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>20-21 MAY 2019</td>
<td>$7750</td>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>20-21 MAY 2019</td>
<td>$7750</td>
<td></td>
</tr>
</tbody>
</table>

PO1 is also available as a virtual course which is an enhanced version of the face-to-face public session.

11 MAR - 21 JUN 2019  | $7850
27 MAY - 20 SEP 2019  | $7850
16 SEP 2019 - 17 JAN 2020  | $7850

*plus computer charge
Well Stimulation: Practical and Applied

**BASIC 5-Day**

Too often in today’s dynamic oil and gas industry, not enough attention is paid to the details of well stimulation treatments. This can result in poor and/or less than optimum results. Those involved in the planning, execution, and evaluation of stimulation treatments need to have the background and training in the basics so better decisions can be made resulting in more gas down the line or oil in the tank! This practical course is designed for those involved in all aspects of well stimulation. To be better able to make decisions it is important to have a basic understanding of the types of formations and basic reservoir properties with which we deal. For this reason, time is spent in the early portion of the course setting the geological and reservoir purpose stage for vertical, horizontal, and multilateral wells prior to developing the basic formation damage, acidizing, and hydraulic fracturing concepts. The course includes acidizing and fracturing quality control, conducting the treatment, monitoring pressures, and other critical parameters during and after the treatment. An important part of the course is class teamwork whereby the attendees divide into teams to evaluate and select optimum stimulation treatments. These exercises bring out many important parameters discussed during the course. This subject is briefly covered in the PetroSkills Production Operations 1 course (Foundation Level)* as well as in the Formation Damage: Causes, Prevention, and Remediation (Intermediate Level) course. However, this course focuses in more detail on the basics of stimulation than either of the two previously mentioned courses.

**DESIGNED FOR**

Those involved in the planning, execution and evaluation of well stimulation treatments in conventional as well as unconventional plays, including the shales. This includes completion, production, reservoir, and drilling engineers; field supervisors; production foremen; engineering technicians; and geologists.

**YOU WILL LEARN**

- How to select stimulation techniques best suited for various formation types and situations
- To apply basic non-acid and acidizing concepts
- To apply basic hydraulic fracturing concepts

**COVERAGE CONTENT**

Geological/basic reservoir properties • Formation damage - how and why it happens • Non-acid damage removal techniques • Acidizing - objectives, types, additives • Acidizing placement techniques and the pressure chart • Quality control and safety • Hydraulic fracturing materials and their importance to success, including gel and slick water treatments • The frac chart • Hydraulic fracturing quality control and safety • Energized fluids - application and safety

### Surface Production Operations – PO3

**BASIC 5-Day**

This course presents a basic overview of all typical oilfield treating and processing equipment. Participants should learn not only the purpose of each piece of equipment but how each works. Emphasis is on gaining a basic understanding of the purpose and internal workings of all types of surface facilities and treating equipment. A major goal of this course is to improve communication among all disciplines, the field, and the office. Better communication should enhance operational efficiencies, lower costs and improve production economics. Example step-by-step exercises are worked together with the instructor to drive home the important points. Daily sessions include formal presentation interspersed with a good number of questions, discussion and problem solving.

**DESIGNED FOR**

All field, service, support, and supervisory personnel having interaction with Facilities Engineers and desiring to gain an awareness level understanding of the field processing of production fluids. This course is an excellent cross-training and delivers an understanding of all the fundamental field treating facilities.

**YOU WILL LEARN**

- A practical understanding of all the fundamental field treating facilities: what they are, why they are needed, how they work
- The properties and behavior of crude oil and natural gas that govern production operations
- Field processes for treating and conditioning full wellstream production for sales or final disposition
- The basics of oilfield corrosion prevention, detection, and treatment
- Internal workings of separators, pumps, compressors, valves, dehydrators, acid gas treatment towers, and other treating equipment
- A wide range of produced fluid measurement and metering devices
- A description of treating equipment whether located on the surface, offshore platform, or sea floor

**COVERAGE CONTENT**

Properties of fluids at surface • Flowlines, piping, gathering systems: solids and liquid limits • Oil - water - gas - solids - contaminants • Separation and treatment • 2-3 phase separators, free water knockouts, centrifugal, filter • Storage tanks, gun barrels, pressure/ vacuum relief, flame arrestors • Stabilizers • Foams, emulsions, paraffins, asphaltene, hydrates, salts • Dehydrators • Water treaters: SP packs, plate interceptors, gas flotation devices • Separators, coalescers, hydrocyclones, membranes • Acid gas treatment: coolings, closed system, chemicals, solvents, conversion; stress cracking • Valves: all types; regulators; Pumps/ Compressors: centrifugal, positive displacement, rotary, reciprocating, ejectors • Metering: orifice, head, turbine, and others • Corrosion/Scalcs: inhibition and treatment

---

**PETO SKILLS COURSE: VIRTUAL-PTO**

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

**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>$4140</td>
</tr>
<tr>
<td>12-16 AUG 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>16-20 DEC 2018</td>
<td>$5240+VAT</td>
</tr>
<tr>
<td>15-19 DEC 2018</td>
<td>$5335+VAT</td>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>19-23 NOV 2018</td>
<td>$4180</td>
</tr>
<tr>
<td>15-19 NOV 2018</td>
<td>$4260</td>
<td></td>
</tr>
<tr>
<td>MELBOURNE, AUS</td>
<td>24-28 NOV 2018</td>
<td>$4260+VAT</td>
</tr>
<tr>
<td>20-24 NOV 2018</td>
<td>$4260+VAT</td>
<td></td>
</tr>
<tr>
<td>SYDNEY, AUS</td>
<td>1-5 DEC 2018</td>
<td>$4180</td>
</tr>
<tr>
<td>28-30 NOV 2018</td>
<td>$4260</td>
<td></td>
</tr>
<tr>
<td>SAN ANTONIO, US</td>
<td>15-19 JULY 2018</td>
<td>$4170</td>
</tr>
<tr>
<td>12-16 JULY 2018</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>20 MAY - 23 AUG 2019</td>
<td>$4325</td>
</tr>
<tr>
<td>9 SEP - 6 DEC 2019</td>
<td>$4325</td>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>24-28 JUNE 2019</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td>11-15 NOV 2019</td>
<td>$4225</td>
<td></td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>16-20 DEC 2018</td>
<td>$5240+VAT</td>
</tr>
<tr>
<td>2018-19 Schedule and Tuition (USD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>16-20 DEC 2018</td>
<td>$5240+VAT</td>
</tr>
<tr>
<td>15-19 DEC 2018</td>
<td>$5335+VAT</td>
<td></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>5-9 NOV 2018</td>
<td>$4180</td>
</tr>
<tr>
<td>11-15 NOV 2018</td>
<td>$4260</td>
<td></td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>24-28 JUNE 2019</td>
<td>$4935+VAT</td>
</tr>
<tr>
<td>2018-19 Schedule and Tuition (USD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>7-11 OCT 2018</td>
<td>$5345+VAT</td>
</tr>
<tr>
<td>6-10 OCT 2018</td>
<td>$5445+VAT</td>
<td></td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>5-9 AUG 2019</td>
<td>$4325</td>
</tr>
</tbody>
</table>
Unconventional Resources Completion and Stimulation – URCS

FOUNDATION 5-Day

This course will focus on some of the key elements of well completions and stimulation practices as they apply to horizontal wells in tight and unconventional reservoirs. Optimization studies will be shown and used to highlight the importance of lateral length, number of fractures, inter-fracture distance, fracture half-length, and fracture conductivity. These results will be used to discuss the various completion choices such as cased and cemented, open hole with external casing packers, and open hole pump and pray techniques. This course also will address key risks to horizontal wells and develop risk mitigation strategies so that project economics can be maximized. In addition, tight and unconventional gas field case studies will be used to illustrate the application of these design, optimization, and risk mitigation strategies for horizontal wells in tight and unconventional gas reservoirs.

DESIGNED FOR
Petroleum and production engineers, completion engineers, stimulation engineers, geologists, managers, technical supervisors, service and support personnel.

YOU WILL LEARN HOW TO
• Use key multi-disciplinary tools for successful completions and stimulations in unconventional resources
• Understand the importance of geo-mechanics and rock mechanics to the success of transverse multiple fractured horizontal wells in unconventional resources
• Understand unconventional resource play completion options and selection processes
• Apply principles and design of well stimulation treatments in unconventional resources
• Employ critical data needs and collection techniques with minimal operational impact

COURSE CONTENT
Geo-mechanics: what makes an unconventional shale reservoir prospective • Introduction to the completions and multiple fracture stimulated horizontal wells • Horizontal well objectives in Unconventional Reservoirs • Basis of fracture design in horizontal wells • Horizontal well stimulation objectives • Completion planning for horizontal wells • Horizontal well risks and risk mitigation strategies • Horizontal well case histories

Performance Analysis, Prediction, and Optimization Using Nodal Analysis – PO2

FOUNDATION 5-Day

Nodal analysis views the total producing system as a group of components potentially encompassing reservoir rock/irregularities, completions (gravel pack, open/closed perforations, open hole), vertical area changes, restrictions, multi-lateral branches, horizontal/flyt terrain flow lines/risers, integrated gathering networks, compressors, pump stations, metering locations, and market/system rate/pressure constraints. An improper design of any one component, or a mismatch of components, adversely affects the performance of the entire system. The chief function of a system-wide analysis is to increase well rates. It identifies bottlenecks and serves as a framework for the design of efficient field-wide flow systems, including wells, artificial lift, gathering lines and manifolds. Together with reservoir simulation and analytical tools, Nodal analysis is used in planning new field development. Software is used extensively during the class. However, if the attendee chooses not to supply his/her own software, nodal analysis, and gas deliverability planning programs can be provided.

DESIGNED FOR
Production, operations, and reservoir engineers; senior technicians and field supervisors with an engineering background.

YOU WILL LEARN HOW TO
• Apply nodal analysis concepts viewing the total producing system as a whole from the reservoir rock through the completion, well bore and gathering system, to the market while honoring system rate/pressure constraints
• Avoid improper design where any one component, or a mismatch of components, adversely affects the performance of the entire system
• Perform a system-wide analysis to increase well rates by identifying bottlenecks and design an efficient field-wide flow system, including wells, artificial lift, gathering lines, and manifolds
• Use nodal analysis, together with reservoir simulation and analytical tools, for planning new field development

COURSE CONTENT
Nodal Analysis Overview • Inflow Performance: Basics, well-test pros and cons, best models for all well types, IPR curves • Completions: Modeling basics, flow patterns in gravel packs, pressure drop in perforations, gravel packs and wellbore, optimal perforation density • Tubing Performance: Videos of flow patterns, flow dynamics, logging in horizontal wells, slugging and pressure changes in all completion types, friction drop in horizontal wells, unloading techniques and examples • Flowlines: Pressure drop models, bottlenecks in a gathering network, line loops and jumpers, gathering systems • Forecast: Field forecasts, economic optimization, evaluation of options • Artificial Lift: Gas lift design, ESP and other methods basics • Liquid in gas streams, what is a dry gas well, loaded wells, predicting temperatures

NODAL Analysis Workshop – NAW

INTERMEDIATE
Well Inflow/Outflow NODAL Analysis is an integral part of a production or completion engineer’s work scope, and is often applied throughout a well’s life to maximize value - from the beginning of the completion design process through underperforming well diagnostics. This workshop provides a comprehensive overview of this analysis technique, emphasizing real world application through multiple problems from different perspectives.

Upon completion, participants will be able to approach a problem recognizing potential solution methods, prepare data for the analysis, identify sources of error, perform an analysis with industry software, and present a holistic recommendation. Topics related to perforating, components of skin, matching transient test data, outflow limitations, selecting artificial lift, liquid loading, and incorporating fluid PVT properties will be covered.

DESIGNED FOR
Operating Company and Service Company engineers and technical managers responsible for performing or reviewing well systems analysis from at least one perspective (perforating design, tubing sizing, post stimulation evaluation, etc.). Participants should be in a role that requires that they regularly perform or are required to technically review well inflow/outflow analysis.

YOU WILL LEARN HOW TO
• Recognize the application and limitations of traditional well systems analysis
• Identify data requirements for a meaningful analysis
• Accurately model the various components of skin, including perforating
• Assess outflow performance, including liquid loading, tubing constraints, and artificial lift
• Confidently approach well systems analysis from multiple perspectives and select the correct diagnostic strategy for your well conditions

COURSE DESCRIPTION
Well Inflow/Outflow NODAL Analysis is an integral part of a production or completion engineer’s work scope, and is often applied throughout a well’s life to maximize value - from the beginning of the completion design process through underperforming well diagnostics. This workshop provides a comprehensive overview of this analysis technique, emphasizing real world application through multiple problems from different perspectives.

Upon completion, participants will be able to approach a problem recognizing potential solution methods, prepare data for the analysis, identify sources of error, perform an analysis with industry software, and present a holistic recommendation. Topics related to perforating, components of skin, matching transient test data, outflow limitations, selecting artificial lift, liquid loading, and incorporating fluid PVT properties will be covered.

YOU WILL LEARN HOW TO
• Recognize the application and limitations of traditional well systems analysis
• Identify data requirements for a meaningful analysis
• Accurately model the various components of skin, including perforating
• Assess outflow performance, including liquid loading, tubing constraints, and artificial lift
• Confidently approach well systems analysis from multiple perspectives and select the correct diagnostic strategy for your well conditions

COURSE CONTENT
Nodal Analysis Overview • Inflow Performance: Basics, well-test pros and cons, best models for all well types, IPR curves • Completions: Modeling basics, flow patterns in gravel packs, pressure drop in perforations, gravel packs and wellbore, optimal perforation density • Tubing Performance: Videos of flow patterns, flow dynamics, logging in horizontal wells, slugging and pressure changes in all completion types, friction drop in horizontal wells, unloading techniques and examples • Flowlines: Pressure drop models, bottlenecks in a gathering network, line loops and jumpers, gathering systems • Forecast: Field forecasts, economic optimization, evaluation of options • Artificial Lift: Gas lift design, ESP and other methods basics • Liquid in gas streams, what is a dry gas well, loaded wells, predicting temperatures

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>CITY, COUNTRY</th>
<th>DATE/SCHEDULE</th>
<th>TUITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>26-30 AUG 2019</td>
<td>$4270+GST</td>
</tr>
<tr>
<td>DENVER, US</td>
<td>1-5 APR 2019</td>
<td>$4320</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>8-12 OCT 2018</td>
<td>$4340</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>5-7 DEC 2018</td>
<td>$5095</td>
</tr>
<tr>
<td>PITTSBURGH, US</td>
<td>22-26 JULY 2019</td>
<td>$4320</td>
</tr>
<tr>
<td></td>
<td>12-16 AUG 2019</td>
<td>$4345</td>
</tr>
<tr>
<td></td>
<td>1-7 JUNE 2019</td>
<td>$4350</td>
</tr>
<tr>
<td></td>
<td>18-22 NOV 2019</td>
<td>$5345</td>
</tr>
</tbody>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>CITY, COUNTRY</th>
<th>DATE/SCHEDULE</th>
<th>TUITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENVER, US</td>
<td>5-7 DEC 2018</td>
<td>$5095</td>
</tr>
<tr>
<td></td>
<td>18-22 NOV 2019</td>
<td>$5345</td>
</tr>
</tbody>
</table>

TO LEARN MORE, VISIT PETROSKILLS.COM/NODAL-VIRTUAL
HYDRAULIC FRACTURING APPLICATIONS – HFU

INTERMEDIATE 5-Day

The course reviews the basic concepts of hydraulic fracturing and the broad applications of the technique. Fracturing technology benefits and limitations in all types of sandstone and carbonate fracturing treatments. It considers the critical components of the fracturing process, and it expands on the steps and data input requirements to effectively select stimulation candidates, plan, design, and implement hydraulic fracturing treatments. The use of modeling as an important tool to design and analyze treatments, how it can be effectively used in practical applications, and its limitations are explained. In addition to the technical presentation, the course contains many practical exercises and class problems based on case histories.

YOU WILL LEARN HOW TO

• Identify what are the data requirements and steps to implement to properly design hydraulic fracturing treatments
• Evaluate and select stimulation candidates, and apply hydraulic fracturing concepts to various types of reservoir conditions to optimize well productivity
• Recognize opportunities for substantial production improvements by application of effective hydraulic fracturing treatments
• Collect pertinent well data and information to plan, design, implement, and evaluate fracturing treatments for the most common types of reservoirs
• Realize the strengths and limitations of hydraulic fracturing theory as it relates to field applications
• Become an active participant in the different phases of typical hydraulic fracturing treatments

COURSE CONTENT

Introduction to the fracturing process and mechanics • Fracture design concepts and methodologies • Fracturing fluid additives and proppant • Strengths and limitations of fracturing applications • Production increase • Factors involved in field implementation • Acid vs. proppant fracturing • Frac packing concepts • Fracture monitoring and fracture measurement • Evaluation of post-fracture treatment success

ADVANCED HYDRAULIC FRACTURING – AHF

SPECIALIZED 5-Day

This advanced course is designed for those who have a practical understanding of the applications of hydraulic fracturing and want to expand their knowledge. The course will provide the details and discussion of fracturing concepts usually accepted or assumed in fracturing applications. The strengths and limitations of various approaches to fracturing treatment design will be covered. Attendees should leave the advanced course with a better understanding of the hydraulic fracturing process and how it relates to post-fract well performance.

DESIGN FOR

Production, operations, and completions engineers who are actively involved in hydraulic fracturing applications and desire a more in-depth understanding of hydraulic fracturing theory and applied concepts. It is designed for engineers that have some fracturing experience or those who have already attended the PetroSkills intermediate level Hydraulic Fracturing Applications course.

YOU WILL LEARN HOW TO

• Better understand rock properties and rock mechanics related to fracturing applications
• Better understand fracturing fluid mechanics and proppant transport
• More effectively design fracturing treatments through better understanding of factors influencing hydraulic fracturing applications
• Use pre-fract injection test data and real-time fracturing treatment data in fracturing applications to define fracture parameters and improve frac treatment design
• Consider factors influencing post-fracture conductivity and well cleanup
• Realize the strengths and limitations of existing hydraulic fracturing technology and fracture models
• Expand fracturing applications to fit a wider range of reservoir types and conditions

COURSE CONTENT

Rock properties and fracture mechanics related to the fracturing process • Fracturing fluid mechanics • Proppant transport • Pre-fract injection test analysis • Fracture closure • Fracture monitoring and fracture measurement • Fluid leak-off • Re-fracturing considerations • Review of existing fracture modeling software • Evaluation of post-fract well performance

ACIDIZING APPLICATIONS IN SANDSTONES AND CARBONATES – ASC

INTERMEDIATE 5-Day

Although acidizing is the oldest method of well stimulation, it is often applied with mixed results. It remains, however, a valuable tool for improving well productivity. The key to acidizing success is in the understanding of how it works, the optimum conditions for its application, and proper evaluation of well response after the acidizing treatment. The instructor will present many of the practical aspects of acidizing applications and help provide a better understanding of acidizing as a tool for enhancing well performance.

DESIGN FOR

Engineers and other personnel involved with the daily operation and management of producing oil and gas wells; production engineers and reservoir engineers involved with well stimulation applications would also benefit from attending this course.

YOU WILL LEARN HOW TO

• Assess a well’s need for stimulation
• Recognize the strengths and limitations of acidizing
• Investigate production problems from the standpoint of damage removal and improvement in well production
• Assess treatments strategically to improve success
• Approach acidizing applications from a practical viewpoint
• Recognize opportunities for enhancement of acidizing treatments using non-acid fluids

COURSE CONTENT

Well stimulation objectives • Types of formation damage • Influence of skin factor • Production improvement with skin removal • Well stimulation and reservoir management • Perforating techniques and well stimulation • Acidizing for well stimulation • Chemistry of sandstone acidizing • Chemistry of carbonate acidizing • Acid additives • Treatment diversion • Acid fracturing • Rules of thumb • Types of acids • Sandstone acidizing guidelines • Carbonate acidizing guidelines • Re-stimulation of acidized wells • QA/QC in acidizing applications • Safety precautions

---

2018-19 Schedule and Tuition (USD)

**HYDRAULIC FRACTURING APPLICATIONS – HFU**

**INTERMEDIATE 5-Day**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>1-5 OCT 2018</td>
<td>$4340</td>
</tr>
<tr>
<td></td>
<td>7-11 OCT 2019</td>
<td>$4425</td>
</tr>
</tbody>
</table>

**ADVANCED HYDRAULIC FRACTURING – AHF**

**SPECIALIZED 5-Day**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>13-17 MAY 2019</td>
<td>$4425</td>
</tr>
</tbody>
</table>

**ACIDIZING APPLICATIONS IN SANDSTONES AND CARBONATES – ASC**

**INTERMEDIATE 5-Day**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>13-17 MAY 2019</td>
<td>$4425</td>
</tr>
</tbody>
</table>

---

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)

Any course is available inhouse at your location. Contact us today.
Artificial Lift Systems – ALS

FOUNDATION 5-Day
This course blends lecture, hands-on exercises, and seminar teaching styles to enhance learning. Participants work with software that allows them to design and analyze artificial lift systems, which points the way to improved efficiency, higher production and less downtime due to failures. Participants learn how to design and troubleshoot rod pumping, continuous gas lift, and electric submersible pump systems. Other methods such as ESP, jet pump, hydraulic pump, and intermittent gas lift are presented as viable AL techniques. Participants gain experience in solving problems by hand and also by using industry computer software. Troubleshooting is an important part of artificial lift operations and several typical surveillance problems are solved. The class includes pictures and videos of the most important equipment components being applied. The course emphasizes techniques to maximize production. New developments at various stages of application are also covered. A discussion of modifications necessary for horizontal or unconventional wells for all methods of lift is also supplied. Students will understand how these techniques are being applied in producing unconventional wells are presented. Distinct features of all lift methods are presented allowing the attendee to know how to select the best lift for well or field conditions.

DESIGNED FOR
Engineers, technicians, field supervisors, and others who select, design, install, evaluate, or operate artificial lift systems.

YOU WILL LEARN HOW TO
• Techniques to maximize oil production economically with artificial lift systems
• Make basic PVT properties and inflow performance calculations related to artificial lift
• Understand and apply multiphase tubing and flow assurance principles
• Select the appropriate artificial lift system by examining the drawdown potential of each method, the initial and operating expense and the range of production and depth possible with each method; special problems such as sand/outline/deviation etc. are discussed with each method
• Specify components and auxiliary equipment needed for each system
• Know what best practices are available to extend the life of equipment and installed lift systems
• Apply basic design and analysis concepts
• Design and operate system features for each method under harsh conditions

COURSE CONTENT
Overview of artificial lift technology • Criteria for selection of artificial lift system • Reservoir performance: inflow and outflow relationships • Artificial lift screening • Economic analysis includes initial and operating costs, production potential, etc. • 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>8-12 APR 2019</td>
<td>12-16 APR 2019</td>
<td>$4295+GST</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>14-18 OCT 2019</td>
<td>18-22 OCT 2019</td>
<td>$5060</td>
</tr>
</tbody>
</table>

* plus computer charge

Artificial Lift for Unconventional Wells – ALUUW

INTERMEDIATE 5-Day
This course addresses artificial lift methods and practices for unconventional wells for oil and gas producers, as well as associated industry service providers and contractors. The focus of the course is optimizing value from upfront well planning through the end of life of unconventional wells by selecting, installing and operating artificial lift effectively. Upon completion of this course, the participant will understand how to choose and implement artificial lift and be able to utilize best practices to resolve and reduce issues and challenges that frequently occur during the life cycle of unconventional wells. The course focuses on optimizing production and recovery by ensuring the proper artificial lift technology is used in conjunction with optimum surface pressure and related facilities in a holistic approach. Participants will understand the steps necessary to develop an effective artificial lift strategy for wells specific to areas/plays. All participants will be asked to bring a challenge they are currently facing in artificial lift for unconventional wells and will present the challenge (Day 2) and their path forward based on what they have learned (Day 5).

DESIGNED FOR
Production and artificial lift engineers. It will be valuable for engineers (working for operators, service companies or as consultants) who may have artificial lift knowledge on conventional wells or individual lift methods that want to expand their ability to deliver more optimal holistic artificial lift solutions specific to unconventional wells and the latest practices.

YOU WILL LEARN HOW TO
• The importance of identifying and agreeing on the objectives of production optimization and artificial lift early in the well planning cycle
• The critical differences and requirements for applying artificial lift to unconventional vs. conventional wells
• The effect of changing Inflow Performance Relationship (IPR) over time, how to construct and profitably use relevant IPR curves
• Benefits and challenges of applying Systems Nodal Analysis in artificial lift for unconventional wells
• The strengths and weaknesses of each major artificial lift method used
• Challenges and issues in operating artificial lift and how to troubleshoot/mitigate them
• How to select an effective artificial lift method for individual wells
• How to analyze staging of artificial lift methods over time to enhance value
• and more...

COURSE CONTENT
Artificial lift objectives, value, rate and recovery, cost • Differences between conventional and unconventional wells • Applying Nodal Analysis for artificial lift selection in unconventional wells • 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>DENVER, US</td>
<td>1-5 APR 2019</td>
<td>5-9 APR 2019</td>
<td>$4320</td>
</tr>
<tr>
<td>MIDDLETOWN, US</td>
<td>25 FEB – 1 MAR 2019</td>
<td>29 MAR – 2 APR 2019</td>
<td>$4270</td>
</tr>
<tr>
<td>OKLAHOMA CITY, US</td>
<td>15-19 JUL 2019</td>
<td>19-23 JUL 2019</td>
<td>$4270</td>
</tr>
</tbody>
</table>

* plus computer charge

Beam Pumps – BP

INTERMEDIATE 5-Day
This course will allow the user to become familiar with the beam pump system and when it should be used. It has been said that beam pumping is the most economical form of artificial lift and should be used when it is economically possible. It is the most common form of lift compared to ESP/ Gas Lift/ Hydraulic/ PCP pumps. All components will be described in detail including the prime mover, well/ sleeve/ wellhead/ stuffing box, sucker rods/ sinner bars and downhole pumps. Design and analysis will be done using industry computer software. Films will be shown mostly illustrating either new products or best practices. A few problems will be solved by class participants each day. Comparisons with other systems to select the best system for a given well, whether it may be beam pumping or another method of lift; example problems will also be shown throughout the class. Problems addressing solids, gas handling, and viscosity are addressed. Best practices are stressed throughout so that a long lasting system can be developed for maximum profit. New material will also be presented on beam pumps and rod protection in horizontal wells, placement of pump, deviation surveys, and performance of gas separators. New methods of deepening the point of intake for horizontal and unconventional wells are presented with field case. One personal computer is provided, at additional cost, for every two participants.

DESIGNED FOR
Engineers and field technicians who are responsible for selecting, designing, and maintaining of beam pumping systems

YOU WILL LEARN HOW TO
• Design for best efficiency, economical optimum production, longer life between failures, best energy efficiency and safe operating conditions considering field constraints
• Maintenance and monitor using POC’s (proroff and VSD types)
• Identify components of the system and select optional components for best operation
• Chemicals
• Design and analyze a system using computer software
• Monitor with SCADA systems
• Apply best practices for longer system life

COURSE CONTENT
Reservoir considerations • Overview of artificial lift • Design and analysis of the beam pump system • Prime mover • Belts • Sheaves • Gear box • Unit • Polished rod • Wellhead / stuffing box • Rods • Pump • Tubing • Artificial lift efficiency • Heavy oil considerations • Gas separation/handling • Best practices for operation • Component design • System analysis • Pump off controllers

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>MIDLAND, US</td>
<td>8-12 OCT 2018</td>
<td>12-16 OCT 2018</td>
<td>$4290</td>
</tr>
<tr>
<td>OKLAHOMA CITY, US</td>
<td>26 OCT – 1 NOV 2018</td>
<td>30 OCT – 3 NOV 2018</td>
<td>$4370</td>
</tr>
</tbody>
</table>

* plus computer charge
Our Participants Say It Best.

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

JESSICA       BASIC GEOPHYSICS • BGP • HOUSTON

“I the instructor provided a holistic and comprehensive perspective to the course material. He was very engaging, and taught with clarity through demonstrations.”

DEREK        BASIC DRILLING, COMPLETION AND WORKOVER OPERATIONS • BDC • BAKERSFIELD

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

RAJR        PERFORMANCE ANALYSIS, PREDICTION AND OPTIMIZATION USING NODAL ANALYSIS • POZ • DUBAI

Listen to what course attendees are saying! Go to petroskills.com/listen

PetroSkills

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)

Any course is available inhouse at your location. Contact us today.

Gas Lift – GLI

INTERMEDIATE 5-Day

Gas lift is one of the most widely used artificial lift techniques. Participants will investigate the impact of tubing sizing, gas lift valve selection, gas lift mandrel spacing, gas lift valve design, casing pressure, surface choke size, gas volume, etc., on well design and operation. Participants practice mandrel spacing design and gas lift valve design, surveillance, and optimization at the well and field level using actual field data including the use of software programs. After attending this course, participants will be able to identify, diagnose, analyze, and solve gas lift problems. Computer software will be used/demonstrated during the course. The class includes pictures and videos of most important equipment components while being applied, to further participant understanding. The course emphasizes techniques to maximize production. New developments at various stages of development and application are also covered.

DESIGNED FOR

Production engineers and operations staff responsible for designing gas lift installations and/ or performing surveillance and optimization on wells using gas lift; appropriate for staff at all levels of gas lift expertise and has been given with good results to both production engineers new to gas lift as well as industry gas lift consultants.

YOU WILL LEARN HOW TO

• Select the appropriate gas lift systems and equipment
• Design continuous-flow gas lift systems
• Analyze operating gas lift systems
• Increase production from your wells using gas lift technology and optimization
• Improve the economics of gas lift operation

COURSE CONTENT

Gas lift concepts and data • Inflow/Outflow • Nodal analysis • Equilibrium curves • Gas lift equipment and valve mechanics • Valve selection and calibration • Unloading • Mandrel spacing and step-by-step, complete gas lift design for a well • Temperature effects on valves • Determine the Pts • Orifice sizing techniques • Lift gas rates for best economics • Causes and solutions of instability • Gas lift surveillance and measurement • Analysis of flowing pressure gradient surveys • Analysis of GL surface charts and measurements • Gas allocation and field optimization • Use of computer software for gas lift design, troubleshooting, and optimization

Plunger Lift – PLS

INTERMEDIATE 5-Day

There are about 400,000 gas wells in the USA and most are liquid loaded. Solving this problem may increase production as much as —40%. Plunger lift is a very popular method of gas well dewatering as it is initially inexpensive and can last a long time with no outside energy required for most wells. The components of plunger systems are described and the cycles of each method are shown in detail and tools for analysis are provided to participants. Methods of analysis include analysis by shape of the SCADA traces of CP, TP, rate, and LP. Also, analysis of the cycles is facilitated by use of a provided spreadsheet that allows determination of the cycle slug size, the CP required to lift it at the correct speed, the minimum time for shut-in for the plunger to fall, the maximum liquid possible, the cycle times, and other information on the plunger cycle. Proven methods of how to adjust cycles to increase production is presented. Other details of plunger lift operation are presented with the focus on trouble free cycles and more gas production. Continuous (bypass), conventional, gas assisted and casing plunger lift are presented. Special equipment and techniques used in unconventional or horizontal wells are discussed. The course will consist of slide presentations, example problems, and discussion. A few videos will be shown. Some programs and SS will be distributed to the participants. Effects of deviation on operation are presented. One personal computer is provided, at additional cost, for each two participants...

DESIGNED FOR

Engineers and field technicians that design, operate, monitor, and optimize plunger lift operations.

YOU WILL LEARN HOW TO

• Recognize liquid loading in a gas well using field symptoms, using critical velocity, and nodal analysis. Use of decline curve is presented.
• Understand the advantages and disadvantages of various methods, including plunger, and under what conditions each one works best
• Apply, design, and diagnose continuous plunger lift and conventional plunger lift
• Increase production when operating plunger lift
• Know when conventional plunger ceases to work, what are other workable plunger related systems to switch to for continued production
• Recognize important considerations for unconventional and horizontal wells

COURSE CONTENT

Introduction of loading, solution methods • Comparison of various AL methods to drawdown capabilities • Continuous Plunger Lift • Conventional Plunger Lift • Trouble shooting using decline curves, SCADA traces, and cycle set points • Drawdown capability of plunger lift • PPRs for plunger lift • Systems used to track plunger in the well • What systems to use when conventional plunger no longer works

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUBAI, UAE</td>
<td>1-5 SEP 2019</td>
<td>$5570+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>17-21 SEP 2018</td>
<td>$4355</td>
</tr>
<tr>
<td></td>
<td>8-12 APR 2019</td>
<td>$4450</td>
</tr>
<tr>
<td>MIDLAND, US</td>
<td>15-19 JULY 2019</td>
<td>$4395</td>
</tr>
</tbody>
</table>

* plus computer charge

See website for dates and locations.
Flow Assurance for Offshore Production – FAOP

INTERMEDIATE 5-Day

Flow assurance is a critical component in the design and operation of offshore production facilities. This is particularly true as the industry goes deeper to water, longer tiebacks, deeper wells, and higher temperatures and pressure reservoirs. Although gas hydrate issues dominate the thermodynamic design, waxes, asphaltene, emulsions, scale, corrosion, erosion, solids transport, slugging, and operability are all important issues which require considerable effort. The participant will be presented with sufficient theory/correlation information to be able to understand the basis for the applications. This intensive five-day course has considerable time devoted to application and design exercises to ensure the practical applications are learned.

DESIGNED FOR

Engineers, operators, and technical managers who are responsible for offshore completions, production, and development; technical staff needing a foundation in principals, challenges, and solutions for offshore flow assurance. The course is also appropriate for persons involved in produced fluids flow in onshore production operations.

YOU WILL LEARN HOW TO

• Identify the components of a complete flow assurance study and understand how they relate to the production system design and operation
• Interpret and use sampling and laboratory testing results of reservoir fluids relative to flow assurance
• Understand the basics properties of reservoir fluids and how they are modeled for the production flowline system
• Understand the thermodynamic modeling of steady state and transient multiphase flow in offshore production systems
• Evaluate and compare mitigation and remediation techniques for: gas hydrates, paraffin (waxes), asphaltene, emulsions, scale, corrosion, erosion and solids transport, and slugging
• Understand the elements of an operability report for subsea production facilities, flowlines, and export flowlines

COURSE CONTENT

Overview of flow assurance • PVT analysis and fluid properties • Steady state and transient multiphase flow modeling • Hydrate, paraffin, and asphaltene control • Basics of scale, corrosion, erosion, and sand control • Fluid property and phase behavior modeling • Equations of state • Fugacity and equilibrium • Viscosities of oil • Thermal modeling • Multiphase pressure boosting • Slugging: hydrodynamic, terrain induced, and ramp up • Commissioning, start-up, and shutdown operations

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>10-14 SEP 2018</td>
<td>$4990+HVT</td>
</tr>
<tr>
<td>CALGARY, CANADA</td>
<td>3-7 JUN 2019</td>
<td>$4370+GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>4-8 MAR 2019</td>
<td>$4425</td>
</tr>
<tr>
<td>KUALA LUMPUR, MYS</td>
<td>3-7 DEC 2018</td>
<td>$5170</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29-24 MAY 2019</td>
<td>$5135+VAT</td>
</tr>
<tr>
<td>PERTH, AUS</td>
<td>9-13 DEC 2018</td>
<td>$5340+GST</td>
</tr>
</tbody>
</table>

* plus computer charge

Any course is available inhouse at your location. Contact us today.

1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Scale Identification, Remediation and Prevention Workshop – SIR

PetroSkills PetroAcademy™

INTERMEDIATE

Scale Identification, Remediation and Prevention is an essential part of a production or workover engineer’s scope of work. This workshop provides a comprehensive overview of dilemmas in operating producing and injection wells relating to the presence of a variety of oilfield scale types – primarily reduction in pipe carry capacity and localization of corrosion attack – deposition mechanisms, identification methods, various removal techniques and methodologies for its prevention. Upon completion, participants will be aware of the scale problem, understand ways to remediate it and prevent it subsequent deposition. Specific aspects of scale prediction methods are presented and numerous preventive methods, both chemical and unique approaches, are covered.

DESIRED FOR

Asset managers, drilling and completion engineers, petroleum engineers and geologists, independent producers, production managers and engineers, reservoir managers and engineers, field supervisors, company executives and officials, field personnel with operating and service companies. Participants should have at least one year of operations-related experience and be in a supervisory or support role.

YOU WILL LEARN ABOUT

• How to determine scaling potential and the solubility of various scales
• Two principle methods for scale identification and recognize various methods and their application for removing scale depending on its composition
• Precipitation tendency variables and locations for various scale deposits – especially iron and be familiar with three mathematical models that predict scaling, including a popular software program
• How to properly prevent and inhibit scale formation and deposition using various methods

COURSE CONTENT

Overview scale, water and deposition☆
Scaling potential: Factors affecting deposition☆
Scale identification and removal☆
Scaling tendency/Li: Scale R scaleSoftPitzer software☆
Scale prevention and inhibition☆

2018-19 Schedule and Tuition (USD)

VIRTUAL

8-24 APR 2019 $1630
VIRTUAL

10-26 SEP 2019 $1630

Production Chemistry – OGPC

INTERMEDIATE

5-Day

This course covers the selection and use of chemicals in oil and gas production. As oilfields mature more water is produced which requires the use of more chemicals to maintain production. Chemicals used for controlling corrosion, emulsions, foaming, mineral scales, paraffins (waxes), asphaltenes, gas hydrates, hydrogen sulfide scavengers, and water clarifiers are covered. The course includes methods to determine the need for chemical treatment, how to select the proper chemicals, and how testing for chemical compatibility with the formation and other chemicals is performed. Requirements for environmentally friendly products and products for deep water production are discussed. The course will include how the use of chemicals can prevent problems, improve production and economics, and extend the life of the production equipment. This course can be offered on an in-house basis with expansion of some sections and deletion of others to suit the needs of individual clients.

DESIRED FOR

Production engineers, facilities engineers, chemists, and technicians involved with production systems from the wellbore through the topside production equipment, transmission pipelines, and storage facilities are responsible for recognizing and treating problems which might require treatment chemicals.

YOU WILL LEARN HOW TO

• Recognize corrosive conditions and monitor corrosion rates
• Select and apply corrosion inhibitors
• Predict and treat emulsions
• Understand causes and control of foaming
• Predict scale forming conditions
• Select and apply scale inhibitors
• Control gas hydrate formation
• Predict and control paraffin (wax) deposition
• Evaluate methods for asphaltene control
• Scavenge low concentrations of H2S
• Select and apply water clarifiers
• Select chemicals for use in deep water
• Select environmentally friendly chemicals

COURSE CONTENT

Corrosive agents☆
Corrosion inhibitor selection and application☆
Predicting and monitoring corrosion rates☆
Basics of oilfield emulsions☆
Demineralizer selection and field application☆
Foams☆
Defoamers☆
Foam basics☆
Field application of foams☆
How do defoamers work☆
Compounds that cause scaling☆
Prediction of scaling tendency☆
Scale inhibitors☆
Solvents to dissolve scales☆
Requirements for gas hydrates to form☆
Types of compounds used to control hydrate formation☆
Causes of paraffin (wax) problems☆
Paraffin treatment chemicals☆
Asphalten stability tests☆
Asphaltene treatment chemicals☆
Chemicals used as H2S scavengers☆
Application of H2S scavengers☆
Oil carver in water☆
Removal of oil and oily solids☆
Tests required for chemicals used in deep water☆
Green chemicals (environmentally friendly chemicals)

2018-19 Schedule and Tuition (USD)

DUHAI, UAE
7-11 OCT 2018 $4205
11-15 MAR 2019 $5445
10-14 DEC 2018 $4340
16-20 DEC 2018 $4425

HOUSTON, US
14-18 OCT 2018 $5330
24-28 JUNE 2019 $4425
9-13 AUG 2019 $5330

Production Logging – RMP

INTERMEDIATE

5-Day

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

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

COURSE CONTENT

Wellbore environment and tool deployment considerations☆
Depth control issues and natural gamma ray logging☆
Cement bond logs☆
Ultrasonic imaging logs☆
Conventional temperature logs☆
Conventional spinner (flowmeter) logs☆
Conventional fluid oilup logs☆
Gamma density☆
capacitance☆
and resistance☆
Temperature☆
from fiber optic cable☆
Pulsed neutron capture logs☆
Multi-phase flow☆
and slip velocity☆

2018-19 Schedule and Tuition (USD)

HOUSTON, US
10-14 DEC 2018 $4340
16-20 DEC 2018 $4425

Sand Control – SNDC

INTERMEDIATE

5-Day

Sand causes a wide variety of costly problems when oil and gas are produced from unconsolidated reservoirs. The most costly problem is usually the loss of production resulting from formation damage caused by poorly planned and/or executed sand control applications. This course will identify the parameters that must be considered when selecting the sand control technique to be used. Examples, problems, and case histories will be examined to illustrate key points. Sand control failures will be used to illustrate the types of problems that can lead to early well failures. The course will also teach how to perform quality control checks during the sand control application to help insure successful wells. Because Sand Control in horizontal wells often proves to be short-lived when incorrectly applied, examples and class problems will focus on correctly choosing successful completion techniques for horizontal wells. Several new promising sand control technologies have been introduced in the last few years, such as expandable screens of different sub-types. The proper application of these new technologies will also be covered. Attendees will leave this course with a thorough understanding of what is necessary to design and implement cost-effective sand control in both producing and injection wells.

DESIRED FOR

Drilling, completion, production, and research engineers; field supervisors and production foremen; technical personnel who supply services and equipment.

YOU WILL LEARN HOW TO

• Determine the causes of sand production☆
• Determine the need for sand control☆
• Select the best sand control method☆
• Prepare the well for the proper application of sand control☆
• Apply best practices to ensure successful sand control completions☆
• Conduct successful frac packs☆
• Evaluate sand control performance☆
• Minimize production losses☆
• Evaluate new technologies for proper applications

COURSE CONTENT

Sand control techniques☆
Radial flow and formation damage☆
Causes and effects of sand production☆
Predicting sand production☆
Gravel pack design☆
Slotted liners and wire wrapped screens☆
Gravel pack completion equipment and service tools☆
Well preparation for gravel packing☆
Perforating for gravel placement techniques☆
Perforation prepping and enhanced prepping☆
Frac packing☆
Open hole gravel packing☆
Expandable screens☆
Gravel pack performance☆
Horizontal well completions☆
Surface Water Management in Unconventional Resource Plays – SWM

INTERMEDIATE 3-Day

Water management in unconventional resource plays has become a critical topic to the oil and gas industry in the last decade. In order to establish and implement an optimized water management plan for hydraulic fracturing operations, operators and service companies need an understanding of a broad array of subjects, including water chemistry, systems modeling, water treatment technology, the regulatory landscape, and best practices for field operations. This course first establishes a foundation of knowledge regarding water awareness, water chemistry, fluid dynamics, and water analysis tools. Upon this foundation the course will build a model for optimizing water management in support of hydraulic fracturing operations, providing reviews of best practices and the latest industry technology, while always considering key stakeholders. This course is designed for the practitioner, for the people who will design and implement all or part of a water management plan in unconventional resource plays.

Designed For
Production, completion, operations, and surface facilities engineers; operations managers, logistics coordinators, field superintendents; any personnel involved in establishing, improving, or supervising the implementation of an organization’s water management plan; personnel in service organizations seeking a more thorough understanding of the water system in unconventional resource plays.

You Will Learn How To
- Design and implement a water management plan for an unconventional resource play
- Assess the regional hydrological cycle in the operational area
- Adopt emerging best practices regarding water management
- Establish a water sampling and analysis program
- Design and run a water treatment technology pilot test
- Find the lowest cost solution for sourcing fluid for hydraulic fracturing operations
- Select a water treatment technology for a project
- Manage the primary service/equipment providers critical to water management
- Establish basic water quality requirements necessary for frac fluid
- Build a water management plan that complies with regulations
- Build a water management cost model to use as a tool to optimize water management

Course Content
Global water awareness and the oil and gas industry’s impact • Flowback and produced water • Basic water chemistry focused on oilfield concerns • Water quality considerations for hydraulic fracturing operations • Water sampling and analysis, in the field and in the lab • Water treatment for reuse and recycling programs • Acquisition, storage, transportation, disposal, and treatment of water • Holistic field water management • Regulations applicable to water management • Water management system cost modeling

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITTSBURGH, US</td>
<td>10-12 SEP 2018</td>
<td>$3220</td>
</tr>
<tr>
<td></td>
<td>9-11 SEP 2019</td>
<td>$3295</td>
</tr>
</tbody>
</table>

Water Management in Heavy Oil Resource Operations – HOWM

INTERMEDIATE 3-Day

This course will review basics of heavy oil extraction, characteristics, quantities, and typical ratios of waters in heavy oil extraction. It will review alternative discharge limitations, offshore discharge, and treatment for well injection. Suspended and oil/crude separation, with traditional and new equipment, will be covered. The course will review the scientific basis and principles of softening, lime softening (hot, warm, including sludge disposal), strong acid exchange (SAC), weak acid exchange (WAC), ion exchange, boiler feed water chemistry (including once through steam generator), and cooling tower bases. Technologies for produced water recovery will be discussed.

Designed For
Central processing facility operators and process engineers dealing with heavy oil produced water separation, recovery, and treatment for reuse or disposal. Personnel involved in establishing, improving, optimizing, or supervising the implementation of technology improvements. This course will be useful to managers in production, production, and optimization of operations. The course is a great reference parameter for water technologies in mining and heavy industry, with some examples of cases and treatment for discharge and spills.

You Will Learn How To
- Understand and analyze technology options, advantages, and limitations
- Choose the most advantageous technology given the site conditions
- Design or specify the equipment capable to fulfill the operations intended
- Optimize design conditions and operating efficiency
- Choose suppliers when comparing basic principles and design
- Synthesize and define the applicability conditions of technologies
- Troubleshoot field situations, learned from field cases, discussions, and debates in class
- Understand water mass and ionic/solids balance
- Estimate and calculate equipment requirements, predesign and specify equipment
- Predict efficiencies or performance of equipment, anticipate remediation of spills

Course Content
Heavy oil review and basic definitions, heavy oil around the globe • Thermo-extraction produced water, the process (SAGD and CSS) ratios • Declining technologies, traditional, deviations, and future • Alkalinity and hardness concepts, softening and silica removal, hot and warm lime softening • Ion exchange softening technology, SACs and WACs technologies, the in and out of vessel regeneration • Boiler feed water final treatment, standard requirements and chemical conditioning • Evaporator alternatives and zero liquid discharge technology • Mining bitumen extraction, tailings pond, process affected waters, their treatment and reuse • Cooling tower requirements, water conditioning, and treatments • Deep well injection of waste water: requirements and 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>3-7 DEC 2018</td>
<td>$4460</td>
</tr>
<tr>
<td>OKLAHOMA CITY, US</td>
<td>16-20 MAR 2019</td>
<td>$4525</td>
</tr>
<tr>
<td></td>
<td>17-21 SEP 2019</td>
<td>$4390</td>
</tr>
<tr>
<td></td>
<td>7-11 OCT 2019</td>
<td>$4470</td>
</tr>
</tbody>
</table>

Applied Water Technology in Oil and Gas Production – PF21

FOUNDATION 5-Day

This course provides an overview of the main water handling systems typically encountered in upstream (E&P) production operations, both onshore and offshore. The chemistry of the main water-related problems of mineral scales, corrosion, bacteria, and oily water will be reviewed both from the theoretical and practical aspects. Produced water treatment equipment and typical water quality specifications will also be reviewed, as well as water injection and disposal systems. An exercise will be given to identify typical system problems and to apply the knowledge gained to propose solutions.

Designed For
Managers, engineers, chemists, and operators needing to understand water-related problems in oil and gas production and their solutions.

You Will Learn
- The basics of oilfield water chemistry
- How to monitor and control corrosion, scale, and bacterial growth in produced water and water injection/disposal systems
- How to implement system surveillance programs to detect potential problems before system damage occurs
- Produced (oily) water treatment options and related treatment equipment
- How to use the knowledge gained to identify typical system problems and be able to propose solutions

Course Content
Water chemistry fundamentals • Water sampling and analysis • Water formed scales • Corrosion control • Water treatment microbiology • Produced water discharge/ disposal and treatment principles • Produced water treatment equipment - theory of operation, advantages and disadvantages, and the importance of oildrop size • Water injection and disposal systems - theory of operation, corrosion, scale, and biological control • Case study

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>19-23 AUG 2019</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>1-3 APR 2019</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>
Competent Person Fall Protection – FPST

BASIC

This comprehensive training program is for anyone who develops or impacts fall protection policy, as well as those involved with design practices, facility or product modifications and equipment procurement. The goal of training is to provide participants with the knowledge to solve fall protection issues before they arise. Attendees will acquire the tools required to become certified OSHA competent persons and the skills to develop and implement a comprehensive, cost-effective and attainable fall protection system. The course provides interactive instruction, multimedia resources, and knowledge check that have been developed to train attendees to the competent person level.

DESIGNED FOR

This course is intended for safety directors, safety professionals, fall protection program administrators, managers, facility engineers, production supervisors, and maintenance supervisors.

YOU WILL LEARN

- To recognize myths and facts surrounding fall protection
- To describe how fall protection fits into the core elements of your safety program
- To determine the key resources for identifying fall hazards
- To rank abatement options using objective criteria
- Regulatory requirements for access, surfaces, and edge protection
- About lift equipment including requirements for vacuuming or entering an aerial lift
- The regulations and standards for scaffolding
- How to minimize the dangers of falling objects
- About the initial ANSI fall protection standards and the new ones within the 2590 family
- The difference between certified and non-certified anchorage
- How to recognize how ANSI applies to various equipment components
- How to inspect fall hazard equipment
- About typical roof fall hazards
- About fall clearances including sample fall clearance calculations
- To identify the elements of a horizontal lifeline system and recognize the pitfalls
- The importance of preplanning a fall protection rescue as a part of a pre-task plan
- To develop a rescue procedure for a specific personal fall arrest system

COURSE CONTENT

Fall protection program overview • Fall hazard risk assessment • Fall hazard abatement • Engineering controls • Lift equipment • Scaffolding • OSHA requirements and ANSI standards • Equipment inspection • Roof fall protection • Fall clearances • Anchorage • Horizontal lifelines • Rescue

Applied Environmental Management Systems – AEM

FOUNDATION

NEW

Since the Rio de Janeiro Earth Summit (UNCED) held in 1992, environmental issues have been drawn to the forefront of organizations’ operations and possibly their reputations. A review of the world’s press often reveals spillages, toxic releases, fires, and other pollution events. There are efficiency opportunities from better use of energy, water and from reducing waste in a systematic way. Participants will receive a template Environmental Management System (EMS) manual for their own use as part of the study materials. This class provides a complete review of the international standard for environmental management, ISO 14010, 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, HAS 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 • OH&S policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities • Objectives and planning to achieve them • Support (compliance, awareness, communication, documentation) • Operational control • Emergency preparedness and response • Monitoring, measurement, analysis, and evaluation • Internal audit • Management review • Improvement

Management Systems Lead Auditor – AUD

INTERMEDIATE

NEW

Our Lead Auditor course provides a rigorous approach to conducting a risk-based internal audit of any structured means of control aligned to the international standard guidance ISO 19011. We use ISO 14001 (environment) and ISO 45001 (health and safety) as reference frameworks, but our approach could be applied to ISO 9001 (quality) or your own organization’s management systems. A copy of the best-selling book Health and Safety, Environment and Quality Audits – A Risk-Based Approach is included for each participant. For the duration of the class, participants are assigned to a 5–6-person audit team, led by an experienced Lead Auditor. This course allows participants to relate audit to the essential principles of corporate governance and risk management. It also adds value for senior management from the auditing process through provision of a high-level, future-focused opinion. 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

New management system auditors, experienced auditors aspiring to progress to Lead Auditor status, department managers wanting to understand the audit process or to secondment to an internal audit team.

YOU WILL LEARN HOW TO

- Lead participant in an audit or review in line with the standards of the auditing profession, including ISO 19011
- Initiate an internal audit
- Prepare a risk-based audit plan to steer the conduct of any audit
- Conduct audit fieldwork including the necessary reviews and tests to substantiate findings
- Report the audit results and present to senior management

COURSE CONTENT

Risk management and business control • Principles of auditing (ISO 19011) • Initiating and planning a management systems audit • Review and test • Effective interview skills • Legal and ethical aspects of auditing • Developing audit findings and writing recommendations • Reporting audit results and following up

2018-19 Schedule and Tuition (USD)

BAKERSFIELD, US

10-14 DEC 2018 $4090

9-13 DEC 2019 $4170

DUBAI, UAE

20-24 OCT 2019 $5345 + VAT

HOUSTON, US

22-27 SEP 2019 $4225

LONDON, UK

26-30 NOV 2018 $4798 + VAT

18-22 NOV 2019 $4935 + VAT

PITTSBURGH, US

13-17 MAY 2019 $4220

See website for dates and locations.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)

Any course is available inhouse at your location. Contact us today.
**Fundamentals of Process Safety – PS2**

**FOUNDATION 5-Day**

The course will cover the fundamentals of Process Safety for all staff levels of processing facilities in the upstream and downstream oil, gas, and petro chemical industry. To identify how different disciplines and roles can have an impact on Process Safety performance, there is a rolling case study (Project COLEX) throughout the course that involves the installation of a separator vessel, and the Process Safety considerations and implications are explored and discussed at the various stages, from design to full operation.

**DESIGNED FOR**
The course will benefit all staff associated with the operation, maintenance, and governance in production and processing facilities and is relevant to roles, including senior management, project and engineering support teams, HSE support, supervisors, and operator and maintenance technicians. It provides an understanding of the design basis and essentials for safe operations, without addressing the more detailed calculation aspects covered in Process Safety Engineering PS4.

**YOU WILL LEARN HOW TO**
- Identify the systems and processes required to create process safety in a high hazard installation
- Identify and choose appropriate techniques and tools to qualitatively assess process hazards
- Determine appropriate risk reduction strategies and identify effective risk reduction measures to prevent, control, and mitigate process safety risk
- Recognize and develop systems to manage Process Safety in operations through operating procedures and operating limits, ensuring plant integrity through maintenance and inspection
- Use a management of change process to minimize risk of change
- Identify and monitor key performance measures and verifications to maintain and improve safety performance

**COURSE CONTENT**
Business context for Process Safety • Risk assessment (hazard identification, hazard scenarios, consequence & likelihood analysis, and risk analysis and tools & techniques) • Risk reduction measures (barriers) [types and hierarchy of risk reduction measures (barriers)] • Management of process safety in operations (operating procedures, design and operating limits, human factors, inspection and maintenance, and emergency response) • Management of change • Learning from previous incidents and near misses • Self-verification and measurement • Process safety key performance indicators • Management review and auditing • Process safety leadership and culture

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENVER, US</td>
<td>22-26 JUL 2019</td>
<td>$4320</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>24-28 NOV 2019</td>
<td>$5445+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>8-12 OCT 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>30 SEP-4 OCT 2019</td>
<td>$4255</td>
</tr>
<tr>
<td></td>
<td>26-30 NOV 2018</td>
<td>$4090+VAT</td>
</tr>
<tr>
<td></td>
<td>25-29 NOV 2019</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>

**Risk Based Process Safety Management – HS45**

**FOUNDATION 5-Day**

This course introduces process safety management in the oil and gas industry, the elements and benefits of process safety management systems, and tools for implementing and managing a system. In this course the participant will learn to use tools and techniques for managing process safety. The Center for Chemical Process Safety’s (CCPS) book titled “Guidelines for Risk Based Process Safety” or “RBPS Guidelines” will be the text for this course. Participant centered exercises and selected case studies will be used to build on the concepts that CCPS advocates for risk based process safety.

Throughout the course, participants will be challenged to think how their process safety management system can be enhanced and modified to meet the concepts of risk-based decision making. An individual action plan will be developed to apply the information from the course to the workplace.

**DESIGNED FOR**
HSE professionals, operations and maintenance technicians, engineers, supervisors and project managers requiring a basic foundation in developing and managing process safety. The more technical aspects of process safety engineering are covered in PS4, Process Safety Engineering.

**YOU WILL LEARN HOW TO**
- Identify processes applicable to Process Safety Management (PSM) and describe relevant terms used
- Identify which standards are to be applied for managing process hazards
- Apply programs and tools for managing a PSM system
- Choose appropriate decision making methods and tools to identify process hazards
- Describe and use techniques available for control of hazards associated with process designs
- Describe the criteria and methods of selecting equipment and safe guarding controls
- Research and apply the performance parameters for the safety systems in operations
- Explain the role of all disciplines and their contribution to the management of potential HSE hazards

**COURSE CONTENT**
Process safety culture and competency • Compliance with standards • Understand hazards and risk • Operating procedures and safe work practices • Asset integrity and reliability • Management of change • Conduct of operations • Incident investigation (associated with plant failures) • Measurement and metrics • Management review and continuous improvement

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUBAI, UAE</td>
<td>7-11 OCT 2018</td>
<td>$5340+VAT</td>
</tr>
<tr>
<td></td>
<td>6-10 OCT 2019</td>
<td>$5440+VAT</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>8-12 APR 2019</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>29 JUL-2 AUG 2019</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>

For more information, please visit www.petroskills.com/elearning or email solutions@petroskills.com

How can you minimize health, safety, security and environment risks—anytime, anywhere?

PetroSkills ePilot™ HSSE Library can help you:
- Identify knowledge gaps quickly and generate pathways to proficiency

**ONLINE HSSE LIBRARY**

Many employers are struggling with limitations on their training resources. Yet the need to stay up-to-date with safety and regulatory mandates is critical. A single gap in knowledge can seriously jeopardize every safety and quality improvement effort and a company’s good standing with regulatory compliance agencies.

- Achieve compliance goals with compliance-focused management and reporting
- Reduce time-to-proficiency, enable refresher training, and improve on-boarding
- Reduce expenses of classroom scheduling, travel, and instructor fees

For more information, please visit www.petroskills.com/elearning or email solutions@petroskills.com

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
## Extend Learning into the Field

For full list of field trip courses, see [petroskills.com/geoexpro](http://petroskills.com/geoexpro)

<table>
<thead>
<tr>
<th>PG</th>
<th>2018 COURSES WITH FIELD TRIPS</th>
<th>LOCATION</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>ANALYSIS OF STRUCTURAL TRAPS IN EXTENSIONAL SETTINGS - ESS</td>
<td>Las Vegas, US</td>
<td>1-5 Oct 2018</td>
</tr>
<tr>
<td>18</td>
<td>BASIC DRILLING TECHNOLOGY - BDT</td>
<td>Houston, US</td>
<td>16-20 Jul 2018</td>
</tr>
<tr>
<td>18</td>
<td>BASIC DRILLING TECHNOLOGY - BDT</td>
<td>Houston, US</td>
<td>26-30 Nov 2018</td>
</tr>
<tr>
<td>21</td>
<td>CEMENTING PRACTICES-CEMENTING II - CEP</td>
<td>Houston, US</td>
<td>29 Oct-2 Nov 2018</td>
</tr>
<tr>
<td>21</td>
<td>PRIMARY CEMENTING-CEMENTING I - PCE</td>
<td>Denver, US</td>
<td>31 Jul-3 Aug 2018</td>
</tr>
<tr>
<td>21</td>
<td>PRIMARY CEMENTING-CEMENTING I - PCE</td>
<td>Houston, US</td>
<td>22-25 Oct 2018</td>
</tr>
<tr>
<td>11</td>
<td>SEQUENCE STRATIGRAPHY: AN APPLIED WORKSHOP - SQS</td>
<td>Denver, US</td>
<td>30 Jul-3 Aug 2018</td>
</tr>
<tr>
<td>27</td>
<td>STRUCTURAL AND STRATIGRAPHIC INTERPRETATION OF DIPMETERS AND BOREHOLE-IMAGING LOGS - SGI</td>
<td>Denver, US</td>
<td>1-5 Oct 2018</td>
</tr>
</tbody>
</table>
**Applied Maintenance Management – OM21**

**BASIC 5-Day**

No matter what the price of oil is safe, efficient operations require well managed, integrated asset management. Effective, well organized maintenance management is the key to this course participants will receive a sound, integrated, basic knowledge of the maintenance function and how to progress towards world-class performance. Individual action plans will carry course learning into the work environment. A pre and post seminar self-assessment will be given to indicate delegates’ competency improvements. The assessment is taken from the PetroSkills industry standard competency map for Maintenance Management.

**DESIGNED FOR**

Maintenance supervisors, team leaders, or managers needing to improve their maintenance programs. This course is a broad survey of essential aspects of maintaining a safe, efficient, and reliable facility asset.

**YOU WILL LEARN**

- World class maintenance standards and how to apply them
- Key performance indicators for your dashboard
- Essential elements of work planning and scheduling
- Optimization of preventive and predictive maintenance
- To focus your resources on critical equipment
- How to work with contractors more effectively
- Development of organizational competence

**COURSE CONTENT**

- World class standards • Maintenance strategies
- Planning and scheduling • Optimizing preventive and predictive maintenance
- Identifying critical equipment • Developing organizational competence • Presenting your action plan

---

**Maintenance Planning and Work Control – OM41**

**FOUNDATION 5-Day**

No matter what the price of oil is, safe facilities operations require effective maintenance work control. ISO 55000 (PAS 55) is the asset management standard everyone is moving towards. This course is designed to build competency in Work Control as a primary skill set required to achieve these new standards. It will focus on the six phases of work management: work identification, planning, prioritization, scheduling, execution, and history capture. These essential skills are the key components of integrity management, safety, efficient resource utilization, and reliable operation. A pre and post self-assessment will be used to measure competency improvement. In order to improve facility asset management, each participant will develop an action plan to help their organizations in the long-term effort to become more efficient and safe.

**DESIGNED FOR**

Maintenance managers, superintendents, supervisors, team leaders, and planners engaged in work management, planning, and scheduling.

**YOU WILL LEARN**

- To develop world class planning and work control
- To employ business process analysis techniques in work control
- How to use a gap analysis on your work management system
- Step-by-step work control from identification through using work history
- Optimization of preventive and condition-monitoring activities
- Techniques: critical equipment analysis, critical spares control, and emergency response work

**COURSE CONTENT**

- Work identification • Planning prioritization
- Scheduling execution • History records
- Optimizing preventive maintenance • Predictive maintenance planning • Critical equipment focus • Emergency response

---

**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**

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

**YOU WILL LEARN**

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

**COURSE CONTENT**

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

---

**Seismic Positioning Data Management – SPDM**

**FOUNDATION 2-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

- Seismic navigation data principles • Basic geodesy • 2D data loading exercises • Data quality control and practical examples thereof • 2D data editing and exporting • 3D bin grid data definitions and exercises for importing, analyzing, editing, and exporting
- Applied geodesy: Introduction to EPSG database • Trace data Licencing • Acquisition • Storage • Import and quality assessment • Formats and conversions • Best practices
PetroSkills is proud to offer our technical resources as a tool for oil and gas professionals worldwide. These come in the form of Video Series, Webinars, Articles, and E-Books and range across the full spectrum of topics covered by our oil and gas training courses. If there is any way we can help you, please don’t hesitate to contact us at training@petroskills.com or 918.828.2500.

**COMPLIMENTARY TECHNICAL RESOURCES**

**MULTI-DISCIPLINE TRAINING**
- e-Book - Best Tips of the Month - Subsurface Topics

**GEOLOGY**
- Video Series - Basic Petroleum Geology - Four-part video series covers topics such as plate tectonics, depositional environments, carbonates, and more.
- Video Series - Mapping a Faulted Surface in 3D – Three-part video series covers topics from our Mapping Subsurface Structures course.

**GEOPHYSICS**
- Webinar - Hilbert Transfer Attributes-Unplugged
- Video Series - Seismic Interpretation – Three-part video series covers topics such as overview of seismic interpretation, interpretation techniques, recognition of direct carbon indicators, and more.

**HSE**
- Webinar - SHE Auditing: A Management Systems Approach

**PETROLEUM BUSINESS**
- Article - Budgeting Exploration Activities
- Article - Budgeting Production Activities
- Article - Resolving Decision Dilemmas

**PETROPHYSICS**
- Webinar - The ‘Sneaky’ Influence of Clay Minerals on Formation Evaluation

**PRODUCTION & COMPLETIONS ENGINEERING**
- Video Series - Completions and Workovers – Three-part video series covers topics such as well stimulation, unconventional wells, workover planning, and more.

**WELL CONSTRUCTION/DRILLING**
- Webinar - How to Build a Performance-Ready Drilling Engineer

Additional resources available on Gas Processing, LNG, Instrumentation, Mechanical, and Pipeline. Go to www.petroskills.com/technicalresources to choose one of these informative tools!
Introduction to Petroleum Business – IPB

**BASIC 3-Day**

Creation of shareholder value should be at the heart of every business decision. This course is designed for technical professionals in the petroleum industry who want to understand the nature of the petroleum business and how they will contribute to the financial success of your company. The course will introduce delegates to the structure of the petroleum business including supply and demand, how oil companies are organized and financed and what it takes to be financially successful. Success will be explored through an understanding of how we calculate long-term shareholder value both at the corporate and project level as well as the valuation of competitive advantage and incorporation of risk assessment in our models. Delegates will be introduced to the primary accounting financial statements and what they tell us about a company. Common accounting and economic terms and metrics will be reviewed. Participants should bring a PC with excel software to complete exercises.

**DESIGNED FOR**

Engineers, geologists, geophysicists, landmen, HR and other non-finance and accounting professionals who need an introduction to the business aspects of the petroleum industry including the interplay of finance and economic evaluation in the creation of long-term shareholder value.

**YOU WILL LEARN**

- How the petroleum business is structured and capital is raised
- What is shareholder value and how it is created
- The critical importance of seeking competitive advantage
- Economic and accounting terminology
- How to make an economic valuation of an investment and assess its competitive advantage
- How value creation impacts share price
- How shareholder value is measured
- What is risk and how it is assessed in economic evaluations

**COURSE CONTENT**

The importance of creating value for shareholders • History and characteristics of the oil and gas business • Introduction to Economic Evaluation including Net Present Value, Internal Rate of Return, and risk • Introduction to the key accounting financial statements and terms • The need for competitive advantage and how it is measured • How to develop spreadsheets to conduct economic evaluations

---

Basic Petroleum Economics – BEC3

**BASIC 3-Day**

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

**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
- How to use economic criteria to choose investments
- Models to weigh risk and uncertainty

**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 • Tips on economic factors in computer spreadsheet analysis

---

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. 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 effect finance, 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

---

Managing Non-Technical Risks – MNTR

**NEW**

Non-technical or societal risks have become the main source of business delays and budget overruns in the oil and gas industry. Non-technical risks typically are related to political, regulatory, health, safety, environmental, and social issues. Mitigation requires good external awareness and stakeholder engagement skills, but also the willingness of technical and commercial teams to work closely together with the non-technical disciplines to accommodate non-technical perspectives in project designs and plans. This course looks at both the internal and the external challenges that a company may face related to stakeholder engagement. On the external side, we look at current trends in western and non-western societies, we study key stakeholder groups, in particular those seen as ‘difficult to deal with,’ and then cover the practicalities of creating and maintaining effective relationships. However, a company will not be effective in its response to the external world if it is not well organized internally. Therefore, this course will also look at processes and tools to ensure internal alignment and cooperation with the aim to link external awareness and stakeholder engagement (where appropriate) to business decision making. A key methodology is the quantification of non-technical risks because it helps prioritize and focusing of resources and mitigating activities.

**DESIGNED FOR**

All oil and gas business professionals who are directly or indirectly involved in the management of non-technical risks. Specifically, managers with accountability for business delivery, that is, projects or operations; managers of technical and commercial teams that support projects or operations; and professionals in Health, Safety, Security & Social Responsibility; Government Relations; and Communications.

**YOU WILL LEARN**

- About important trends in the relationship between business and society
- To make the business case for active management of non-technical risks
- Essential concepts of stakeholder engagement, including dealing with activist stakeholders
- How to set the internal structure and collaboration model to respond effectively to the external world
- How to apply the tools to identify, assess, quantify, and mitigate non-technical risks
- How to integrate non-technical risks into business decision-making processes

**COURSE CONTENT**

Trends in western and non-western societies affecting oil and gas companies • The business impact of non-technical risks: the case for action • An overview of modern stakeholder engagement models • Methods to deal with NGO’s, activist investors, and communities • Insight in the power and limitations of multi-stakeholder initiatives • Leave with a blueprint for implementation in your own company and more...

---

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Course</th>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABU DHABI, UAE</strong></td>
<td>16-19 SEP 2018</td>
</tr>
<tr>
<td><strong>DENVER, US</strong></td>
<td>20-23 SEP 2018</td>
</tr>
<tr>
<td><strong>HOUSTON, US</strong></td>
<td>15-17 OCT 2018</td>
</tr>
<tr>
<td></td>
<td>11-13 FEB 2019</td>
</tr>
<tr>
<td></td>
<td>29-APR-1 MAY 2019</td>
</tr>
<tr>
<td><strong>KUALA LUMPUR, MYS</strong></td>
<td>22-24 JULY 2018</td>
</tr>
<tr>
<td><strong>SAN FRANCISCO, US</strong></td>
<td>12-14 NOV 2018</td>
</tr>
<tr>
<td></td>
<td>11-13 NOV 2018</td>
</tr>
</tbody>
</table>

**AUSTRALIA**

- **MELBOURNE, AUS**
  - 14-16 JUL 2018 | $3250+VAT |
  - 17-19 JUL 2018 | $3175+VAT |

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Course</th>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABU DHABI, UAE</strong></td>
<td>16-19 SEP 2018</td>
</tr>
<tr>
<td><strong>DENVER, US</strong></td>
<td>23-26 SEP 2018</td>
</tr>
<tr>
<td><strong>HOUSTON, US</strong></td>
<td>15-17 OCT 2018</td>
</tr>
<tr>
<td></td>
<td>11-13 FEB 2019</td>
</tr>
<tr>
<td></td>
<td>29-APR-1 MAY 2019</td>
</tr>
<tr>
<td><strong>KUALA LUMPUR, MYS</strong></td>
<td>22-24 JULY 2018</td>
</tr>
<tr>
<td><strong>LONDON, UK</strong></td>
<td>3-5 SEPTEMBER 2018</td>
</tr>
<tr>
<td><strong>SAN FRANCISCO, US</strong></td>
<td>12-14 NOV 2018</td>
</tr>
<tr>
<td></td>
<td>11-13 NOV 2018</td>
</tr>
</tbody>
</table>

**AUSTRALIA**

- **MELBOURNE, AUS**
  - 14-16 JUL 2018 | $3250+VAT |
  - 17-19 JUL 2018 | $3175+VAT |

Any course is available inhouse at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Economics of Worldwide Petroleum Production – EWP

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 in 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 basis, who have had some previous experience in this area. Due to similarity in content, PetroSkills recommends that participants take this course if they have some previous experience and are looking for a course that 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 decision alternatives using predictive techniques
• Evaluate how projects effect the corporation

COURSE CONTENT
• Pricing: natural gas, marker crude oil, OPEC, spot and futures markets, transportation
• Production rate: mathematical models
• Cash flow: revenue, capital and operating costs, spreadsheet exercises
• Economic evaluation: present value concepts, sensitivity and risk analysis, decision trees, royalty, sources of capital, incremental economics, sunk costs, inflation
• Budgeting: examples and exercises, long-range planning
• Cash versus versus-off decision: depreciation, depletion, and amortization
• How to read a 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

PETROLEUM RISK AND DECISION ANALYSIS – PRD

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 examples. 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 hands-on-calculator 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 problem type emphasized 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, decision tree correlations • Probability and Statistics: four fundamental rules including Bayes’ rule (the easy way), calculating probabilities and distributions with simulation; modeling and optimizing investment portfolios; valuing added control and flexibility, stopping rules; ways to model correlation • Decision Tree Analysis: value of information review, sensitivity analysis; solving with utility for risk aversion • Decision Policy: portfolio optimization to maximize economic value; efficient frontiers; multi-criteria decision models; risk policy as a utility function; calculating expected utility and certain equivalent; insurance and hedging; optimizing working interests • Implementation: eliciting a decision maker’s or organization’s preferences for trade-offs among objectives, time value, and risk attitude; decision analysis presentation agendas and formats; special topics from the instructor’s own research and experience

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>3-7 DEC 2018</td>
<td>$2480</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC 2018</td>
<td>$2480</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>2-6 DEC 2019</td>
<td>$4325</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>10-14 OCT 2018</td>
<td>$4880+VAT</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>7-11 OCT 2018</td>
<td>$5035+VAT</td>
</tr>
<tr>
<td>TULSA, US</td>
<td>10-14 SEP 2018</td>
<td>$4190</td>
</tr>
</tbody>
</table>

Advanced Decision Analysis with Portfolio and Project Modeling – ADA

5-Day

Specialized

Quality forecasts and evaluations depend upon well-designed project and portfolio models that are based upon clear decision policy, sound professional judgments, and a good decision process. In this course participants learn to build good models. We use the familiar Microsoft Excel spreadsheet as the platform for project and risk assessment models. Add-in software provides Monte Carlo and decision tree capabilities. The course emphasis is on the evaluation concepts and techniques, rather than particular software programs.

DESIGNED FOR
Evaluation engineers, analysts, managers, planners, and economists. This course is intended for professionals involved with developing project evaluation, portfolio, and other forecasting and assessment models. Prior background in decision analysis is expected. Before registering, please visit http://www.decisionapplications.com/ada-pre-read to review a course prerequisites list and to take a short self-assessment quiz. You may log in with ‘ada’ (no quotes) as the password.

YOU WILL LEARN HOW TO
• Frame, build, and evaluate decision models and extract key insights
• Apply the exponential utility function for risk policy
• Design investment portfolio optimization models that include constraints, requirements, and typical interrelationships between projects
• Use decision tree software for value of imperfect information analysis
• Use Monte Carlo simulation software with optimization
• Develop quality Excel models for projects and portfolios

COURSE CONTENT
Decision Modeling: application of OA process for modeling; influence diagrams; judgments and biases; sampling error bias; sensitivity analysis; documentation and good modeling practices; real options overview • Monte Carlo Simulation: multi-pay prospective risk (similar ideas); calculating probability and distributions with simulation; modeling and optimizing investment portfolios; valuing added control and flexibility, stopping rules; ways to model correlation • Decision Tree Analysis: value of information review, sensitivity analysis; solving with utility for risk aversion • Decision Policy: portfolio optimization to maximize economic value; efficient frontiers; multi-criteria decision models; risk policy as a utility function; calculating expected utility and certain equivalent; insurance and hedging; optimizing working interests • Implementation: eliciting a decision maker’s or organization’s preferences for trade-offs among objectives, time value, and risk attitude; decision analysis presentation agendas and formats; special topics from the instructor’s own research and experience

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC 2018</td>
<td>$4480</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>17-21 JANUARY 2019</td>
<td>$4480</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>9-13 DEC 2018</td>
<td>$4525</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>14-18 OCT 2018</td>
<td>$5325+VAT</td>
</tr>
</tbody>
</table>

Cost Management – CM

5-Day

Few problems threaten the petroleum businesses more than uncontrolled costs. Economic realities have made it necessary for most companies to operate with a “lean and mean” philosophy. As the value of our products fluctuates widely, the most vulnerable companies are those that are ineffective in understanding and managing their costs. The ability to properly manage costs is now paramount in a competitive business and even their ultimate survival. As the energy industry goes through its most monumental changes since the 1970s, the companies that can identify efficiencies and inefficiencies will be able to react to the challenges of the global market place, thus generating higher profits. This seminar is an introduction to Practical Cost Management techniques designed to help the participant better understand the underlying dynamics of cost using recent events and trends, using relevant exercises, timely case studies and role-playing techniques.

DESIGNED FOR
Operating managers, field personnel, project managers, technology managers, budget managers, or anyone wanting to manage costs more efficiently and effectively. A familiarity with finance is helpful but not required.

YOU WILL LEARN HOW TO
• Understand the different cost classifications and cost drivers
• Determine and monitor the behavior of costs
• Build your own activity dictionary
• Understand the principles of Activity Based Costing (ABC) and its development and implementation
• Analyze capital projects using the proper tools and techniques
• Manage and not mismanage costs
• Develop tools to use for managing costs

Evaluate cost for effectiveness

COURSE CONTENT
Defining costs, classifications and terminology for an E&P company • Determining cost objects, cost drivers and their behaviors • Analyzing different types of cost management systems • Using Activities Based Management (ABM) to monitor costs and processes Building and using an activity dictionary • Using value added costs versus non value-added costs for improvement • Distinguishing between cost effectiveness and cost efficiencies • Developing productivity measurements that work • Operating Cost Management using the budgets efficiently and effectively • Using GAP analysis in measuring productivity of costs • Support departments cost allocations Transfer pricing • Determining the break-even cost and volumes • Using variance analysis budget and operating performance • Optimizing the supply chain • Developing and analyzing capital investment projects Replace versus maintain • Life Cycle Costing • Using different scenarios to more effectively manage costs Performance • Measurement using capacity management techniques

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC 2018</td>
<td>$4240</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>11-15 NOV 2018</td>
<td>$5035+VAT</td>
</tr>
</tbody>
</table>

Any course is available inhouse at your location. Contact us today.
Petroleum Finance and Accounting Principles – PFA

FOUNDATION 5-Day
Making the most efficient use of your resources is critical to the success of any company. Finance and accounting comprise the universal business language and help you manage those resources effectively. Planning and decision making that occur in an informal financial context permit better application of resources and promote competitive advantage. The aim of this course is to improve delegates’ job performance by enhancing their understanding of current international practices in finance and accounting within the E&P industry. The latest issues are discussed.

DESIGNED FOR
Personnel new to the oil and gas accounting industry - accounting, finance, or economists, others desiring to understand or refresh their knowledge of basic petroleum accounting concepts, financial personnel needing to understand unique issues as they relate to the petroleum industry, and technical or asset team members looking for the basic concepts of accounting and finance. Participants are encouraged to bring their company’s financial reports. This course may qualify for up to 34 hours of CPE for US CPAs.

YOU WILL LEARN HOW TO
• Understand financial reporting requirements for oil and gas companies under U.S. GAAP
• Apply basic concepts and terminology for accounting and finance in oil and gas
• Create accounting statements, including a cash flow statement from data accumulation to audited financial statements
• Distinguish between the different financial statements and their roles
• Distinguish between financial, managerial, and contract (joint operations) accounting
• Recognize the different oil and gas accounting methods
• Determine the difference between profits and cash flow
• Apply capitalization rules and depreciation methods
• Recognize accounting treatments of joint ventures such as Production Sharing Agreements
• Evaluate capitalized assets using a ceiling-test
• Read and understand those confusing footnotes
• Prepare, read, and use the disclosures for oil and gas companies
• Recognize how accounting decisions can affect earnings, cash flows, and operational decisions
• Calculate, understand, and analyzes financial reports and basic oil and gas ratios

COURSE CONTENT
Getting started: financial terms and definitions, the language of business; accounting rules, standards, and policies • Constructing the basic financial statements • Classifying revenues, assets, liabilities, and equity • Comparing different accounting elements • Accounting for joint operations • Accounting and reporting

Fundamentals of International Oil and Gas Law – IOG

FOUNDATION 5-Day
International petroleum transactions occur within a complex legal environment that limits what petroleum companies, host governments and service companies can do, and interprets and enforces many of their promises. Petroleum professionals often lack the broad understanding of what makes up this legal environment and how it can have an impact on their work. This course is designed to give participants a basic understanding of the legal fundamentals that make their international transactions work, including the principles that apply to interpreting and enforcing their agreements, the procedures for resolving their disputes, addressing interpretational issues posed by common contract provisions, and avoiding liability under environmental and bribery laws. The course will teach participants to confidently identify potential legal problems, and address them before they become serious, and facilitate the smooth interaction between oil and gas professionals, host government representatives, and their lawyers.

DESIGNED FOR
Petroleum managers who deal with international oil and gas legal matters in the course of their business, and legal professionals with little formal, specialized training in oil and gas law, but expect to deal with international oil and gas law matters.

YOU WILL LEARN HOW TO
• Recognize differences between international legal systems and transactions
• Understand legal fundamentals behind international transactions

COURSE CONTENT
Law governing international petroleum transactions (including significant differences between various national legal systems, and the sources, principles, and limits of international law as applied to petroleum transactions) • Interpretation and enforcement of treaties and private contracts • Effects of international trade (and producing country) agreements such as the E.U. NAFTA, Mercosur, and OPEC • Dispute resolution approaches, including litigation and arbitration • Procedures under and enforcement of common arbitration provisions • Legal defenses available to foreign companies, states, and state-owned or connected entities, and recognition and enforcement of judgments and arbitration awards • Basic legal concepts of ownership of mineral rights (onshore, offshore, and deep sea bed) • Expropriation and condemnation issues • State-owned entities and privatization • Laws bearing on development rights • Legal interpretational issues of common contract provisions • Interpretational issues for service contracts • Transfer and protection of technology and confidential business information • Operating agreements and unitized operations • Environmental protection laws • Criminal and civil liability for oil spills • Intermediation and guaranty issues • Bribery laws • Marketing and transportation • Petroleum futures

Petroleum Finance and Accounting Principles – PFA

FOUNDATION 5-Day
International petroleum transactions occur within a complex legal environment that limits what petroleum companies, host governments and service companies can do, and interprets and enforces many of their promises. Petroleum professionals often lack the broad understanding of what makes up this legal environment and how it can have an impact on their work. This course is designed to give participants a basic understanding of the legal fundamentals that make their international transactions work, including the principles that apply to interpreting and enforcing their agreements, the procedures for resolving their disputes, addressing interpretational issues posed by common contract provisions, and avoiding liability under environmental and bribery laws. The course will teach participants to confidently identify potential legal problems, and address them before they become serious, and facilitate the smooth interaction between oil and gas professionals, host government representatives, and their lawyers.

DESIGNED FOR
Petroleum managers who deal with international oil and gas legal matters in the course of their business, and legal professionals with little formal, specialized training in oil and gas law, but expect to deal with international oil and gas law matters.

YOU WILL LEARN HOW TO
• Recognize differences between international legal systems and transactions
• Understand legal fundamentals behind international transactions

COURSE CONTENT
Law governing international petroleum transactions (including significant differences between various national legal systems, and the sources, principles, and limits of international law as applied to petroleum transactions) • Interpretation and enforcement of treaties and private contracts • Effects of international trade (and producing country) agreements such as the E.U. NAFTA, Mercosur, and OPEC • Dispute resolution approaches, including litigation and arbitration • Procedures under and enforcement of common arbitration provisions • Legal defenses available to foreign companies, states, and state-owned or connected entities, and recognition and enforcement of judgments and arbitration awards • Basic legal concepts of ownership of mineral rights (onshore, offshore, and deep sea bed) • Expropriation and condemnation issues • State-owned entities and privatization • Laws bearing on development rights • Legal interpretational issues of common contract provisions • Interpretational issues for service contracts • Transfer and protection of technology and confidential business information • Operating agreements and unitized operations • Environmental protection laws • Criminal and civil liability for oil spills • Intermediation and guaranty issues • Bribery laws • Marketing and transportation • Petroleum futures

International Petroleum Contracts – IPC

INTERMEDIATE 5-Day
You will learn the philosophy, evolution, and fundamentals of international petroleum contracts and have an opportunity to see how each of these actually works. You will take part in life-like negotiating sessions mastering many negotiating techniques, where a mistake is a learning experience not a disaster. As you prepare for each session, you use a computerized economic model to assess the values of contract terms. This enables improved planning of negotiating strategies to achieve the desired goals by parties on both sides of the negotiating table. The classes include participants from both national oil companies and foreign contractors, which adds further realism to the exercises. Host governments and outside contractors are on opposite sides of the negotiating table, but they are not adversaries. A win-win business arrangement should be the objective of both parties, as a signed contract makes them partners. A viable contract cannot be negotiated without an effective understanding of the underlying economics. Negotiating strategies will determine contractual terms; ultimately defining the economic benefits to be realized.

Concessions and production sharing agreements are two of the contract types to be evaluated. Each participant receives a disk copy of the spreadsheets used in the negotiation workshop and a manual, which explains the fundamental principles of E&P contracts, presents examples of economic analysis, and includes a model contract.

DESIGNED FOR
Exploration and production managers, national oil company managers, government representatives, and others in the oil industry who expect to be involved in negotiating, administering, reviewing, managing, directing, and overseeing international exploration and production contracts between host governments and outside contractors.

YOU WILL LEARN HOW TO
• Distinguish between different types of contracts
• Understand the economics terms of an E&P contract
• Determine the economic value of various contract terms
• Negotiate and assess the value of contractual terms

COURSE CONTENT
Types of international petroleum contracts • Important principles and terms in all contracts • Host governments and contractors: contract objectives • Specific features of different types of contracts; dividing the production • Outline of a typical contract for E&P • Contract operating issues • Funding petroleum development programs • How the contractor is paid • Contractor’s risk • Contract economics • Non-financial issues • Analysis of contract provisions • Model contract • Natural gas production under international contracts • Negotiations workshop • Ethics in international petroleum operations

Strategic Thinking: A Tool-Based Approach – STT

SPECIALIZED 3-Day
This course is a hands-on case-based course focused on enhancing strategic thinking capabilities of decision makers in the oil and gas industry including those responsible for building and sustaining successful strategic plans. Participants are presented with several strategic tools for analyzing different aspects of the petroleum business from both a macro and micro perspective. There is a major emphasis on understanding how the petroleum industry has developed over the last 150 years including both successful and unsuccessful strategies that were used. This provides a basis for evaluating game changers that are now transforming the industry and positioning our businesses to maximize shareholder value. Case studies during this course provide opportunities for individualized and team-based learning. Teaching approach follows an iterative process of interactive discussions, application of materials, discussion of results, and re-application of materials to new contexts.

DESIGNED FOR
Geologists, geophysicists, engineers, managers, and executives responsible for defining, assessing, and developing business alternatives and strategy in the petroleum industry.

YOU WILL LEARN HOW TO
• Summarize, present, and discuss strategic management topics and issues
• Determine the factors that influence organizations to change their level of strategic thinking
• Identify, understand, analyze, and evaluate the strategies of their own units/divisions and other businesses in light of current and potential game changes
• Describe, apply, draw, and defend conclusions from strategic analysis tools

COURSE CONTENT
Review of the history of strategic thinking • Assessment of the petroleum industry from a strategic perspective as a supplier of energy • Understanding of how the industry responded strategically to historical events and what are the game changers that are now framing its future • STEEPLE framework • Michael Porter’s value chain analysis • Competitive Advantage: defined theoretically and quantitatively • SWOT (strengths, weaknesses, opportunities, threats) analysis • Strategic thinking as a craft • Scenarios analysis and planning • Six sigma • Boston Consulting Group (BCG) growth share matrix • Personal application of strategic thinking

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFA</td>
<td>3-7 JUNE 2019 $4375</td>
</tr>
<tr>
<td></td>
<td>8-12 OCT 2018 $4990+VAT</td>
</tr>
<tr>
<td></td>
<td>4-8 NOV 2019 $5085+VAT</td>
</tr>
</tbody>
</table>

See website for dates and locations.

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>2018-19 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPC</td>
<td>29 OCT-2 NOV 2018 $4340</td>
</tr>
<tr>
<td></td>
<td>28 OCT-1 NOV 2019 $4425</td>
</tr>
<tr>
<td></td>
<td>2-6 DEC 2018 $4340</td>
</tr>
<tr>
<td></td>
<td>24-28 SEP 2019 $4990+VAT</td>
</tr>
<tr>
<td></td>
<td>11-15 MAR 2019 $5135+VAT</td>
</tr>
</tbody>
</table>

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
FOUNDATION 3-Day
This three-day course covers practical considerations essential to achieve major improvements in planning, buying, storing, and disposing of the vast array of materials and spare parts needed in the oil and gas industry. Evolving best practices by major oil and gas companies are explored under three inter-related modules - inventory management, warehousing, and investment recovery.

DESIGNED FOR
Professional and management personnel who have responsibility for materials, spare parts, and services needed to support any refinery, gas plant, onshore/offshore production, or other industry operations.

YOU WILL LEARN
• How to provide better customer service for long lead or critical materials and spare parts essential to the success of any well field operation, offshore platform, refinery, gas plant, or chemical processing facility
• How to establish the best methods of inventory analysis and create performance measures for min/max and order point systems
• How to use supplier stocking programs, combine inventory, and integrated supply agreements
• How inventory systems use forecasting techniques and what can be done to improve them
• How to improve warehouse efficiency, layout, and space utilization for better inventory management
• How to improve inventory record accuracy and physical control of materials to lower inventory levels and increase space utilization
• Best practices used to manage surplus or inactive assets and increase investment recovery dollars

COURSE CONTENT
Overview of the contracting process • Key issues in forming a contract in the oil and gas industry • Establishing risk management priorities throughout the contracting process • The legal environment and best use of legal counsel in contracting • Avoiding and managing contract disputes in a challenging industry • The tendering process and key documents in the tender package • Buyer and seller pricing objectives to consider when tendering • Tools used in tendering to address financial key risks
Types of contracts and examples of industry applications • Using economic price adjustment clauses in lump sum agreements • Bid evaluation and award considerations including price/cost analysis • Using a formal contract change control process

Effective Materials Management – SC42

FOUNDATION 3-Day
This three-day course covers practical considerations essential to achieve major improvements in planning, buying, storing, and disposing of the vast array of materials and spare parts needed in the oil and gas industry. Evolving best practices by major oil and gas companies are explored under three inter-related modules - inventory management, warehousing, and investment recovery.

DESIGNED FOR
Professional and management personnel who have responsibility for materials, spare parts, and services needed to support any refinery, gas plant, onshore/offshore production, or other industry operations.

YOU WILL LEARN
• How to provide better customer service for long lead or critical materials and spare parts essential to the success of any well field operation, offshore platform, refinery, gas plant, or chemical processing facility
• How to establish the best methods of inventory analysis and create performance measures for min/max and order point systems
• How to use supplier stocking programs, combine inventory, and integrated supply agreements
• How inventory systems use forecasting techniques and what can be done to improve them
• How to improve warehouse efficiency, layout, and space utilization for better inventory management
• How to improve inventory record accuracy and physical control of materials to lower inventory levels and increase space utilization
• Best practices used to manage surplus or inactive assets and increase investment recovery dollars

COURSE CONTENT
Setting comprehensive inventory goals and objectives • Understanding carrying costs and economic order quantity theory • Improving material identification and coding • Segmentation inventory for analysis • Using formal procedures for making the decision to stock • Determining safety stock levels and order points • Improving min/max systems and settings • Understanding and using material forecasts • Establishing a warehouse scorecard • Creating best practices in the physical control of materials • Measuring record accuracy and improving cycle counting systems • Increasing the use of warehouse technologies • Improving warehouse safety and security • Preventing and reducing surplus materials • Understanding investment recovery techniques • Using the disposition value chain for investment recovery

Inside Procurement in Oil and Gas – SC61

INTERMEDIATE 3-Day
This course will expand the industry understanding of supply chain professionals and increase their value-added in a global, fast changing environment. Participants will learn what each industry segment requires from procurement and be given insights to maximize value delivery and increase their contribution. The course includes an online, interactive forum with the instructor, and pre-read materials designed to familiarize course attendees with relevant issues. Attendees will leave better prepared to create and support procurement strategies that meet stakeholder needs, whether for projects or operations support.

DESIGNED FOR
Supply chain professionals with 2-7 year’s experience either inside or outside the oil and gas industry. This course is for and gone who needs a better understanding of procurement value creation in the oil and gas industry and includes buyers, procurement specialists, logistics specialists, business analysts, team leaders, project managers, commodity managers, materials managers, and new sourcing specialists or category managers.

YOU WILL LEARN
• How industry is structured, including host country and strategic relationships
• Business drivers and interface issues to be supported by procurement
• The role of industry economics in dictating procurement good practices in cost management
• Industry global compliance needs and how procurement can add value
• How the industry is modeled in the E&P (upstream), midstream, and downstream value chains
• The E&P Asset Management Cycle and Total Cost of Ownership concepts
• Characteristics of supply markets to oil and gas and the emphasis on market intelligence practices and managing supply risks
• What constitutes effective procurement/supply chain metrics for performance improvement
• Problem challenges unique to the industry

COURSE CONTENT
Industry overview for procurement including host country and strategic relationships • Key business drivers and interface issues between projects (CAPEX) and operations (OPEX) • Procurement’s role in oil and gas value chain management - upstream, midstream, and downstream • E&P asset management cycle and total cost of ownership • Economics of oil and gas that drive procurement value creation • Industry regulatory and contractor safety compliance issues • Industry market intelligence practices in procurement • Industry spend analysis characteristics and strategies • Creating industry category management (sector) strategies • Key procurement and supplier performance metrics • Trends in global sourcing and local content requirements • Oil and gas law and global contracting risks • Influence of e-Commerce and e-Procurement initiatives in oil and gas

Strategic Procurement and Supply Management in the Oil and Gas Industry – SC62

INTERMEDIATE 3-Day
The development and implementation of carefully crafted strategies for the procurement of all goods, equipment, materials, and services has become a critical issue for all those in the oil and gas industry wishing to reduce operating cost while improving quality and productivity. This program explores key concepts forming the basis of strategic supply management, and moves today’s supply management organization from its typical tactical focus to the strategic focus needed to successfully implement the processes and methods needed to reach world-class performance.

DESIGNED FOR
Managers and professionals in supply management, procurement, purchasing, contracts, materials, inventory control, projects, maintenance, operations, finance, as well as all other professionals interested in lowering total cost and increasing productivity and profit contributions from better supply management operations.

YOU WILL LEARN
• Stages to world class supply management
• Skill sets in supply management
• Organizing the spend profile
• Greater abilities in leading continuous improvement programs
• Ways in dealing with economic uncertainties
• Questions for internal surveys to enhance purchasing performance
• How to develop a “Purchasing Coding System”
• Steps in the development of a Composite Purchase Price Index
• How to get more time to work on strategic issues
• Negotiation planning and strategies
• To understand the elements of cost that make up a supplier’s price
• Categories in a purchased materials/services strategic plan outline

COURSE CONTENT
Stages to world class supply management • Change and becoming more strategic • Supply management skill sets • Defining supply management • Examples of job descriptions for supply management • Developing the spend profile • Creating time to be strategic • The ABC (Pareto) analysis and what to do with it • Material/services purchasing code development • Elements of cost that make up the price • Developing “should cost” • Producer price index • Requesting supplier’s cost and pricing data • Understanding and dealing with uncertainties, when, where, and how to use “Economic Price Adjustment” clauses • Internal surveys to improve purchasing performance • Total cost of ownership concepts • Cost containment methods • Cost reductions and cost avoidance • Savings reporting procedure • Developing purchased materials/services strategic plans • Developing the purchase price index for your organization • Negotiation skill sets • Steps in negotiation preparation • Positional negotiations • Final points before the negotiation
Supplier Relationship Management – SC63

INTERMEDIATE 2-Day
Continuous improvement in all aspects of the supply chain is necessary to remain competitive in today’s global economy. The traditional adversarial relationship and transactional focus of buyers and suppliers cannot meet this demand for continuous improvement in lead-time, quality, and overall supplier performance. As a result, significant changes are occurring in the philosophies and approaches that define the relationship between purchasers and sellers in world-class organizations. Simply put, Supplier Relationship Management (SRM) and collaboration provide an organizational focus on communicating with suppliers on the many steps of the Supply Management process. This focus reduces the lead-time and total cost of acquisition, transportation, administration, and possession of goods and services for the benefit of both the buyer and seller, and as a result, provides a competitive advantage and improved profits.

DESIGNED FOR
Managers and professionals involved in purchasing, projects, contracts, supply management, operations, maintenance, engineering, quality, and other activities that expose them to dealings with suppliers for goods, equipment, and services in the oil and gas industry.

YOU WILL LEARN
• The Supplier Relationship Management Maturity Model
• Importance of SRM in continuous improvement
• Critical steps in developing trust with suppliers
• Supplier segmentation models
• 8 Step Strategic Alliance Development
• The difference between SRM and collaboration
• Best practices in managing supplier relations
• Key elements in improving the supplier relationship
• Best practices in supplier qualification, measurement, and recognition
• The importance of reengineering in SRM
• Supplier risk management process

COURSE CONTENT
The organizational challenge • Defining the supply management mission and vision • Critical supply strategies • Defining Supplier Relationship Management (SRM) • The SRM Maturity Model • Major components of SRM • Defining levels of the organization’s SRM Maturity • Critical ABC analysis • Commodity and service coding • Segmentation of the supplier base • Defining the alliance • The alliance process • Success factors and barriers to alliances • Focusing on high value activities • Reengineering • Detailed mapping of processes • Developing the skills and defining the organization’s mission in building supplier relationship • Best practices for managing supplier relations • A survey for letting the supplier rate you • Maintaining good supplier performance • Who and what to measure • Monitoring supplier performance • Developing and maintaining a supplier performance index • Supplier recognition and expectations • Supply Risk and trends leading to greater risk • Typical

Cost/Price Analysis and Total Cost Concepts in Supply Management – SC64

INTERMEDIATE 3-Day
Managing and reducing cost continues to be one of the primary focal points of PSM in oil and gas today. In many organizations, more than half of the total revenue is spent on goods and services, everything from raw material to overnight mail. Maintaining a competitive position and even survival will depend on the organization’s ability to use all of the continuous improvement strategies that have been developed to reduce cost across the entire supply chain for the life of the product or service. Fundamental to developing and implementing these strategies is knowledge of cost/price analysis, value analysis, and total cost of ownership concepts. This course provides the concepts that are essential skill sets in developing and implementing the strategies required to achieve the high levels of cost reductions possible from the supply chain. SC64 is also available as a 5-day in-house course with expanded content.

DESIGNED FOR
Managers and professionals in purchasing, procurement, and contracts as well as those involved in operations, engineering, maintenance, quality, projects, and other company activities that expose them to suppliers and buying activities for production, maintenance, equipment, MRO, services, and other outside purchased requirements.

YOU WILL LEARN
• Importance of price/cost analysis in continuous improvement programs
• The difference between price and cost analysis
• Methods of price analysis
• How to manage volatile markets
• Use of Producer Price Indexes
• Methods of cost analysis
• Development of “Should Cost”
• Types of TCO models

COURSE CONTENT
Use of price indexes • Cost/pricing analysis • Total cost of ownership • RFQ/tendering as a price analysis tool • Cost estimating relationships • Purchasing savings impact on the bottom line • Developing the spend profile • Sources of spend data • How to perform the ABC analysis • Examples of using pivot tables in Excel for data mining • Continuous improvement skill sets • Difference between cost and price analysis • Selection tool • Methods of price analysis • Historical analysis • Developing company purchase price • Index matching • Cost analysis • Major elements of cost • Requesting supplier cost info • Sources of cost information • What and how important are supplier overheads • How much profit should the supplier make economic • Price adjustment clauses • Total costs of ownership models • How to combine price and performance to obtain TCO

Project Management in Upstream Field Development – FPM2

FOUNDATION 3-Day
A project does not stand alone. Not only does a project manager need to stay focused on project cost, schedule and performance targets, he or she must take a broader view. Many projects are a part of a larger field development program. Maintaining cadence among related projects is essential to success. This course will help you effectively deliver facility and infrastructure projects that are crucial for timely oil and gas production. Upon completion you will know how to use fit-for-purpose project management control tools for good project results; work the project management, drilling and completion, HSE, land, production, and transportation disciplines together for success; and control interfaces among different projects and contractors. This course addresses key requirements for repetitive projects in oil and gas programs. These projects include well flow lines, tank batteries, booster compressors, short pipelines, and meter stations that are a part of a larger field development program. Emphasis is on both conventional and unconventional resources, such as shale oil and coal bed methane. The course is taught using a blend of instruction, guided discussion, and hands-on exercises based on the instructor’s petroleum successes and failures. The exercises will include both individual and group activities.

DESIGNED FOR
Early career project managers, leads, engineers, and services personnel who are on field development project teams. This includes operations and facility reps, cost and schedule controllers, and buyers and logistics specialists. This course is also for the business, finance and land reps as well as other non-engineers who would benefit from an overview of oil and gas project and programs.

YOU WILL LEARN HOW TO
• Define the project work to be done
• Develop scopes of work, cost estimates, and schedules
• Prepare project execution plans
• Plan actions to overcome progress constraints
• Track and control progress

COURSE CONTENT
Field development programs • The project delivery system • Organizing resources • Engineering • Construction • Execution planning • HSE and project risk • Procurement and contracting • Cost estimating • Planning and scheduling • Progress and change

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.

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 (FPM2) and Project Management for Upstream Field Development (FPM2) courses.

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

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

2018-19 Schedule and Tuition (USD)

HOUSTON, US
5-9 NOV 2018 $4340
4-8 NOV 2019 $4425
2-6 SEPT 2019 $5135+VAT
LONDON, UK
3-7 SEP 2018 $4990+VAT
4-8 NOV 2019 $4425
2019 Schedule and Tuition (USD)

HOUSTON, US
3-5 DEC 2018 $3165
4-6 NOV 2019 $3245

*plus computer charge

Any course is available inhouse at your location. Contact us today.
+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Project Management for Engineering and Construction – FPM22

INTERMEDIATE 5-Day

Many petroleum projects fail to meet their authorized cost, schedule or operability targets. To be successful, today’s project leader needs a comprehensive set of technical, business and interpersonal skills. This course addresses those critical skills. Seasoned instructors tackle the issues and challenges found in concept selection, development planning, facility design, procurement, and construction activities. The specific teams are received in this schedule and cost management, risk mitigation, and the proper use of scarce resources (people and materials) will help you make better decisions. Upon completion you will know how to improve engineering and service discipline work relations, use execution plans to integrate the work, and effectively employ cost and schedule control tools.

This course is taught using a combination of instruction, facilitated discussion, and indepth exercises based on the instructor’s petroleum development successes and failures. The exercises will include both individual and group activities that provide you with a practical application of the principles and practices necessary to keep your project on track.

DEIGNED FOR

Project managers, facility engineers, engineering representatives, schedulers, cost controllers, operations personnel, and supply chain specialists including team leaders and others who participate on or consult with multi-discipline development teams. This course is also suitable for business development, finance and land specialists as well as other non-engineering personnel who would benefit from an understanding of oil and gas project management.

YOU WILL LEARN HOW TO

• Define development stages and skillfully execute them
• Develop scopes of work and execution plans
• Utilize project control techniques and earned value analysis
• Develop engineering design checklists to ensure key deliverables for each phase are addressed
• Guide teams through technical reviews and secure needed approvals
• Measure progress during construction

COURSE CONTENT

Project development systems for the oil and gas industry • The stage-gate system • Key knowledge areas for leaders • Leadership • Design engineering • Contracting • Execution planning for design, procurement, and construction • HSE management • Risk identification and mitigation • Organization types and resource deployment • Work breakdown structure • Planning and scheduling • Progress measurement • Cost estimating • Change control • Reviews and approvals

Managing Brownfield Projects – FPM42

INTERMEDIATE 5-Day

Why is it so difficult to manage projects inside operating facilities? Keeping the scope from growing is a constant battle. Operations priorities and maintenance needs hamper work progress. This is especially so as successfully completed projects need strong control, effective liaison, and good interface management. They must be managed differently than greenfield projects. Experienced instructors will share tools and techniques that will help you work in this dynamic, operations-centric project environment. Upon completion you will know how to examine existing documentation and confirm field conditions to improve scope control; frame a project and select the best concept for development; and coordinate the work effectively with operations, maintenance and shipping. Instruction, guided discussion, and in-depth work tasks based on the instructor’s brownfield project management experience are used. Offshore and onshore examples are used. The sharing of experience in this course make the sessions challenging and insightful.

DEIGNED FOR

This course is for team members that work projects installed in existing facilities. Engineering projects that must be successfully completed to maintain and maximize production. This course helps business, commercial and finance and other non-engineers who want a greater awareness of brownfield project challenges.

YOU WILL LEARN HOW TO

• Deal with competing priorities • Stage development to manage plant complexity • Minimize surprise work due to diligence surveys • Resolve issues using an oversight board • Tailor contracting strategy for brownfield projects • Tackle unique brownfield constructability issues • Ensure operations staff buy into objectives

COURSE CONTENT

Brownfield stage gate system • Staffing the team • Communications needs in an operating facility • Challenges in concept choice • Key value improving practices • Due diligence in the existing facility • Quality in engineering, procurement, and construction • Increased brownfield risks • Change management • Contract strategy • Procurement, logistics, and material management • Construction management and HSE • Managing cost/ schedule expectations • Performance reporting • Commissioning and startup • Roles and qualities of successful project managers

Managing Project Controls for Contractors and Owners - PC21

INTERMEDIATE 3-Day

This course addresses project controls principles and practices as they relate to fabrication as well as engineering, procurement, and construction contractors. The focus of the course is using project controls effectively to work with the client, maintain project profitability, make schedule, and deliver a quality and safe project. Upon completion of this course, the participant will understand the critical success factors for cost estimating, scheduling, and progress measurement and be able to utilize these best practices to resolve issues and challenges experienced by EPC contractors on their projects. Participants will understand all the steps necessary to develop an effective EPC project controls plan and staff it to increase the likelihood of success. The course focuses on completing contract requirements during the detailed engineering, procurement and construction phases of project development. How to use project controls for effective decision making and client management is also addressed. The course is taught using a combination of 30% instruction and 70% facilitated workshop sessions that address real-world issues and challenges. The workshop sessions include both individual and group activities that will provide each participant with a hands-on application of the principles and practices discussed throughout the course.

DEIGNED FOR

This course addresses the special requirements associated with project controls for EPC contractor or fabricator professionals. It is intended for EPC project managers, project engineers, project team members, project controls professionals, planner/schedulers, and project discipline team leads.

YOU WILL LEARN HOW TO

• Understand the critical role that project controls plays in developing a well-planned and executable EPC proposal for both cost and schedule • Set progress measurement metrics so that the client, contractor management and team members understand the potential to meet project cost and schedule • Support a successful outcome from Front End Engineering Design through execution with necessary project controls activities (cost, schedule, and earned value management) • Develop a robust EPC Project Controls Plan and associated staff with roles and responsibilities to support the plan • Manage project changes when requested by the client • Forecast the final project cost and the final project completion date using progress measurement or earned value • Use Monte Carlo simulation to reveal problems with a proposal’s cost and schedule

COURSE CONTENT

In the context of Project Controls, a case study will address • Supporting project execution • Cost estimating • How to realize when you have under-bid the project • How to schedule when owner is causing delays • Unrealistic schedule • Handling conflicts • and more...

Risk Management for Upstream Capital Projects - PMRM

INTERMEDIATE 5-Day

This five-day, intermediate level course for project managers, project engineers, and integrated project team discipline members addresses the key areas associated with capital project risk management. The course focuses on managing risk throughout the entire project life cycle. This course is very much hands-on with class exercise case studies that focus on participant development of risk management deliverables. The class also addresses the tools that project team leaders can utilize to ensure that project team members and management buy in and are part of the risk management process.

DEIGNED FOR

Project managers, project engineers, and all disciplines that work on integrated project teams for upstream onshore and offshore developments. Case studies include deep-water projects with complex production components, as well as unconventional shale projects that require significant infrastructure investment.

YOU WILL LEARN HOW TO

• Apply risk management to a capital project throughout the entire life cycle • Write a risk management plan and gain alignment with key stakeholders • Engage management and project team members in the risk management process • Systematically identify risks for your project • Determine those risks that are owned by the project team and those owned by management • Use risk assessment to analyze and prioritize risks for treatment • Develop robust risk mitigation plans • Control and monitor risk • Incorporate risk planning into project cost and schedule • Use the role of probabilistic cost and schedule in risk management

COURSE CONTENT

Risk management planning • Roles/ responsibilities, governance, and risk ownership • Identify, analyze, and respond to risk events • Types of risks: threats vs. opportunities • Risk analysis and prioritization • Risk mitigation and contingency planning • Monitor and control risk • Risk reporting and communication • High level overview of probabilistic cost and schedule peer reviews

---

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>22-26 JUL 2019</td>
<td>$4340+GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>6-12 OCT 2018</td>
<td>$4340</td>
</tr>
<tr>
<td></td>
<td>20-24 MAY 2019</td>
<td>$4425</td>
</tr>
<tr>
<td></td>
<td>14-18 OCT 2019</td>
<td>$4425</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>8-12 JUL 2019</td>
<td>$4425+GST</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>8-9 NOV 2018</td>
<td>$4900+VAT</td>
</tr>
<tr>
<td></td>
<td>8-9 NOV 2018</td>
<td>$5135+VAT</td>
</tr>
<tr>
<td>PERTH, AUS</td>
<td>17-21 JUN 2019</td>
<td>$5340+GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>5-7 AUG 2019</td>
<td>$3305</td>
</tr>
</tbody>
</table>

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)  
Any course is available inhouse at your location. Contact us today.
Advanced Project Management – FPM62

SPECIALIZED 5-Day

Mega projects are complex. A program composed of these super projects is highly complex. For a very large project, addressing linked issues is key to improving the chances of success. In a large project, these key issues interact producing unexpected results. Instructors will explore critical issues in contracting, decision making, and facility design. Interface control and risk reduction are examined. Non-technical problems in stakeholder relations, partner ventures, and approvals, are also tackled. Upon completion you will know how to deal with the program complexity and surprise effects; improve program strategies and deliver the projects on time; address both project and program resource concerns. Instruction, guided discussion, and in-depth work tasks based on the instructor’s petroleum experience are used. The workshop will include both single and group activities.

DESIGNED FOR

Experienced project and program personnel. Directors, managers, and team members in engineering, procurement and construction will benefit from attending. Project services personnel in the cost, schedule, contracts, procurement and quality functions are encouraged to attend. This specially designed course is suitable for business, commercial, and finance and other non-engineers who want a greater awareness of mega project challenges.

YOU WILL LEARN HOW TO

• Improve complex decision making
• Develop contracts for prompt work completion
• Evaluate risks in technology and design
• Develop contracts for prompt work completion

COURSE CONTENT

Key aspects of a stage-gate process • Effects of markets on contracting • How governance affects decision making • How limited resources affect technology and design • Advanced methods for influencing stakeholders • Challenges with partners • Critical factors in interface control • Risk methods that preserve mega project value • Managing peer reviews, assists, and approvals

Advanced Project Management II – FPM63

SPECIALIZED 5-Day

This five-day advanced level course for experienced project management professionals addresses the fundamental principles and techniques of project management and how to apply them on large international projects. This course will cover all the project phases, with hands-on content directly supported by practical case studies.

DESIGNED FOR

Experienced project managers, project engineers, project controls managers, and construction managers who are working on large international projects or about to start new assignments on international projects. Practical case studies will cover the entire spectrum of a large international project and will include offshore and onshore capital investment.

YOU WILL LEARN

• Why international projects fail and the early warning signs to look for
• The principles of project management that ensure project success
• How to build a strong and effective Project Management Team (PMT)
• How to identify and manage project stakeholders
• How to conduct business and yourself in the international arena
• How to select an effective contracting strategy and the appropriate negotiation style
• The practical approach for global engineering, procurement, logistics, fabrication, construction, and commissioning
• How to conduct project risk management throughout the entire project lifecycle
• How to apply effective leadership and strategy on your international project

COURSE CONTENT

Why projects fail • Project Management principles (PMT, scope, cost, schedule, safety, and quality) • Stakeholders management on international projects • Host country - business and culture contracting • Strategies and negotiations • Global engineering - from concept through detailed design procurement and logistics • Fabrication, construction and commissioning • International project risk management • Leadership and strategy

Advanced Project Management Workshop – APMW

SPECIALIZED 3-Day

NEW

This course will not follow the traditional lecture-style format, instead it will be an interactive hands-on workshop where the participants will work on several case studies directly related to the selected topics. This workshop will take an EPC contractor perspective while also highlighting how Owner companies (IOCs & NOCs) interact with their EPC contractors to develop and execute their projects. The workshop material covers both onshore and offshore projects. The main objective of this workshop is to present several real-life scenarios of different types of project issues encountered by contractors and work through these issues to show how they should be addressed to arrive at an optimum resolution. This workshop will focus more on practice and less on theory. In addition to the case studies created and provided by PetroSkills, it is recommended that attendees provide a few scenarios from their current or past projects to be used in the workshop as case studies.

DESIGNED FOR

Experienced project managers, project engineers, project controls managers, construction managers and discipline leads.

YOU WILL LEARN HOW TO

• Allocate contract risk between owner and contractor
• Address terms and conditions at bidding stage
• Hand owner-provided FEED as basis of bid
• Finalize terms and conditions before contract signing, contract administration, and records keeping
• Understand and negotiate liquidated damages applied to project milestones
• Handle change orders, suspension of work by owner or contractor, and contract termination for cause or convenience
• Prepare for dispute resolution and claim by contractor
• Determine when negotiation, mediation, arbitration, and litigation are necessary
• Identify governing laws in the contract
• Determine cost of claims and who is responsible for payment
• Protect yourself from claims by owner against contractor
• Prevent claims where possible
• Identify project risks and determine their impact during engineering, procurement and construction phases
• Apply risk management on a project at the right time
• and much more...

COURSE CONTENT

Why projects fail • EPC contracts • Dispute resolution and claims • EPC risk management • Scope changes • Cost and schedule management • Project planning and execution • Working with owner (client) and their PMC

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 to improve your effectiveness. This seminar/workshop will include self-assessment, discussion, lecture, readings, role-playing, games, video examples, and creation of participant action plans. This course will help you unleash natural motivation in your team. Your stress level can be lowered by working more efficiently and effectively by tapping the emotional intelligence of your team and co-workers.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Become a more effective leader by overcoming the “tyranny of the urgent” with better time management
• Make better decisions by assessing what 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 • Team building • Critical thinking and taking action

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Course Code</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>1-5 APR 2019</td>
<td>FPM62</td>
<td>$4470+GST</td>
</tr>
<tr>
<td>DUBAI, UAE</td>
<td>17-19 JUNE 2019</td>
<td>APMW</td>
<td>$3325+GST</td>
</tr>
<tr>
<td></td>
<td>25-27 AUG 2019</td>
<td></td>
<td>$4205+VAT</td>
</tr>
</tbody>
</table>

See website for dates and locations.

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Course Code</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY, CANADA</td>
<td>16-20 SEP 2019</td>
<td>OM23</td>
<td>$4220</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>22-26 APR 2019</td>
<td></td>
<td>$4225</td>
</tr>
<tr>
<td>ORLANDO, US</td>
<td>5-7 DEC 2018</td>
<td></td>
<td>$4190</td>
</tr>
<tr>
<td></td>
<td>2-6 DEC 2019</td>
<td></td>
<td>$4270</td>
</tr>
</tbody>
</table>

+1.918.828.2500  | petroskills.com  | +1.800.821.5933 (toll free North America)
Essential Technical Writing Skills – ETWS

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

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

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

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

Negotiation Skills for the Petroleum Industry – NSPI

BASIC 3-Day
This course helps you to develop strong interpersonal skills in the art and science of negotiation. You will learn to apply these skills to complex organizational issues and individual needs. The course includes a Negotiating Style Profile self-assessment to determine your preferred negotiation style(s). Various tools and techniques are used to negotiate differences and disagreements to produce positive results. A group workshop on conducting a collaborative negotiation, allows attendees to engage in, comment on, and improve their competencies in negotiation skills.

DEIGNED FOR
Petroleum industry personnel who are responsible for negotiating the best possible terms of an agreement in public and private sectors and those negotiating resources and deliverables in projects and programs.

YOU WILL LEARN HOW TO
• Follow a step-by-step method to the structure, techniques, and approaches available to positively influence an effective negotiation
• Adapt negotiation at each stage of the negotiation
• Leverage the power of Best Alternative To A Negotiated Agreement (BATNA), Worst Alternative To A Negotiated Agreement (WATNA), Zone of Possible Agreement (ZOPA), and Walk-Away Price (WAP)
• Modify your communication style to achieve desired results
• Respond to tough negotiators
• Select a strategy for your negotiation
• Use the Agree, Bargain, Control or Delay (ABCD) method
• Practice your negotiation skills in real world practice sessions
• Apply what you’ve learned to plan a negotiation back on the job using the Strengths, Weaknesses, Opportunities, and Threats (SWOT) model

COURSE CONTENT
Learn a step-by-step method to the structure, techniques, and approaches available to positively influence an effective negotiation • Know what behavior to adapt at each stage of the negotiation • Leverage the power of Best Alternative To A Negotiated Agreement (BATNA), Worst Alternative To A Negotiated Agreement (WATNA), and Walk Away Price (WAP) • Adjust your communication style to achieve desired results • Deal with tough negotiators • Craft a strategy for your negotiation • Use the Agree, Bargain, Control or Delay (ABCD) method • Practice your negotiation skills in real world activities • Apply what you’ve learned to plan a negotiation back on the job

Team Building for Intact Teams – TB

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

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

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

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

Team Leadership – TLS

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

DEIGNED 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 group operational norms • Working through the stages of team development • Effective team roles and relationships • Dealing with system influences • Conditions for effective team building • Individual and team assessments • Team communications • Group dynamics • Problem solving in teams • Developing personal plans to improve team effectiveness • Taking the lead • Effective team meetings • Monitoring team progress

2018-19 Schedule and Tuition (USD)

HOUSTON, US 9-10 MAY 2019 $2395
LONDON, UK 8-9 NOV 2018 $2915+VAT

Any course is available inhouse at your location. Contact us today.
Any course is available inhouse at your location. Contact us today.  
+1.918.828.2500   |   petroskills.com   |   +1.800.821.5933 (toll free North America)

Presentation Skills for the Petroleum Industry  
– PSPI

FOUNDATION  3-Day

One of the prime requisites for oil and gas professionals is to be able to deliver presentations in as clear, concise, and well-designed a way as possible. Some industry technical professionals are naturally gifted designers/speakers/presenters, others are not. However, with the proper training and practice, anyone and any professional can learn to make a convincing and persuasive presentation, and do so in a confident, assured, comfortable, and relaxed manner. This course is for individuals who are required, as part of their job, to deliver presentations in-house or in public, and who wish to perfect the art and craft of dynamic presentation-making in order to do so. Participants will participate in a full array of hands-on-class exercises to improve presentation-making skills, vocal techniques, social interaction skills, visual aid preparation, etc. Attendees will deliver two presentations in class, both of which will be videotaped to measure improvement, and will discuss their performances in one-on-one private conversations with the instructor at the end of the course. Participants’ progress will also be charted to quantitatively show areas in which actual improvement has taken place.

DESIGNED FOR  
Industry personnel who wish to acquire the skills and techniques needed to design and deliver technical material clearly, confidently, and convincingly either face-to-face or online.

YOU WILL LEARN HOW TO  
• Design and deliver a presentation both in person and on-line  
• Keep an audience engaged through use of various delivery methods  
• Appropriately use technology and visual aids  
• Speak confidently in front of groups

COURSE CONTENT  
Communication and the role it plays in presentation-making  
• Overcoming fears: The similarities and differences between face-to-face and on-line presentations  
The four fundamental basics to effective presentation-making  
Presence/demeanor/appearance: posture, movement, and physical comfort  
Delivery: the voice, gestures/facial expressions, skill in using silence, rhythm, and language  
Production: flow/rhythm, skill in using visual aids/technology, skill in using time, skill in listening/observing/questioning, skill in using the venue, connectivity, eye contact, knowledge of audience, and skill in handling audience/situation  
Construction and organization: design (presentation), design (PowerPoint slides/other visuals), and integration (presentation with visuals)

Making Change Happen: People and Process  
– MCPP

INTERMEDIATE  2-Day

Attendees will work in teams to overcome the problems encountered when making changes in their organizations. You will also learn how to develop the ability to effectively handle organizational changes by examining the eight-step change process and understanding your own, and others, needs and responses to each step in the change process. A group workshop allows attendees to engage in, comment on, and improve their competencies in managing change.

DESIGNED FOR  
All managers, team leaders, supervisors, and individuals responsible for ensuring change is implemented successfully.

YOU WILL LEARN HOW TO  
• Profile individual and group behavior exhibited during change  
• Improve individual and team dynamics for high performance  
• Apply the GROW model to coach and sustain individuals undergoing organizational change  
• Design a practical framework for positive engagement with organizational change

COURSE CONTENT  
Explore the characteristics of change  
• Build an integrated change strategy  
• Embrace change positively using the power of vision  
• Use people and process to make change happen  
• Craft an effective measurement process to evaluate change  
• Facilitate change and overcome resistance through effective communication

Meeting Management and Facilitation for the Petroleum Industry  
– MMF

FOUNDATION  2-Day

Meetings remain a boon or curse to corporate communication. Properly planned and managed, meetings are extremely positive and dynamic ways to exchange ideas, shape policy, resolve problems, effect change, etc. However, when poorly designed and implemented, meetings accomplish little. They become virtual breeding grounds for confusion, tension, frustration, boredom, and negativity. This course is for petroleum industry professionals who plan and conduct meetings. During this interactive 2-day session, participants will learn how to perfect meeting facilitation skills; master meeting agenda design skills; and polish meeting communication skills so that they’ll be able to run meetings effectively, efficiently, and smoothly. Participants will be given ample opportunity to practice what they’re learning in class and to receive feedback about those areas of meeting management and facilitation they do well and those areas that they’ll need to improve.

DESIGNED FOR  
Petroleum industry professionals who plan, conduct, and manage meetings.

YOU WILL LEARN HOW TO  
• Run efficient face-to-face and/or on-line meetings  
• Prepare and implement meeting agendas  
• Incorporate meeting facilitation techniques and tools  
• Understand meeting roles and responsibilities  
• Use meeting facilitation tools  
• Master meeting management skills; i.e., using time wisely, avoiding topic confusion, handling personal attack, avoiding ‘traffic’ problems, dealing with individual and group communication, and maintaining topic (agenda) focus  
• Recognize and understand the various roles that a facilitator plays during the course of a meeting  
• Speak in front of others

COURSE CONTENT  
Speaking skills  
• Time management in meetings  
• Agenda creation  
• Conflict management  
• Meeting facilitation aids

Managing and Leading Others  
– MLO

FOUNDATION  3-Day

Why would any company expend hundreds of thousands of dollars to seek, recruit, and hire the best employees then leave their development and performance to lucky chance through ineffective leadership and management practices? Unfortunately, that chance occurs every time an employee is promoted to a leadership, supervisory or management position without training in the techniques and practices of effective leadership and management. Managers and supervisors, regardless of technical expertise, can make an error setting off an uncontrolled and disastrous chain reaction unless he/she has command of principles and practices leading to employee effectiveness, productivity, and teamwork. The first-line and mid-level supervisor has more direct effect on employees and the productivity of a work group than any other single entity in the organization. This course increases the confidence and productivity of leaders, supervisors and managers who may be scientific or technical specialists, but have minimal training in the science and art of leading others. Skills in human relations, communication, motivation, and leadership are essential tools for the supervisor and manager. This course provides techniques enabling leaders to efficiently use one of the greatest resources a company has, its people. This interactive learning program will assist you in expanding your options for leading others.

DESIGNED FOR  
Anyone responsible for leading others in the daily performance of a work, including soon to be leaders, front-line leaders, new and experienced supervisors and managers, team leaders, coaches, and mentors.

YOU WILL LEARN HOW TO  
• Apply concepts of leadership and management to real work situations  
• Coach and supervise a diverse and dispersed workforce  
• Set appropriate goals and manage performance and change to ensure these goals are reached  
• Empower your workforce to exceed expectations  
• Develop effective communication skills

COURSE CONTENT  
The role and function of the leader, supervisor, and manager  
• Understanding and applying essential behavioral management concepts  
• Understanding and increasing employee motivation  
• Understanding and applying leadership concepts  
• Effectively supervising a diverse workforce  
• Basic skills in interpersonal communications  
• Performance management  
• Coaching  
• Working with difficult employees  
• Goal setting  
• Empowering subordinates  
• Creating positive and functional thinking about work  
• Making ongoing change for growth and improvement  
• Taking personal responsibility  
• Developing personal plans to improve team effectiveness

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATES</th>
<th>FEES</th>
</tr>
</thead>
</table>

See website for dates and locations.

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATES</th>
<th>FEES</th>
</tr>
</thead>
</table>

2018-19 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATES</th>
<th>FEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>6-8 MAY 2019</td>
<td>$3245</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>5-7 NOV 2018</td>
<td>$3055 + VAT</td>
</tr>
</tbody>
</table>
MR. PETER AIRD has 38 years experience as an offshore drilling, well engineering, and operations specialist. He began his offshore engineering career working for Maersk and was a mentor for many offshore engineers world-wide. His skills then transferred to the oil and gas industry. He re-trained from 1980-1987 as a drilling supervisor, then worked in staff-based positions with Shell International and BP until 1993. Further skills, knowledge, and experience were gained in various global consultancy positions from 1993-2015. Peter worked in frontier Exploration-Appraisal and Development subsea, deepwater, HPHT, and horizontal drilling projects. He often worked with complex wells. Project-based work experience was gained in the early 1990s with offshore UK deepwater and HPHT wells, and frontier exploration wells in North America, South East Asia (Brunei, Malaysia, Vietnam) and Africa. Peter has extensive experience in the Gulf of Mexico, West of Britain, Norway, Faroes, Greenland, the Black Sea, South Atlantic, Europe Mediterranean, Red Sea, and West Africa. During the last several years, Peter has been further employed as a staff-based senior and specialist drilling engineer-leader, working with partners. He has worked with Maersk Oil, Maersk-Marathon Oil, Cairn Energy (UK), ONGC (India), Centrica (Norway), and Providence Resources (Ireland). His drilling specialty was further refined on a variety of subsea, horizontal, platform-in-HPHT, HPHT, deep and ultra-deep water drilling projects. Peter is a member of the Society of Petroleum Engineers from 1991, the Energy Institute, and the Chartered Engineers. Peter is a regular consultant and a registered Engineer with the UK Engineering Council from 2004. He actively participates in several industry forums and has shared his knowledge and experience through delivering deep water and other complex well design, drilling engineering, and operations training courses. He has produced multiple technical and operational treatises on oil well design, construction, engineering, and drilling operations. From 1993 he has also hosted a specialist interactive website at www.kingdomdrilling.co.uk. Peter holds an MSC in Drilling Engineering from the Robert Gordon University which he gained as a mature student. BSc.

MR. JEFFREY (JEF) ALDRICH is a Vice President and Senior Geoscientist with MHA Petroleum Consultants Inc., a Denver-based petroleum consulting firm. He has over 30 years of global oil and gas experience working from frontier exploration through appraisal and large development projects. His expertise is in unconventional reservoirs, prospect evaluation, reservoir simulation, workflow integration and multi-disciplinary and multi-scale geology. He has worked in dynamic, technical, work-over, Marine, Deepwater, Asia, Malaysia, Kalimantan, China, West of Britain, Norway, Faroes, Greenland, the Black Sea, South Atlantic, Europe Mediterranean, Red Sea, and West Africa. Jeffrey has over 30 years of experience in working with partners and advising on the potential for fields in North America, South East Asia (Brunei, Malaysia, Vietnam) and Africa. Jeffrey has extensive experience in the Gulf of Mexico, West of Britain, Norway, Faroes, Greenland, the Black Sea, South Atlantic, Europe Mediterranean, Red Sea, and West Africa. Jeffrey has been an active member in the AAPG, SPE, MAPG, DML, DIPS and is a Certified Petroleum Geologist (C3P3). He is an author or co-author of over 25 papers and/or technical presentations. BSc, MSc.

DR. ROSALIND ARCHER is Professor of the Mighty River Power Chair in Geothermal Resources at the University of Canterbury in Christchurch, New Zealand. Rosalind is a registered Professional Engineer in Geology and a registered Professional Geophysicist. She has a BSc in Geology from Washington State University, a PhD in Geophysics from the University of Chicago, and a DSc in Geology from the University of British Columbia. Rosalind is also a registered Professional Geophysicist in New Zealand. Rosalind is a world leader in the use of geophysical methods to study natural resources, and has worked on projects in the UK, New Zealand, and in many other countries. Rosalind has been an active member in the AAPG, EAGE, SEG, and other geophysical societies. She has served on the editorial boards of Geophysics, Geophysical Prospecting, and the Journal of Geophysical Research. Rosalind is a member of the New Zealand Academy of Sciences and a Fellow of the Royal Society of New Zealand. Rosalind has published over 100 scientific papers and has given numerous invited talks at international conferences. Rosalind has also written several book chapters and edited books on geophysical topics. Rosalind is a highly regarded geophysicist and has made significant contributions to the field of geophysical research. She has been honored with several awards for her contributions to the field, including the New Zealand Prime Minister's Science Prize, the AGU Ewing-Mitchell Medal, and the AAPG Outstanding Achievement Award. Rosalind is a highly respected member of the geophysical community and has made significant contributions to our understanding of the Earth's interior.
transactions and contracts. He has held purchasing and contracts management positions in high volume manufacturing, subcontract, job shop, and service companies. He has managed and supervised purchasing, engineering, power generation, nuclear power, and fossil power plants. He has worked on projects and projects related to nuclear power plants, regional utility companies, and global service companies.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founder and President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.

Mr. Robert R. Boyd has an M.B.A. degree in Petroleum Engineering from the University of Oklahoma. He has worked in the petroleum industry for over 30 years, with experience in the areas of contract negotiations, upstream operations, and deepwater projects. He is the founding President of R.R. Boyd Consulting, an independent petroleum engineering consultant firm. He has been a member of the SPE for over 30 years and has served as a member of numerous committees and task forces. He has published over 50 technical papers and has been a speaker at numerous conferences.
MR. SATINDER CHOPRA, MSc, MPhil (Physics) (2007) has 7 years’ experience as a geophysicist specializing in processing, pre-logging, special processing and interactive interpretation of seismic data. He has rich experience in processing various 2D and 3D seismic lines in different basins and onshore as well as offshore. He is skilled in the interpretation of seismic data and also has notable experience in 3D seismic data processing and interpretation. He has been involved in the development of new techniques for seismic data processing and interpretation and has published several papers in this area.

MR. KEVIN CUYLER is the Director of Technical Operations at PetroSkills, where he is responsible for the In-House Proposal and Logistical Support Team. He is also the Discipline Manager for the Multi-Discipline, Petroleum and Geosystems Engineering at the University of Texas at Austin.

DR. ISKANDER DIYASHEV is a director and a co-founder of Petroleum and Energy Technologies, an Inc., the petroleum industry and academic experience. He was awarded for Atlantic Richfield (ARCO) in Houston, Los Angeles, Dubai, and Dallas. Mr. Ernster’s final position on the SPE Steering Committee for their Global Workshop Series on Water Treatment equipment as well as to design new equipment. He was an SPE Distinguished Lecturer (2000), was an SPE Distinguished Lecturer (1999-2000), Distinguished Author (2000), and was selected as an outstanding Distinguished Author in 2001. He has over 30 years of experience as a petrophysicist doing research and applied work in the oil and gas industry in a number of capacities within research and operational environments. He spent over 34 years working for various exploration and production companies active in West Africa, the North Sea and Kurdistan. He has held a PhD from the University of Texas at Austin. He has over 30 years of experience as a petrophysicist doing research and applied work in the oil and gas industry in a number of capacities within research and operational environments. He spent over 34 years working for various exploration and production companies active in West Africa, the North Sea and Kurdistan.

DR. THEODORE (TED) FRANKIEWICZ is a Senior Scientist at the University of California, Davis, and has over 30 years of experience in the petroleum industry. He has been involved in the development and delivery of training programs. He was an SPE Distinguished Lecturer (2000), was an SPE Distinguished Lecturer (1999-2000), Distinguished Author (2000), and was selected as an outstanding Distinguished Author in 2001. He has over 30 years of experience as a petrophysicist doing research and applied work in the oil and gas industry in a number of capacities within research and operational environments. He spent over 34 years working for various exploration and production companies active in West Africa, the North Sea and Kurdistan.

DR. DALE FITZ  has 36 years of experience as a petrophysicist working for major companies such as Schlumberger and Halliburton. He is a senior reservoir engineer whose main interests are in numerical simulation, reservoir studies, and EOR. He started his career in 1981 with BP Canada, where he worked on the in-situ combustion project at Wolf Lake, as well as other thermal, chemical, and conventional oil projects. He has conducted over 285 reservoir studies, of which 218 involved simulation. He has taught on The Art of History Matching in numerical simulation. A 2003 evaluation of studies carried out in the early 1990’s showed that 90% of the models were not accurately matching the production data. Mr. Fitz has a PhD from the University of Calgary, all in Physics. Chris is a registered Professional Engineer in Alberta, Canada.
the founder of the petrophysical organization at Marathon’s Petroleum Technology Center. He has also held a number of management positions around the world with reservoir characterization, petrophysics, and testing for the company, including reservoir integration. He has served in a number of capacities associated with technology identification and advancement including the Board of Directors for the Research Partnership to Secure Energy for America, the Technology Screening Committee of the International Petroleum Technology Conference, and the Rice Alliance for Innovation and Entrepreneurship. He received a Bachelor’s Degree in Geology from Colorado State University, is a member of SPWLA and SPE, and is a registered Professional Geoscientist in the State of Texas.

**MR. RAFAEL GAY-DE-MONTELLA** is a Chemist and Engineer with 30+ years of experience. He is skilled in process engineering, consulting, design in plant operations, teaching and training of professionals and engineers. Mr. Gay has had more than 16 years of industrial experience, although focused in water, includes the Oil and Gas, Pulp and Paper, Food and Beverage, and fine chemicals industries and environmental knowledge and experience in Steam Activated Gravity Drainage (SAGD) and Cascading-Step Pressure Simulation (CSPS) extraction of Heavy Oil, produced water recovery process design. Rafael is knowledgeable in simulating corrosion conditions and HC-steam mix injection in wells. He is an expert in water treatment and water conditioning both for industrial and for municipal applications. Recently, Rafael has been involved in water treatment of fracturing waters and is proficient in using DLL, ROSA, and other CA modeling tools as well as extensive experience in MEE, and MVE evaporators. He has also worked with several high to low pressure steam boilers and has designed steam systems for complete refineries.

**DR. ALI GHALAMBOR** (now retired) was the American Petroleum Institute Endowed Professor and Head of the Department of Petroleum Engineering at the University of Louisiana at Lafayette. Professor Ghalambor has more than 35 years of industrial and academic experience. He has served as a consultant to many petroleum production and service companies as well as governmental agencies, and has written a number of technical papers, presented at numerous conferences, authored or co-authored 14 books and manuals and more than 180 technical articles published in various journals and conference proceedings. Dr. Ghalambor has delivered numerous invited technical presentations and courses in Drilling & Well Completion worldwide. He has received many awards including the Distinguished Achievement Award for Petroleum Engineering Faculty. Production and Operations Award, Distinguished Service Award, DeGolyer Distinguished Service Medal, and the Distinguished Member Award by the Society of Petroleum Engineers. Dr. Ghalambor served as a Consultant to the Organization of Petroleum Exporting Countries (OPEC), the Accreditation Board for Engineering and Technology. He has held many positions in the Society of Petroleum Engineers (SPE) including Director of the Central and Southeastern North America Region on the SPE Board of Directors and Chairman of the SPE International Symposium and Exhibition on Formation Damage Control. He received a PhD from Virginia Polytechnic Institute and State University and an MS and BS from the University of Southwestern Louisiana. He is a registered professional engineer.

**MR. DAN GIBSON** is a consulting engineer with over 35 years experience in production, completions, and well integrity issues from oil and gas reservoirs. He has worked for large international oil companies as well as independent companies, and has held a number of executive positions ranging from field engineering to senior management positions. He has been a part of the GE Oil & Gas consulting team for over 15 years. He has authored or co-authored over 50 papers and white papers, and has been an invited speaker at numerous conferences around the world. In addition, he has authored or co-authored 14 books and manuals and more than 180 technical articles published in various journals and conference proceedings. Gib has delivered numerous invited technical presentations and courses in Drilling & Well Completion worldwide. He has received many awards including the Distinguished Achievement Award for Petroleum Engineering Faculty. Production and Operations Award, Distinguished Service Award, DeGolyer Distinguished Service Medal, and the Distinguished Member Award by the Society of Petroleum Engineers. Dr. Ghalambor served as a Consultant to the Organization of Petroleum Exporting Countries (OPEC), the Accreditation Board for Engineering and Technology. He has held many positions in the Society of Petroleum Engineers (SPE) including Director of the Central and Southeastern North America Region on the SPE Board of Directors and Chairman of the SPE International Symposium and Exhibition on Formation Damage Control. He received a PhD from Virginia Polytechnic Institute and State University and an MS and BS from the University of Southwestern Louisiana. He is a registered professional engineer.

**DR. JAMES W. GRANATH** is a consulting structural geologist based in Denver, Colorado, who has worked in academia as well as the minerals industry for over 30 years. His research interests include mineral deposits, metamorphic terranes, and structural geology. He has authored or co-authored over 50 papers and white papers, and has been an invited speaker at numerous conferences around the world. In addition, he has authored or co-authored 14 books and manuals and more than 180 technical articles published in various journals and conference proceedings. Dr. Granath has delivered numerous invited technical presentations and courses in Drilling & Well Completion worldwide. He has received many awards including the Distinguished Achievement Award for Petroleum Engineering Faculty. Production and Operations Award, Distinguished Service Award, DeGolyer Distinguished Service Medal, and the Distinguished Member Award by the Society of Petroleum Engineers. Dr. Ghalambor served as a Consultant to the Organization of Petroleum Exporting Countries (OPEC), the Accreditation Board for Engineering and Technology. He has held many positions in the Society of Petroleum Engineers (SPE) including Director of the Central and Southeastern North America Region on the SPE Board of Directors and Chairman of the SPE International Symposium and Exhibition on Formation Damage Control. He received a PhD from Virginia Polytechnic Institute and State University and an MS and BS from the University of Southwestern Louisiana. He is a registered professional engineer.

**MR. Roger HINN** is the EVP for Sales and Member Engagement for PetroleumSolutions. He is a people oriented manager, possessing strong leadership and communication skills. A registered professional engineer, Ron’s 38-year career has spanned numerous roles including staff engineering, engineering supervision, corporate knowledge management and professional staffing and competency development. Ron is an active member of several professional associations including API, SPE and ARAMCO and serves on numerous committees, including Executive Committee of the ABET Board. Ron received a BS degree from the University of Tulsa in petroleum engineering.

**MR. RICHARD HENRY** is an independent reservoir simulation specialist who is either out on a sailboat or teaching for PetroleumSolutions in his spare time. He has degrees in industrial and petroleum engineering, and has performed over fifty reservoir engineering studies over two decades on a variety of different simulation platforms, field sizes and reservoir types. Before his career in petroleum engineering, Richard worked for Mobil in a number of engineering roles in fields and reservoirs around the world. He started working for Mobil as a drilling engineer, and for Texaco as a steamflood project manager in Colombia, and as a reservoir and simulation engineer in both research and Kuwait operations. Dr. Hinzelt was a Lecturer at Texas A&M University and an Associate Professor at New Mexico Tech. He has published numerous research papers and has been active in the development of new technologies. His areas of expertise include engineering consulting group. Dr. Hinzelt specializes in performing reservoir characterization, engineering and simulation studies. Studies include deep water Gulf of Mexico oil and gas fields, a granite gas reservoir offshore India, steamfloods in tight oil reservoirs in Russia and sands. He has been active in developing field development efforts within major international energy companies.

**DR. W. GREG HAZLETT** is an Independent Petroleum Engineering consultant operating out of Golden, Colorado. In addition to his consulting, Dr. Hazlett has over thirty years’ experience in the Oil & Gas industry, having worked for Mobil as a drilling engineer, and for Texaco as a steamflood project manager in Colombia, and as a reservoir and simulation engineer in both research and Kuwait operations. Dr. Hazlett was a Lecturer at Texas A&M University and an Associate Professor at New Mexico Tech. He has published numerous research papers and has been active in the development of new technologies. His areas of expertise include engineering consulting group. Dr. Hinzelt specializes in performing reservoir characterization, engineering and simulation studies. Studies include deep water Gulf of Mexico oil and gas fields, a granite gas reservoir offshore India, steamfloods in tight oil reservoirs in Russia and sands. He has been active in developing field development efforts within major international energy companies.

**MR. RON HINN** is the EVP for Sales and Member Engagement for PetroleumSolutions. He is a people oriented manager, possessing strong leadership and communication skills. A registered professional engineer, Ron’s 38-year career has spanned numerous roles including staff engineering, engineering supervision, corporate knowledge management and professional staffing and competency development. Ron is an active member of several professional associations including API, SPE and ARAMCO and serves on numerous committees, including Executive Committee of the ABET Board. Ron received a BS degree from the University of Tulsa in petroleum engineering.

**MR. AARON HORN** is the founder of Eco Resources, a training company aimed at providing leadership and technical training to multiple industries. He currently serves as Executive Vice President of Operations at Eco Resources Consulting Services, where he leads operations for water treatment and trucking, and assists in the leadership of water storage, transfer and disposal. His background includes Operations Engineering experience in both completions and production areas. Aaron served in the military rising to the rank of Captain and is the author of "Thinking Like an Engineering Consultant". He has been an active member of the United States Military Academy at West Point.

**MS. NANCY HOUSE** has been working as a geophysical interpreter (petroleum) for over 35 years for several major oil companies. She has a demonstrated capacity for acquiring, processing, and interpreting geophysical data for reservoir characterization, reservoir calculation or exploration evaluation in technically difficult or geologically complex areas. As a technical leader, she has been a key player in the development and implementation of leading edge technologies for evaluating and understanding unconventional reservoirs. These include borehole and surface microseismic for understanding hydraulic fracture geometry for optimization of development of unconventional resources.

**Our Instructors**

---

**DISCIPLINE ICON LEGEND ON PAGE 60**

---
MR. PATRICK MORAN is a completion consultant from Houston, Texas. He has twenty-years of well construction experience, having managed deepwater completion projects through design, planning and execution phases in the Gulf of Mexico, SE Asia, West Africa, and Australia. He has a BSc in Petroleum Engineering from the University of Alberta and an MSc in Petroleum Engineering from the University of Tulsa.

MR. JAMES D. MORSE is an applied structural geologist and President of Computational Geology, Inc. (CG). After studying structural geology and rock mechanics at Texas A&M University, Morse worked for Amoco, gaining valuable experience mapping the complex structures of the Idaho-Wyoming-Utah Thrust Belt. Seismic quality in thrust belts is often fair or poor, and the vast majority of mapping in this region is done in the subsurface, making structural geologists the key player in mapping these structures. He holds numerous patents involving unique technology, including a method for mapping complex thrust belts. Morse has over 50 publications in structural geology and has received numerous honors for his work in the field. Morse is an expert in mapping complex structures using modern structural analysis methods, and has worked on projects worldwide in extensional, compressional, and transpressional terrains.

MR. LARRY R. MOYER has over 30 years experience in all facets of the exploration, land and production phases of the oil and gas industry. He has extensive experience developing integrated geological, geophysical and engineering interpretations for use in exploration, field development and producing property evaluation, including geological and geophysical field and well-site supervision. He also has experience with oil, gas shale and hydrocarbon projects. He has experience with all aspects of managing operated and non-operated oil and gas properties with emphasis in accounting. Joint Operating Agreements, oil and gas sales contracts/marketing, AFE's, revenue audits, gas balancing audits, permitting, and filing of regulatory reports. He has
Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.

Mr. Andrew Pepper is Director of This is Petroleum Systems LLC - "TPS" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and - but with current focus on the Gulf of Mexico and Peru-Bolivia. He has held a variety of roles including responsibility for internal training at BP. Hess and BHP Billiton since 2000. Prior to forming TPS, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2005-2012, Andy is Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, he held a variety of roles in the oil and gas industry and a leading and consulting projects of various sizes in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, the Ukraine, Africa, USA, Mexico, China, Brazil, and India. He has been a member of numerous technical committees and societies and enjoys a national and international reputation as a communications consultant, trainer, and coach. He received degrees from Colorado State University and The New England Conservatory of Music and the University of Cincinnati.
headquartered to the University of Newcastle in 1986 to read a PhD in Surveying Sciences and received his first exposure to Geomatics. His thesis was entitled "Computational Techniques for Earthquake Damage Assessment" and was completed in 1989. After graduation, Martin continued his career in the
hydrocarbon exploration sector. This commenced with Halliburton Geophysical Services where he worked as Area Geophysicist with responsibility for all aspects of land, marine and 3D seismic acquisition and interpretation surveys. Later, Martin moved into software research and development, where he contributed to the design and testing of applications related to marine seismic surveying. This work led to implementing the software on many seismic survey operations globally from the Americas to Far East Asia. After completing his consulting career, he has focused on developing and applying his knowledge to the petroleum industry with emphasis on reservoir engineering.

Mr. Reynolds also has 21 years of experience as an SPE Short Course instructor since 2000. He has published technical papers on various phases of petroleum engineering and personnel development. He has delivered training and professional development courses on various management topics. Since retirement, Don has consulted on petroleum engineering, reservoir engineer, reservoir description, and formation damage research. His international oil and gas knowledge was developed through extended assignments in South America, Asia, the North Sea and the US. He is a member of the SPE, SPWLA, PSEGG, SEAFEX and a past president of the Aberdeen Chapter of the SPWLA. He received a BSc in Geology from Bedford College, London University.

Mr. Declan Reddy is an independent petroleum engineering consultant who specializes in production system optimization and subsea flow assurance. Prior to starting his consulting business, he was an Associate Professor of Petroleum Engineering at the University of Tulsa. He has 35 years of industry experience, both in production research and field operations in the area of multiphase flow. His primary areas of interest are multiphase flow in wellbore, flow lines and production equipment, multiphase meters and pumps, computational fluid mechanics, advanced separation technology, and paraffin and hydrate deposition in production flow lines and wells. He has also been a consultant to a number of oil companies for the last 10 years with Toaxco's Upstream Technology Department in Houston Texas, with the last four years as Director of Texaco's live oil multiphase flows loop in Humble Texas. At Tulsa University, he was actively engaged in teaching, research, and service, and has held a number of positions including managing the Oklahoma State University Seismic Data Processing Lab. He received a BS in Mechanical Engineering from Texas A&M University in Kingsville, Texas, an MS and PhD, from the University of Houston, both in Mechanical Engineering.

Mr. George Reynolds is a Safety Training Specialist with more than 17 years of experience in talent management, training and organizational development. He has developed and executed training programs and instructional materials covering varying client types throughout his career. He has a proven track record in achieving results and positively impacting business issues. Mr. Reynolds is a facilitator for LAB University, which is authorized by the International Association for Training and Development, and he has also directed education credits for staff and clients. Mr. Reynolds has a master's degree in Human Relations from the University of Oklahoma, and a bachelor's degree in Business Management from McKendree University. He also has a DACUM Course Director Certification from the McKendree University. He is a Master of Science in Training from Northwestern University Kellogg School of Management. His instructor certifications from ODII, Achieve Global, and ELI. Mr. Reynolds also has 21 years of distinguished military service.

Mr. Grant Robertson is a petroleum engineering consultant in Houston, Texas. He has worked in the oil and gas industry since 1974 for Chevron, British Petroleum, Ryder Scott and Aranakal in Saudi Arabia, and Amoco in Canada. He has been involved in various high-level technical and managerial positions. His work has been very diversified covering oil and gas reservoirs, onshore and offshore properties, primary, secondary and tertiary operations, and reservoir exploration and development projects. His responsibilities have been as a member of the engineering team, leading the associated planning, design, and construction of facilities. He has also managed production engineering and exploratory well testing. He has significant experience in preparing and conducting workshops and has been an SPE Short Course instructor since 2000. Mr. Robertson has published technical papers in refereed journals and has written many internal publications. He has been an active member of SPE since 1975 and has held numerous positions within different SPE organizations. He received a B.S. degree in Engineering Science and a M.S. degree in Chemical Engineering from the University of Toronto. He also received a B.P. degree in Chemical Engineering from the California Institute of Technology.

Mr. Leon H. Robinson has a 39-year career at Exxon and made contributions in many technology areas such as mud cleaners, explosive drilling, drilling data telemetry, subsurface rock mechanics, and drilling and hydraulic optimization techniques, tertiary oil recovery, on-site drilling workshop development, and worldwide reservoir management. Throughout his 25 years with Exxon, he delivered annual lectures at international drilling workshops and other workshops, worldwide, in the areas of reservoir management. Throughout his career, he has contributed to the development of reservoir management techniques and projects in the USA, Canada, Australia, India, Poland, South Africa, Colombia, Turkey, United Kingdom, Mexico, China, Kazakhstan, and Mongolia. He has also performed reservoir engineering studies and reserve evaluations for gas shales and conventional gas and oil projects throughout the world. He has been accomplished in the areas of petroleum reservoir engineering, enhanced oil recovery, and reservoir simulation. In 1998, 2001, and 2006 he has been granted in the areas of post-graduate studies supervision from the CAPCU-Cairo University. In 1998 and 2008 he was awarded an appreciation certificate for the significant contributions to the petroleum industry. He has taught petroleum engineering courses at King Saud University, and Cairo University. He was offered a visiting professor at the University of New South Wales in Sydney Australia, and at the University of New South Wales in Sydney Australia. Mr. Sayyah was involved in many consulting projects, and has been supervised ten of PhD and MSc students and has published more than 120 technical papers at international conferences and bulletin. His biography was published in the Who's Who in the World, Edinburgh, Scotland, he has a BSc and a MSc in Petroleum Engineering with a PhD from Penn State in Petroleum and Natural Gas Engineering as well as a Post Doctorate Fellowship from the University of Texas.

Mr. Michael C. Scruton-Wilson is a founding member of the BP Financial University responsible for developing and delivering finance and economic evaluation training throughout the BP organization. His leadership in negotiation was displayed by developing a consensus position with ExxonMobil and ConocoPhillips in agreements for the Alaska Gas Pipeline as well as shipping $20 billion of Federal Loan guarantees and tax benefits for the pipeline. He is experienced in project finance having completed agreements with the International Finance Corporation to finance a chemical plant expansion in Brazil and with Cibanco to provide loans for the gas pipeline. He has established himself as a leader in the oil and gas industry by holding various management/leadership positions during his career. He has an MA in Theology from Fuller Theological Seminary, an MS in Agricultural Economics (major in Marketing) from Cornell University and an MBA in Finance and International Studies from the University of Chicago.

Mr. John C. Seidle is a Vice President and Senior Reservoir Engineer with MHA Petroleum Consultants, a Denver based petroleum consulting firm. He has more than 30 years of experience in unconventional gas reservoirs, primarily coalbed methane. His coaled methane experience includes developing projects and programs, completing feasibility studies, managing projects in the USA, Canada, Australia, India, Poland, South Africa, Colombia, Turkey, United Kingdom, Mexico, China, Kazakhstan, and Mongolia. He has also performed reservoir engineering studies and reserve evaluations for gas shales and conventional gas and oil projects throughout the world. He has taught an industry coalbed methane course for over a decade. He has co-authored 21 technical papers, a monograph chapter and holds 6 patents. He is a Registered Professional Engineer in Colorado, Oklahoma, and Wyoming and a member of SPE, SPE and CIM. He received a PhD in Mechanical Engineering from the University of Colorado.
DR. SUBHASH N. SHAH is the Stephenson Chair Professor and Director of the Well Construction Technology Center at the Mhbewbo School of Petroleum and Natural Gas Engineering. He holds BS, MS, and PhD degrees in Chemical Engineering from the University of Saskatchewan and a PhD in Geology and Geophysics from Rice University.

DR. HAMIDREZA (MEHRAD) SOLTANZADEH is a Geomechanics Specialist at Canadian Discovery Ltd providing consulting services for geomechanical characterization, well planning, production improvement, and reservoir containment. Prior to joining CDL, he worked with GeoSas Solutions Ltd and Halliburton in various roles and has expertise in various geomechanical characterization and thermo-poro-mechanical studies for caprock integrity assessment for different SAGD, CO2, EUR, and CSS projects.

MR. ROD SIDLIE has worked in the upstream petroleum industry for 40 years including 35 years before retiring from Shell Oil/Royal Dutch Shell. He has also worked for both large (Oxy) and smaller (Sheridan Production) independent producers. His position as Reserve Manager/Engineer in each of these companies developed his knowledge from due diligence to Reserves Estimation and Reporting. He has delivered in-house Reserves Seminars across Canada for 18 years as a teaching assistant to the SPE Reserves Symposium conference in Toronto, as an instructor at the University of Oklahoma on Reserves and Economics at Texas A&M University for two years. He is a member of the Society of Petroleum Engineers (SPE) and the Society of Petroleum Evaluation Engineers (SPEE). He has been a past member of the SPE Oil and Gas Reserves Committee and currently serves on the SPE Reserve Determination Committee. He has been an SPE Past President and Director on the SPE Board of Directors. He has co-authored and presented several SPE technical papers on Reservoir Estimation topics with two published in the SPE Economics and Management Journal. He received a BS in Chemical Engineering from the University of Idaho.

DR. ROBERT A. SKOPEC is an independent consultant for Petrophysical Applications International, Inc., specializing in formation evaluation, core analysis, core research, rock mechanics, formation damage assessment, reservoir modeling, and laboratory design instrumentation. He has spent over 35 years in the industry, principally in core and log analysis in Venezuela, Argentina, Colombia, Peru, Mexico, the North Sea, Switzerland, Korea, China, the Gulf Coast, Alaska, and the Permain Basin. He received a BS in Geology and Petroleum Engineering from the Colorado School of Mines and an MS in Petroleum Engineering from the University of Texas at Austin. He has over 30 years of experience in geology, geophysics, health and safety leading and providing technical training in shaly sand analysis and other areas of petroleum geology and geophysics. He is a former Vice President of Sneider Exploration, Inc., an independent consultant with over 45 years' experience in geo-interpretation, petroleum geology, and geophysics. He is a former Vice President of Sneider Exploration, Inc., an independent consultant with over 45 years' experience in geo-interpretation, petroleum geology, and geophysics.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivering Bad News to Stakeholders and Decision Makers</td>
<td>We all hate delivering bad project news, but this Tip of the Month will give you some tips to better communicate negative information to stakeholders and decision makers. Learn about five different types of project issues, managing project relationships, and best practices for delivering bad news.</td>
</tr>
<tr>
<td>What You Need to Know About Production Logging</td>
<td>Production logging is a critical component of developing optimum modeling, completion and stimulation practices. This subsurface Tip of the Month (TOTM) discusses what you need to know to make your production logging both efficient and effective, and how to handle the unique challenges presented by horizontal wellbores.</td>
</tr>
<tr>
<td>9 Practical Tips for Motivating Oil and Gas Teams</td>
<td>This Tip of the Month discusses practical tips that have yielded strong positive results on oil and gas projects. The most important factor to a successful project is PEOPLE. There are many resources for monitoring projects, but most of these miss the key to a successful project. Processes and skills, with the right tools, at the right time, coupled with MOTIVATION is the major key to success.</td>
</tr>
<tr>
<td>How to Prevent Formation Damage</td>
<td>Formation damage can adversely affect production rates, efficiency and recovery factors of a well. Formation damage is often associated with the movement and bridging of fine solids, or chemical reactions resulting in precipitates and changes in wettability. In this Tip of the Month, we discuss the causes, their effects and how to prevent formation damage from occurring during well activities.</td>
</tr>
<tr>
<td>How to Effectively Manage Project Stakeholders</td>
<td>Have you ever had trouble communicating or even working with project stakeholders? This Tip of the Month will discuss the key to effectively managing those stakeholders and review an internal stakeholder management process all companies should use.</td>
</tr>
<tr>
<td>How Does Horizontal Well Planning Differ from Other Directional Wells?</td>
<td>In this Tip of the Month, you will learn about the steps of horizontal well planning including determining target constraints, build rate, tangent section, and more. Planning is one of the most important steps in drilling a horizontal well, and is very different than planning a normal directional well.</td>
</tr>
</tbody>
</table>

Check out full articles at petroskills.com/totm
positions at Champlin Petroleum Company and the Tennessee Division of Geology. He taught on carbonate depositional systems, sequence stratigraphy, carbonate petrophysics, physical geology, and marine geology at Louisiana State University, Montgomery College and Vanderbilt University. Currently, he is co-writing a book on carbonate reservoirs. In addition to publishing numerous technical papers, he was associate editor for the American Association of Petroleum Geologists Bulletin. He is a member of the American Association of Petroleum Geologists, Geological Society of America, Society for Sedimentary Research, Houston Geological Society, and International Association of Sedimentologists. He received a BA and MS in geology from Vanderbilt University, and a PhD in sedimentology from Louisiana State University.

**MR. DAVID (DAVE) WALDREN** joined the embryonic British National Oil Corporation in 1977, after 7 years of postdoctoral research in high-energy particle physics. In 1979, he was employed by Intercomp as a reservoir engineer working on simulator development and reservoir studies. In 1983, he became Technical Director of International Petroleum Engineering Consultants Ltd. and a Managing Director for the Asian Development Bank. Since 1988, he has been an independent consultant as well as a professor in petroleum engineering at Imperial College of Science and Technology, London. He has wide experience using a variety of commercial reservoir modeling systems. During his career he has worked on oil and gas fields in 31 countries on 6 continents. He has a strong theoretical and research background, which is applied in his consulting activities including advising a major oil company on the day-to-day operational and medium/long term development of an off-shore oil field as well as the estimation of different classes of reserves for SEC requirements. Many of the projects he performed involved the use of VIP and Eclipse simulation systems. He also has many years experience with different commercial reservoir modeling systems and has been actively engaged in studies and/or training using IMEX (CMG), Eclipse and Frontsim (Geocqast), VIP (Landmark), Athos (Beicip Franlab) and MORE (Roscoe). He was a SPE Distinguished Lecturer for 2001–2002. He has a BSc, BSc Honours and a PhD in physics from the University of Liverpool, England.

**MR. COLIN WATSON** has over 36 years’ broad experience in petrochemicals, primarily in engineering support and process safety management. He joined PetroSkills as an instructor in 2014. His experience includes assignments in technical support, operations, turnarounds, project execution and HSE and engineering management. From 2006 he has worked as an independent Engineer and Process Safety Consultant working with oil and gas clients. He has worked primarily with BP to design, develop and facilitate their global Process Safety training and awareness programs both for engineering and operations teams. In a varied 28-year career in BP he has been actively engaged in studies and/or training using IMEX (CMG), Eclipse and Frontsim (Geocqast), VIP (Landmark), Athos (Beicip Franlab) and MORE (Roscoe). He has written and presented at the Mary K. O’Connor Process Safety Symposium and written many technical papers on Process Safety. He is a member of SPE and SPEE, has authored several technical papers, and holds two US Patents. He received a BS in petroleum engineering from the Colorado School of Mines and an MBA in finance from the University of Colorado.

**MR. LARRY WOLFSON** has 34 years’ experience in planning and supervising well construction, including ERD, slim-hole and sub-sea wells. He received a BS in mechanical engineering from California State University at Northridge. In addition he has a strong theoretical background in mechanical engineering and has been actively engaged in studies and/or training using IMEX (CMG), Eclipse and Frontsim (Geocqast), VIP (Landmark), Athos (Beicip Franlab) and MORE (Roscoe). He has written and presented at the Mary K. O’Connor Process Safety Symposium and written many technical papers on Process Safety. He is a member of SPE and SPEE, has authored several technical papers, and holds two US Patents. He received a BS in petroleum engineering from the Colorado School of Mines and an MBA in finance from the University of Colorado.

**MR. CLYDE YOUNG** has over 30 years of diverse experience in operations and maintenance of production and processing facilities. He includes significant experience in operations and development of management systems for gas processing and water/wastewater treatment facilities. This includes operating procedure development, training program development, compliance auditing, vulnerability assessment, emergency planning and mechanical integrity program development. Mr. Young provides many of our clients with PHA services, compliance audits and Hazards Reviews. Mr. Young has presented at the Mary K. O’Connor Process Safety Symposium and written several papers that have been published in various industry publications. Mr. Young holds a B.S. in Social Sciences from the University of Wyoming–Laramie, Wyoming.

**MR. ROBERT (BOB) V. WERNERMARK** is a seasoned engineer with international and domestic experience. He has worked both on and offshore including underbalanced, horizontal, multilateral, coaled methane, and geothermal drilling wells operations. As a team leader, he has run successful drilling and completion assignments and partnering programs. Mr. Wernermark has also managed a research drilling test facility and two US Department of Energy multi-million dollar projects. He is retired president of Grand Directions, LLC, drilling low cost horizontal wells for the parent company Grand Resources, Inc. and other partners. Mr. Wernermark has authored and co-authored over 24 technical papers and he has been the instructor for numerous public and in-house courses, ranging from basic drilling classes to casing design and well control. In addition, he has taught advanced topics including horizontal drilling and multilateral completions. In this capacity, he communicates clearly with all levels of students, field and office employees, management, third party contractors and partners, and the public. He received a BS degree in Petroleum Engineering from Montana College of Mineral Sciences and Technology.

**MR. RONN WILLIAMSON**, CPPM, CPA, has provided education programs and consulting globally in supply management for the oil and gas industry through PetroSkills and John M. Campbell & Co for the past eleven years. Most recently, he was the Technical Training Director for John M. Campbell & Co. Working with major oil companies, he created the PetroSkills discipline competency maps for strategic supply chain management and led the supply chain discipline network for several years. Ronn has almost 40 years of supply chain management experience, with 16 years of operational management experience and 21 years of consulting and training around the globe. As a consultant, Ronn has designed and managed projects for more than fifty organizations in numerous industries to deliver improved organizational policies and procedures, increased leverage of purchasing power, reduced inventories, and improved resource utilization in the supply chain. Ronn gained his supply chain management expertise in the first half of his career through ever-increasing executive and professional management roles at Thermo King Corporation, a billion-dollar global manufacturing subsidiary of Westinghouse Electric Corporation. Ronn received a BS in Physics from St. John’s University and a BME in Engineering and an MBA from the University of Minnesota. He has been a member and past chapter president, of the American Production and Inventory Control Society (APICS). He has been a member of the National Association of Purchasing Management-Twin Cities (NAPM-TC), the Manufacturers Alliance and the International Association for Commercial Contracts Management (IACCM). Ronn is certified at the Fellow Level by APICS and has a lifetime purchasing certification by the Institute of Supply Management (ISM).

**MR. SCOTT J. WILSON** has 25 years of varying oil and gas experience spanning all major petroleum producing regions in the world. He is a Vice President with Ryder Scott Company, L.P., with offices in Houston, Denver and Calgary. Prior to joining Ryder Scott, he was a Principal Engineer with the Atlantic Richfield Company, advising on well performance issues. He has taught over 100 sessions on NODAL analysis, gas reservoir engineering, production forecasting, and advanced reservoir engineering. He coordinated the development of several Windows based NODAL and Decline programs, two of which are the primary tools used at the Prudhoe Bay and Kuparuk oilfields. He is a Registered Professional Engineer in Alaska, Colorado, and Wyoming, a member of SPE and SPEE, has authored several technical papers, and holds two US Patents. He received a BS in petroleum engineering from the Colorado School of Mines and an MBA in finance from the University of Colorado.

**MR. RICHARD (DICK) G. WRIGHT** has over 25 years of worldwide oilfield experience, including management and implementation of directional drilling services and also has over 6 years’ experience training. His oilfield experience includes resident positions in Southeast Asia and the Middle East. His areas of specialty include drilling operations technical training and drilling team leadership training. He is fluent in Spanish and is widely traveled in Central and South America. He received a BS in pre-veterinary medicine from New Mexico State University and an MBA in International Management from the American Graduate School of International Management.

**MR. CLYDE YOUNG** has over 30 years of diverse experience in operations and maintenance of production and processing facilities. He includes significant experience in operations and development of management systems for gas processing and water/wastewater treatment facilities. This includes operating procedure development, training program development, compliance auditing, vulnerability assessment, emergency planning and mechanical integrity program development. Mr. Young provides many of our clients with PHA services, compliance audits and Hazards Reviews. Mr. Young has presented at the Mary K. O’Connor Process Safety Symposium and written several papers that have been published in various industry publications. Mr. Young holds a B.S. in Social Sciences from the University of Wyoming–Laramie, Wyoming.

**MR. ROBERT (BOB) V. WERNERMARK** is a seasoned engineer with international and domestic experience. He has worked both on and offshore including underbalanced, horizontal, multilateral, coaled methane, and geothermal drilling wells operations. As a team leader, he has run successful drilling and completion assignments and partnering programs. Mr. Wernermark has also managed a research drilling test facility and two US Department of Energy multi-million-dollar projects. He is retired president of Grand Directions, LLC, drilling low-cost horizontal wells for the parent company Grand Resources, Inc. and other partners. Mr. Wernermark has authored and co-authored over 24 technical papers and he has been the instructor for numerous public and in-house courses, ranging from basic drilling classes to casing design and well control. In addition, he has taught advanced topics including horizontal drilling and multilateral completions. In this capacity, he communicates clearly with all levels of students, field and office employees, management, third party contractors and partners, and the public. He received a BS degree in Petroleum Engineering from Montana College of Mineral Sciences and Technology.

**MR. RONN WILLIAMSON**, CPPM, CPA, has provided education programs and consulting globally in supply management for the oil and gas industry through PetroSkills and John M. Campbell & Co. for the past eleven years. Most recently, he was the Technical Training Director for John M. Campbell & Co. Working with major oil companies, he created the PetroSkills discipline competency maps for strategic supply chain management and led the supply chain discipline network for several years. Ronn has almost 40 years of supply chain management experience, with 16 years of operational management experience and 21 years of consulting and training around the globe. As a consultant, Ronn has designed and managed projects for more than fifty organizations in numerous industries to deliver improved organizational policies and procedures, increased leverage of purchasing power, reduced inventories, and improved resource utilization in the supply chain. Ronn gained his supply chain management expertise in the first half of his career through ever-increasing executive and professional management roles at Thermo King Corporation, a billion-dollar global manufacturing subsidiary of Westinghouse Electric Corporation. Ronn received a BS in Physics from St. John’s University and a BME in Engineering and an MBA from the University of Minnesota. He has been a member and past chapter president, of the American Production and Inventory Control Society (APICS). He has been a member of the National Association of Purchasing Management-Twin Cities (NAPM-TC), the Manufacturers Alliance and the International Association for Commercial Contracts Management (IACCM). Ronn is certified at the Fellow Level by APICS and has a lifetime purchasing certification by the Institute of Supply Management (ISM).
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 to 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
Contact and Registration

To register for a course, or for questions on inhouse training or any of our other solutions, contact our Customer Service Department at +1.918.828.2500 or training@petroskills.com.

CUSTOMER SERVICE
Tulsa...................... +1.918.828.2500
Toll-free....................+1.800.821.5933
training@petroskills.com

PETROSKILLS
CONFERENCE CENTER
Houston.................. +1.832.426.1200

certificates, professional development hours (PDH), and continuing education units (CEU)

A Certificate of Completion is awarded to each participant who satisfactorily completes the course and will be awarded by the instructor(s) on the final day.

PetroSkills® course hours can be used to satisfy PDHs for licensed engineers in most US states. In many instances, course hours can be used for international CEU credit also. Every course certificate tells the number of CEUs earned and also can be used to submit to your licensing board or accrediting body for approval.

TERMS AND CONDITIONS

REGISTRATION AND PAYMENT
It is recommended participants register early due to limited seating. However, registrations can be submitted up to the last business day before class provided there are seats available. Registrations are confirmed when payment is received. Payment is due upon receipt of invoice and no later than 30 days before class. For registrations submitted less than 30 days before class, payment is due immediately otherwise a seat in the course cannot be guaranteed. Tuition fees are due and payable in US dollars. Please contact the Customer Service Department customer.service@petroskills.com if you cannot meet the payment requirements as registrations are not automatically cancelled when payment is not received.

TUITION FEES
Tuition fees include tuition, course material, daily refreshments and a non-refundable registration fee of $100.00 (USD) per five days of training or less. As a reminder a seat in the course is not confirmed until payment is received. Please note tuition fees do not include living costs. Participants are responsible for booking and paying for their own hotel accommodations. When possible, PetroSkills will reserve a block of sleeping rooms at suggested hotel(s). Participants should contact the suggested hotel directly at least three weeks before the course begins. Remember to mention PetroSkills and/or the course title to receive a discounted rate, if applicable.

Note: Where applicable due to government regulations, Goods and Services Tax (GST) or Value Added Tax (VAT) will be added to the total tuition fees. For events in the UK, the merchant of record contracting with cardholder is PetroSkills UK Limited, a UK entity. For events in Canada, the merchant of record contracting with cardholder is PetroSkills Canada Inc., a Canada entity. For events in Australia and the UAE, the merchant of record contracting with cardholder is PetroSkills LLC, a United States entity.

CANCELLATIONS, TRANSFERS, SUBSTITUTIONS, AND REFUNDS
A minimum of 30-day notice is required to cancel or transfer otherwise the tuition fee is forfeited or remains due if not already paid. Cancellation requests received 30-days or greater before class will be honored and tuition refunded, less the non-refundable registration fee mentioned above, provided there were no previous late requests to transfer. Transfer requests received 30-days or greater before class will be honored and tuition is transferrable provided there were no previous late request to transfer. Note: should there be a difference in tuition, the difference will be due. Only one transfer per initial registration is permitted.

Late requests to transfer into a future session of the same course will be considered provided the tuition is paid and the requested session is open for enrollment. Substitutions of participants are permitted at any time without penalty.

Please contact the Customer Service Department customer.service@petroskills.com if you need to cancel, transfer, or make a substitution. Transfers and cancellations will not be honored, and tuition is forfeited for courses that have reached maximum participation regardless of the amount of notice given. PetroSkills reserves the right to cancel any course session at any time. The decision to cancel is generally made approximately two weeks before class. When a course cancels registered participants will be given the opportunity to transfer to another course or receive a full refund, provided the enrollment was not transferred into the cancelled course late. Keep this in mind when making travel arrangements (airline tickets, hotel reservations, etc.), as PetroSkills cannot be responsible for any fees incurred for cancelling or changing your travel arrangements.

We reserve the right to substitute course instructors as necessary.

DISCLAIMER
PetroSkills reserves the right without payment of consideration to videotape, film, photograph and/or record course sessions and course participants in any media type and to alter or edit these images for use in its publications, including website entries.

The use of any recording device (audio or video) by participants during a PetroSkills course is strictly prohibited. The unauthorized use of a recording device during a PetroSkills course presentation shall be grounds to remove the participant and confiscate or destroy the related recording. No portion of any PetroSkills course may be recorded digitally, on film, video tape, audio tape or other recording device or be reproduced photographically or by any sight or sound device. All PetroSkills course presentations are the sole property of PetroSkills.

Remember to mention PetroSkills and/or the course title to receive a discounted rate, if possible, PetroSkills will reserve a block of sleeping rooms at suggested hotel(s). Participants are responsible for booking and paying for their own hotel accommodations. When possible, PetroSkills will reserve a block of sleeping rooms at suggested hotel(s). Participants should contact the suggested hotel directly at least three weeks before the course begins. Remember to mention PetroSkills and/or the course title to receive a discounted rate, if applicable.

Note: Where applicable due to government regulations, Goods and Services Tax (GST) or Value Added Tax (VAT) will be added to the total tuition fees. For events in the UK, the merchant of record contracting with cardholder is PetroSkills UK Limited, a UK entity. For events in Canada, the merchant of record contracting with cardholder is PetroSkills Canada Inc., a Canada entity. For events in Australia and the UAE, the merchant of record contracting with cardholder is PetroSkills LLC, a United States entity.

A Certificate of Completion is awarded to each participant who satisfactorily completes the course and will be awarded by the instructor(s) on the final day.

PetroSkills® course hours can be used to satisfy PDHs for licensed engineers in most US states. In many instances, course hours can be used for international CEU credit also. Every course certificate tells the number of CEUs earned and also can be used to submit to your licensing board or accrediting body for approval.
PetroSkills Blended Learning Skill Modules™ combine industry knowledge, expertise, content, and technology to develop workforce competency with the added benefit of:

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

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

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