NEW in 2020

- Accredited H&S Professional: GradIOSH, CMIOSH and ASP by Applied Learning (pg 47)
- Construction Management for the Project Professional (pg 58)
- Introduction to Fiber Optics for Well Surveillance (pg 26)
- Operations Crew Resource Management (pg 7)
- Petroleum Project and Program Management Essentials (pg 56)
- Petroleum Project Changes and Claims Workshop (pg 58)
- Spill Control and Remediation Engineering (pg 47)
- NEW PetroAcademy Virtual/Blended Learning Options:
  - Production Logging (pg 44)
Doing more with less is how we thrive, 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 52 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:

- Accredited H&S Professional: GradIOSH, CMIOSH and ASP by Applied Learning (HSP) - page 47
- Construction Management for the Project Professional (FPM64) - page 58
- Introduction to Fiber Optics for Well Surveillance (IFOS) - page 26
- Operations Crew Resource Management (OCRM) - page 7
- Petroleum Project and Program Management Essentials (P3ME) - page 56
- Petroleum Project Changes and Claims Workshop (PPCC) - page 58
- Spill Control and Remediation Engineering (SCRI) - page 47

In addition to our instructor-led programs, our digital learning solutions and professional services continue to lead the industry; see page 3 for more details.

Also, we are excited to announce that we have expanded our capabilities in operator training by acquiring Simulation Solutions Inc. This allows us to offer you a dynamic library of hands-on simulator training for console and outside operators. See petroskills.com/ssi for details.

We are also proud that our blended/virtual learning program, PetroAcademy™, continues to grow. 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. For more information, see the back cover, or petroskills.com/blended.

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.

Ford Brett
CEO PetroSkills
The PetroSkills Alliance was founded in 2001 by Shell, BP and OCGI, to provide “important but not unique” competency-based training to the oil and gas workforce. Alliance members are provided opportunities to collaborate around challenges facing organizational competency and workforce development.

Alliance benefits include:

- **Global Benchmarks and Shared Best Practices**: Leverage processes and networks to align with strategic goals.
- **Competency Development and Assurance**: Common methodology and tools assure industry wide critical skills.
- **Learning and Sharing Networks**: Speed time to solutions through regional workshops, learning forums, and community of practice.
- **Full Spectrum of Learning Resources**: Access instructor-led training, e-Learning, or blended learning activities.
- **Continuing Collaborative Discussions**: The PetroSkills Alliance spans the full energy value chain. Member companies include: bp, Shell, Halliburton, ConocoPhillips, Chevron, Repsol, Marathon Oil, Noble Energy, BHP, Sasol, Cheniere Energy, and Simulation Solutions, Inc.
Our Approach to Workforce Development

As a trusted advisor to the industry for over 50 years, PetroSkills understands the challenges that our clients face every day.

We can help:

• Bridge knowledge gaps in your workforce and develop an enterprise-wide training standard
• Accelerate time to competency for Engineers, Project Managers, Operators, and Technicians
• Assure the integrity of your investments by meeting regulatory and compliance demands

PetroSkills has the experts, processes, and technology to provide a comprehensive workforce development plan. We enable companies to develop a workforce able to meet business challenges, enhance effectiveness, achieve compliance goals, mitigate risk, and improve operations. With our deep industry experience and competency building expertise, PetroSkills is the industry’s trusted workforce development advisor.

For more information please email solutions@petroskills.com or visit our website at www.petroskills.com/solutions
Reduced time to competency
Eliminated travel expense
Flexibility—less time away from work
Learning applied at point of need

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:

Virtual Instructor-Led Training Session

PetroCore® Reference Articles

Moderated Discussion Forum

E-Learning

For more information, visit petroskills.com/blended
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
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 oils and enhanced oil recovery technologies.

DESIGNED FOR
Both technical and business oriented professionals who are either new to the upstream oil and gas industry or experienced in one part, but could benefit from a wider point of view. OVP will likewise deliver for non-industry personnel a broad, basic knowledge set of multiple E&P topics: Legal, Financial, Accounting, Management, and Service Company team members will certainly benefit.

YOU WILL LEARN
• The critical importance the industry plays on the world’s economic stage, including discussions of pricing, global reserves and key short/long-term energy trends.
• Business and exploration elements critical to the success of organizations in search of new reserves.
• Methods by which new field prospects are evaluated and risk factors assessed (Geology, Geophysics, Petroleum)
• How exploration rights are acquired (Land themes, International Concessions)
• The basic process for drilling and evaluating an exploration well (Drilling, Petrophysics, Testing)
• Major steps required to appraise a new discovery and estimate its commerciality (Reservoir Engineering)
• Strategies to maximize the value of an oil or gas field asset
• How geology and reservoir management plans are used to guide new field development
• Major steps in the design, construction, and commissioning of facilities
• Basic technical and operational steps required to produce an oil or gas field (Production Engineering)
• Types of opportunities to optimize older fields and increase production

COURSE CONTENT
The business of E&P • Hydrocarbon origin • Exploration – acquisition of exploration/development rights • Exploration – prospect generation and evaluation • Appraisal – asset characterization and reserve quantification • Development – drilling, completion, and facilities • Produce Asset – recovery optimization strategies

Basic Petroleum Engineering Practices – BE

BASIC 5-Day

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

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

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

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

Basic Drilling, Completion, and Workover Operations – BDC

BASIC 5-Day

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

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

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

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

YOU WILL LEARN
• How to understand the depositional and stratigraphic framework of the McMurray Formation
• How to understand 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

Field Study – Heavy Oil Resources – HOF5

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.

DESIGNED FOR
Anyone of any discipline who wants a hands-on understanding of the Athabasca Oil Sands.

YOU WILL LEARN
• How to understand the depositional and stratigraphic framework of the McMurray Formation
• How to understand 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 $4325
PETROSKILLS.COM/BDCONLINE

2020 Schedule and Tuition (USD)

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<td>KUALA LUMPUR, MYS</td>
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† includes field trip

2020 Schedule and Tuition (USD)

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† includes field trip

Any course is available in-house at your location. Contact us today.
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 technologies 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
• 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 the Alberta 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 • 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 in-situ oil sands recovery projects • Overview of thermal well completions and production facilities • Reserves and economics

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
• 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) • The process of developing heavy oil/oil sands resources • Field and production development strategies • Oil sands mining details and reclamation • Environmental challenges for oil sands resources • Heavy oil and in-situ oil sands recovery process overview • 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 • 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 coalbed methane
• Recognize and describe shale play differences and critical reservoir properties to identify the sweet spots
• Evaluate gas and oil in place
• Apply different resource evaluation techniques recognizing the advantages and disadvantages of each technique
• Apply drilling, completion, and stimulation technology to shale gas and shale oil formations
• Evaluate and forecast individual well and reservoir performance
• Determine how to estimate 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 • Geology: setting, rock properties, petrophysical considerations • The role of seismic data in field evaluation • Drilling: vertical vs. horizontal wells; pilot holes; fluids; MWDB and LWD; wellbore sizes and lateral; drilling challenges; mechanical considerations • Completions: casing 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

Operations Crew Resource Management – OCRM

INTERMEDIATE 3-DAY

NEW

Why do experienced, competent personnel make mistakes during the planning or implementation of operations? How does an organization address these potential mistakes? High-risk industries introduce and practice non-technical skills (NIS) coined as Crew Resource Management (CRM) to address human errors. In the late 1970s, the airline industry was plagued with many crashes and resulting fatalities. Often investigations yielded no evidence of design or mechanical failures, rather poor or inconsistent decision making was the major contributing factor to the incident (e.g. poor communications, distractions, leadership actions, lack of teamwork, changing situation without knowledge, stresses, and fatigue played a role in the incidents). The industry came together focusing on six non-technical skills, naming the effort CRM. After 40 plus years, CRM is still a major component of all aviation industry training. Other high-risk industries began to incorporate CRM into their organizations to reduce the number of incidents. However, of recent, those and other industries have seen performance improvements with the incorporation of CRM. Introducing and practicing NTS has reduced nonproductive time thus improving performance delivery. The oil and gas industry has only recently started to introduce CRM skills. Initially the industry introduced CRM/NTS into well control training post the Deepwater Horizon (DWH) incident, as several DWH investigations and reports referenced human factor causes. IADC and IWCF have accredited enhanced well control training which requires CRM/NTS components. Several operators and contractors have started to include CRM/NTS in their “drill the well on paper” or “drill the well on simulator” exercises, recognizing non-productive time improvements.

Course Content
Situational Awareness (gather information, share understanding, possible consequences, problems and contingencies) • Decision Making (objective and goal, previous experience, risks, options, check) • Communications (exchange information, explain context, clear and concise, relevant inclusion) • Teamwork (responsibilities, co-ordinate tasks, resolve gaps/applications, working relationships, support efforts) • Leadership (take charge, provide direction, prioritize tasks, delegate, organizational process) • Stressors/Factors that Impact Human Performance (identify, mitigate, practice resilience, recognize efforts)

2020 Schedule and Tuition (US$)

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<th>Location</th>
<th>Dates</th>
<th>Registration Fee</th>
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<td>10-14 AUG</td>
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<td>LONDON, UK</td>
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* plus computer charge

See website for dates and locations.
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>Instructors</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Dr. James Granath</td>
<td>Geology</td>
</tr>
<tr>
<td>Mr. Peter Bartok</td>
<td>Geology</td>
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<tr>
<td>Dr. Steven Boyer</td>
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<td>Mr. Satinder Chopra</td>
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<td>Dr. James Granath</td>
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<td>Dr. Andrew Harper</td>
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<tr>
<td>Mr. Dave McGee</td>
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<td>Dr. Tom McKinley</td>
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<td>Mr. James Morse</td>
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<td>Mr. Larry Moyer</td>
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<td>Dr. John Pigott</td>
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2020 Schedule and Tuition (USD)

- HOUSTON, US
  - 11-15 MAY
  - $4450
- KUALA LUMPUR, MY
  - 13-17 JULY
  - $5350
- LONDON, UK
  - 20-22 OCT
  - $5145+VAT
Computer-Based Subsurface Mapping  
- CSM

**FOUNDATION 5-Day**

For geoscientists, contour maps have long been one of the most common tools used to convey information. In the modern petroleum industry, contour maps are generally derived from grids created in interpretation software packages. Maps, or the grids themselves, are used to evaluate prospectivity, estimate prospect volumes, pick drilling locations, and are the inputs for basin models, and static reservoir models. Despite the importance of these maps and the underlying grids, there is often a poor understanding of how the grids are generated and what the implications may be for the final map. The underlying theme in this course is to think about what you are mapping. Common gridding algorithms and parameters are reviewed, with an emphasis on their strengths and weaknesses for different geological problems and input data sets. Participants are asked to generate a variety of maps from different input data types, seeing the impact that varying parameters can have on a single input data set. Participants will also utilize various methods of quality control, grid editing, and grid manipulation (operations).

**DESIGNED FOR** Geoscience professionals and support staff who generate structure, isochores, 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 structure maps  
- Creating isochores/attribute maps from well data  
- Grid quality control  
- Grid editing  
- Grid operations  
- Creating and combining stoteip maps  
- Volumetrics

**Carbonate Reservoirs  
- PCR**

**FOUNDATION 5-Day**

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

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

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

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

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

**Sandstone Reservoirs  
- SR**

**FOUNDATION 5-Day**

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

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

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

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

**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 out of why maps are interpreted 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 Grishon’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 maps and interpreted structure  
- Construct predictive cross sections  
- Apply the best techniques for projecting data  
- Make fault maps and integrate them with horizon maps  
- Build a complete 3D interpretation  
- Recognize valid and invalid fault surfaces  
- Interpret folds and faults from dipmeters  
- Construct juxtaposition (Alian) 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-domain cross sections  
- Data projection  
- Trend and plunge of folds on tangent diagrams  
- 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

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**2020 Schedule and Tuition (USD)**

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**2020 Schedule and Tuition (USD)**

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Geochemistry: Tools for Effective Exploration and Development – MGT

Geomechanics for Heavy Oil – HOGM

Geomechanics

Foundations 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, geochemists, petroleum engineers, managers, and technical personnel. No background in geochemistry is needed.

You Will Learn How To

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

Course Content

Assess source rock quality, maturity, and petroleum-generating potential • Applications 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

Petroleum Systems Analysis – PSA

Petroleum Systems

Foundations 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 familiarly 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 up understanding of the genesis of their reservoir, or field. The course provides a refresher in new concepts in this field for geoscientists at a fundamental level.

You Will Learn How To

• Understand reservoir and reservoir fluid properties that govern deliverability, well performance, and development... pro and con analysis • Fluid flow physics analysis • Geophysical approaches to heavy oil • Properties of heavy oil and rock physics analyses • General phase behavior of hydrocarbons and heavy oil • Properties of heavy oil and rock physics analysis • Geophysical approaches to characterization of heavy oil reservoirs • Measuring and monitoring heavy oil properties • Methods of extraction of heavy oil (CHOPS, SAGD, etc.) • Challenges for heavy oil production • Seismic monitoring of hot and cold heavy oil production • Optimization of Canadian heavy oil production through reservoir characterization • Environmental issues • Jeepady exercises on each of these units

Production Geology for Other Disciplines – PGD

Production Geology

Foundations 5-Day

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

Designed for

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

You Will Learn How To

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

Course Content

Correlation and stratigraphy • Structural interpretation • Sedimentology • Claystone/organic deposits including an introduction to Unconventional Reservoirs • Reservoir Geology – Reservoir characterization and modeling • Volumetrics • Well planning • Reservoir appraisal • Field development • Uncertainty analysis

See website for dates and locations.
Sequence Stratigraphy: An Applied Workshop – SQS

FOUNDATION 5-Day

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

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

YOU WILL LEARN HOW TO
• Identify unconformities and sequence boundaries
• Identify paraeconformities and utilize in correlation
• Identify incised 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 levels
• Build predictive stratigraphic models
• Utilize sequence stratigraphy to develop exploration/exploitation strategies

COURSE CONTENT
Seismic geometries • Unconformities • Relative sea level • Eustasy • Parasequences and their stacking patterns • Paraecofacies 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 shell sands • Sequence stratigraphy in a mixed clastic/carbonate province • Exploration and production scaled case histories and strategies

Structural Styles in Petroleum Exploration – ST

FOUNDATION 5-Day

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

DESIGNED FOR
Exploration geologists, geophysicists, engineers, and geoscience managers.

YOU WILL LEARN HOW TO
• Recognize all the different hydrocarbon-bearing structural styles in map and cross-section
• Describe 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 understand and predict trap geometry
• Use restoration and balance to validate an interpretation and show the structural evolution

COURSE CONTENT
Comparative structural geology • Structural families and styles • Mechanical principles governing fold and fault geometry • Predicting structure from stratigraphy • Folding vs. faulting • Palinspastic restoration of cross sections • Structural validation criteria • Sequential restoration and growth history • Regional arches and domes • Compaction and subsidence solution • Wrench faults: simple, convergent, and divergent • Conjugate and domino-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 • Basement-involved extension • Half-graben and full graben rift systems • Domino-style extension • Diapirs • Salt sheets • Rio and coastal-foreland pseudotensional fault systems • Plate-tectonic habitability of structural assembles • Tectonic synthesis and exploration project

Analysis of Structural Traps in Extensional Settings – ESS

INTERMEDIATE 5-Day

FIELD TRIP

Extensional terrains provide some of the world’s largest known and most prolific oil provinces and are the fundamental underpinning of most continental and deepwater margins. As one of the most complex structural styles, they are present on all continents and form most continental shelves. The advent of 3D seismic technologies has revolutionized structural mapping, but 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, and seismic data along with model analogs to support structural interpretation in a wide range of extensional environments: thin-skinned environments along with the underlying, often hyperextended passive margins as well as intrcontinental rifts. Fault linkage, relay ramp, transfer systems, and intrabasinal structural geometries are investigated in 3D using predictive kinematic and restoration thinking. The course covers the field level all the way up to basin-scale architecture, and the role of salt and strike-slip tectonics in the development of extensional basins. The typical traps related to extensional geometries are surveyed using real world examples, with some review of deformational effects on reservoir quality. Exercises include typical seismic examples and field studies. The fundamentals of fracture dynamics are covered in connection with the evolution of extensional faults, as are such important topics as fault sealing issues and inversion. The instructor is happy to accept examples from your company for analysis in the class as one of the demonstration exercises. The 3-day classroom course is followed by a 2-day field trip to the Death Valley area to reinforce the material from the classroom.

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

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

COURSE CONTENT
Geological framework • Geothermal criticals • Geochanical criticals • Migration criticals • Reservoir criticals • Seal and trap criticals • Timing criticals • Risk and decision-making

2020 Schedule and Tuition (USD)

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Compositional and Transpositional Structural Styles – CPST

INTERMEDIATE 5-Day

Compositional and transpositional 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 outcrop, subsurface, seismic sections, and model analogs that provide structural interpretation in a wide range of compositional and transpositional 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.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Distinguish the characteristics of compositional and transpositional deformation including distinguishing thin-skinned and basement-involved styles
• Identify the fundamental characteristics of the wrench assembly
• Identify the characteristics of 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
• 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 transpositional structures

COURSE CONTENT

Compositional structural styles and their plate-tectonic habitats • Wrench assembly • Transpositional 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 plays • Inversion • Structural validation criteria • Selecting the best balancing and restoration technique • Flexural-slip restoration • Area-depth technique for section validation, depth to detachment, bed-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 liberation of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow deposition and process including many case studies of reservoir architecture and sand-body quality and distribution with an introduction to new concepts, ideas, and methods in turbidite reservoir geology. Participants will be introduced to the limitations of conventional models for turbidite reservoirs and taught how to build enhanced predictive models using a combination of subsurface, outcrop, and modern sea-floor data. Through practical exercises and discussions, participants will experience the relative importance of a broad range of subsurface data. 3D seismic data from a range of locations will illustrate the quality and level of reservoir resolution possible when using modern data. Modern sea floor data from several turbidite basins will be available and participants will receive instruction on interpretation. Criteria for identification and interpretation of injected sandstones will be discussed.

DESIGNED FOR

Exploration and production geologists and geophysicists, stratigraphers, reservoir engineers, and petroleum geologists.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Review of turbidite settings, processes, models • Turbidite systems at outcrop • Rock analogs for the subsurface (including injected sands) • Modern deepwater systems • Alternative reservoir geometries • Seismic character of deepwater systems • Borehole/wellbore characteristics • Significance and use of various tools • Correlation of reservoir units • Predictive models for sand distribution • Critical data input to reservoir models • Definition of pay

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 genetic 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.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Geothermal 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 geothermal, geological, and engineering data. Geothermal 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: geothermal 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: geothermal allocation of commingled production costs only 1-5% as much as production logging. 3) They have applicability where other approaches do not. Example: geothermal 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 the utility of certain key software packages. Sampling pitfalls and sources of contamination are discussed. The course will NDT cover PVT (Pressure-Volume-Temperature) relationships or equation of state calculation.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

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Integrated Carbonate Reservoir Characterization – ICR
INTERMEDIATE 5-Day
This course will review the controls on carbonate reservoir heterogeneity from the pore architecture scale to the geometrical attributes at reservoir-scale and how these parameters can be incorporated and integrated into the development of viable petrophysically-based reservoir models for carbonates. In-class exercises are used to reinforce the potential integration of various data sets to provide students with experience in carbonate reservoir characterization.

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

YOU WILL LEARN HOW TO
• Integrate various aspects of carbonate rocks for improved carbonate reservoir architecture and flow unit characterization
• Apply knowledge of petrophysical, sedimentological petrologic tools to characterize and evaluate carbonate reservoirs
• Recognize and understand well log responses in carbonate systems and to learn how 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 seismic data in reservoir 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 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 areas: 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 progresses 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 Note. A basic knowledge of geology and/or petroleum geology is advisable if not required to fully appreciate the course contents.

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

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

COURSE CONTENT
Petroleum geology and its systems
• Operations geology: prospect to well planning, provision of geological services
• Website geology: geological sampling, sample analysis, and well stratigraphy, cutting, and core description
• Structural geology: fractures, faults, borehole geology
• Drilling Operations: bits, fluids, casing and cement, drilling problems and well control, directional drilling, geosteering
• Logging operations: acquisition, tools, quick look interpretation, MWD/LWD, geosteering
• Well testing and fluids: reservoir properties, rock and fluid interaction, permeability, averaging, data gathering and interpretation
• Impact on FDP: case histories
• Tending and contracting
• Reporting: geological data, petrophysical data, pressure data
• Exercises: 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 most quantitative, probabilistic play and prospect assessment procedures that are consistent and repeatable allowing for direct comparisons play to play or prospect to prospect. Basic and advanced 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 projects
• Determine prospect resource volume estimates
• Assess resource distribution in a play
• Understand the differences between stochastic and probabilistic estimates and have the knowledge to know when to use one or the other
• Predict the number and size distribution of potential future fields in a play
• Describe and calibrate risks associated with discovering a successful play

COURSE CONTENT
Geological controls of oil and gas occurrence
• Review of common assessment methods
• Application of volumetric prospect assessments: techniques, comparative data, and graphs to estimate input factors, such as trap volume, porosity, net/gross saturation, hydrocarbon fill fraction, formation volume factors, and recovery efficiencies
• Probability methods
• Risk analysis
• Hydrocarbon charge assessment: procedures for estimating possible amounts of oil and gas generated, migrated, and trapped in prospects
• Prospect assessment workshops
• 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 subduction, 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 specific geological inputs

Naturally Fractured Reservoirs: Geologic and Engineering Analysis – FR
SPECIALIZED 5-Day
This course covers geologic and engineering concepts, methodology, and technology used to characterize, evaluate, and manage naturally-fractured reservoirs. Applications and limitations of geologic and engineering procedures and tools are discussed. Field examples and case studies demonstrate the importance of integrated geologic and engineering studies in developing effective, economical reservoir management strategies for different types of reservoirs.

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

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

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

2020 Schedule and Tuition (USD)
HOUSTON, US 15-19 JUNE $4600
LONDON, UK 9-13 NOV $5405+VAT

2020 Schedule and Tuition (USD)
HOUSTON, US 10-14 AUG $4510
KUALA LUMPUR, MYS 7-11 DEC $4525

2020 Schedule and Tuition (USD)
HOUSTON, US 15-19 APR $4600
KUALA LUMPUR, MYS 28 SEP-2 OCT $5235+VAT
LONDON, UK 13-17 JULY $4610

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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 – SII1, 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:

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Peter Bartok</td>
<td>Basic Geophysics</td>
</tr>
<tr>
<td>Mr. Bob Brune</td>
<td>Basic Geophysics</td>
</tr>
<tr>
<td>Dr. Michael Burianyk</td>
<td>Basic Geophysics</td>
</tr>
<tr>
<td>Mr. Satinder Chopra</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Mr. John Logel</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Dr. Walter Lynn</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Dr. David Muerdter</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Mr. Marco Perez</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Dr. John Pigott</td>
<td>Seismic Interpretation – SII1</td>
</tr>
<tr>
<td>Dr. Tom Temples</td>
<td>Seismic Interpretation – SII1</td>
</tr>
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### Geophysics Course Progression Matrix

<table>
<thead>
<tr>
<th>Foundation</th>
<th>Intermediate</th>
<th>Specialized</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td><strong>Advanced</strong></td>
<td><strong>Specialized</strong></td>
</tr>
<tr>
<td>Basic Geology (Page 8)</td>
<td>Advanced Practices in Exploration and Development of Unconventional Resources (Page 16)</td>
<td>Geophysical and Geochemical Techniques of Heavy Oil Reservoirs (Page 10)</td>
</tr>
<tr>
<td>Geological and Geophysical Characterization of Heavy Oil Reservoirs (Page 10)</td>
<td>3D Seismic Attributes for Reservoir Characterization (Page 7)</td>
<td></td>
</tr>
</tbody>
</table>
Basic Geophysics – BGP

BASIC

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.

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

COURSE CONTENT
• The nature of seismic data
• What is wave propagation
• What causes seismic reflections and how they relate to rock properties including pore filling material
• The workflow in the seismic data and its limit of resolution
• Seismic velocities as they relate to rock properties and the imaging process
• The relationship between seismic velocities and pore pressure
• The change in velocity in a multilayered earth
• Pore pressure prediction
• Seismic data processing and 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

Seismic Imaging of Subsurface Geology – SSD

FOUNDATION

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 and appreciate the velocity model and the seismic images and will be able to recognize possible problems introduced or not mitigated by the processing flow. Moreover, 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.

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 and examine 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-Q filtering, and spectral whitening • Velocity estimation, velocity field building, and velocity uncertainty implications • Near-surface problems and solutions: seismic datums and statics corrections • Noise identification and suppression: coherent noises, multiples, linear noises, and incoherent noises • Advanced seismic imaging techniques: prestack time and pre-stack depth migration • Migration velocity analysis techniques

Seismic Velocities and Depth Conversion – SVDC

FOUNDATION

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 qualify control (QC) and calibrate newer PSDM data. Also, here in this class are when to reprocess the data and how to communicate with the processor in order to produce the best velocity model and depth image.

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. This is a foundation level course. It is neither designed nor paced for the experienced velocity modeler or processor.

YOU WILL LEARN HOW TO
• Understand the various types of velocities, their calculation, and the validity of their interpolation 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
• Use the model to convert horizons, faults, and seismic data from time to depth
• Understand at 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 velocity including average, interval, RMS, stacking, migration, P-wave, S-wave • Velocity Inputs: accuracy and regional extent of each, including shot shots, VSPs, sonic logs, time/depth functions, well picks and pseudo velocities, seismic velocities, and horizons for structural control • Synthetic Seismograms: creation, upscaling, and tie to seismic data • Advanced synthetics including synthetic gather creation • Zoeppritz equations, AIP, and AVO • Matching Synthetics to Seismic: calibrating the seismic data to the well data • Seismic 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 mapping, migration, and uncertainty • Introduction to Advanced Topics: anisotropy, pore-pressure prediction, geostatistics, and forward modeling

PETROSKILLS.COM/BLENDED-BGP

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

4 MAY-26 JUNE 2020 US$4325
21 SEP-13 NOV 2020 US$4325

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Seismic Positioning Data Management – SPDM

FOUNDERATION 2-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Seismic navigation data principles • Basic 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 Licensing • Acquisition • Storage • Import and quality assessment • Formats and conversions • Best practices

Advanced Practices in Exploration and Development of Unconventional Resources – EDUR

INTERMEDIATE 5-Day

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 anoia 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 pressures, properties, pressure, seal capacity, etc. • Using global and regional stress maps • Application of the Mohr circle • Determination of frac gradients • Leak-Off Test (Minifract) and microseismic • Water disposal and aquifer contamination • Economic evaluation of unconventional reserves • 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 look at the seismic image as being truly representative of both the rock properties and the pore filling material. This course is intended to provide the users with a clear and useable understanding of the current state of these technologies. The focus of the course is on both understanding and application. Exercises: Each topic in the course outline is reinforced by an exercise that gives the participants many practical and simple methods of integrating the course material into their everyday work.

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

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

INTERMEDIATE 5-Day

One of the most revolutionary, most effective, yet most under-utilized tools introduced into exploration this century is that of seismic stratigraphy. It is not a tool exclusive to geophysicists, nor is it a tool only for geologists. Seismic stratigraphic techniques are based upon an integration of firm, well-established geological and geophysical fundamentals. When properly applied, seismic stratigraphy provides a powerful foundation for reservoir architecture and helping describe a basin’s evolution and the resulting effects upon its spatial and temporal variation in hydrocarbon potential. Seismic stratigraphy chronostatigraphically constrains both the source for its petroleum and fault-mechanical stratigraphy of a basin. Furthermore, it can provide a predictive model extrapolated beyond the borehole as 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 for potential oil fields throughout 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
• Understand the premises behind the Vail seismic sequence paradigm
• Construct and interpret chronostatigraphic charts, sea level curves, and seismic facies maps
• Interpret elastic and cationic depositional systems responses for cyclic and autocyclic processes and the effects upon reservoir architecture and seal potential
• Systematically reconstruct a basin’s geohistory which provides the critical foundation for its petroleum and fault-mechanical exploration

COURSE CONTENT

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

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<th>Location</th>
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<tr>
<td>DENVER, US</td>
<td>27 APR-1 MAY</td>
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<tr>
<td>HOUSTON, US</td>
<td>19-23 OCT</td>
<td>$4910</td>
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</table>

2020 Schedule and Tuition (USD)

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COASTAL CARIBBEAN 5-Day

GEOPHYSICS16

Water disposal and aquifer contamination • 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

COURSE CONTENT

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

2020 Schedule and Tuition (USD)

HOUSTON, US 30 MAR-3 APR $4510

KUALA LUMPUR, MYS 22-26 JUNE $5525

HOUSTON, US 19-23 OCT $4610

LONDON, UK 27-31 JULY $5335+VAT

HOUSTON, US 27-31 AUG $4510

2020 Schedule and Tuition (USD)

CALGARY, CAN 7-11 DEC $4555+GST

HOUSTON, US 19-23 OCT $4610

KUALA LUMPUR, MYS 22-26 JUNE $5335+VAT

LONDON, UK 27-31 JULY $5335+VAT
**3D Seismic Attributes for Reservoir Characterization – SARC**

**SPECIALIZED 5-Day**

The primary objective of this course is to gain an intuitive understanding of the kinds of seismic features that can be identified by 3D seismic attributes, the sensitivity of seismic attributes to seismic acquisition and processing, and how independent seismic attributes are coupled through geology. We will also discuss alternative workflows using seismic attributes for reservoir characterization as implemented by modern commercial software and practiced by interpretation service companies. Participant discussion centered around case studies, attribute recipes for particular objectives, reservoir workflows and seismic attribute jeopardy exercises will be the main focus of the course.

**DESIGNED FOR**

Seismic interpreters, processors, stratigraphers and structural geologists, reservoir engineers, and students of geophysics.

**YOU WILL LEARN HOW TO**

- Use attributes to enhance subtle faults and folds, as lithologic indicators, and quality control the choice of processing parameters
- Evaluate and exploit attribute expressions for different depositional environments to better characterize reservoirs by adopting appropriate workflows and multi-attribute tools
- Identify geological features highlighted by attributes, limitations to seismic processing through attributes that may result in smeared attribute images from multi-azimuth and multi-offset data, limits of attribute analysis on data that have been poorly imaged and good and bad color display practices

**COURSE CONTENT**

Types of attributes • Impact of seismic data quality on seismic attributes • Methods for preconditioning of seismic data • Introduction of various algorithms for attribute computation, their limitations and performance strengths • Attribute expression of structure and stratigraphy in terms of facies and diapirism, clastic and carbonate depositional systems and geologic hazards • Multi-attribute analysis tools • Reservoir characterization workflows • Physical demonstration of attributes on real seismic data

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

**SPECIALIZED 5-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 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 with well data selected from around the world. 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 A/V)
- Understand the strengths and weaknesses of geovisualization and using syntheses, seismic inversion, and VSP
- Determine fault mechanical stratigraphy through proper interpretation of fault imaging
- Understand the differences, weaknesses, and strengths of both the Vail with the Galloway sequence paradigms and when to optimally employ them
- Develop sea level curves from micropalaeontology
- Construct detailed seismic facies maps and understand their relationship to Walter’s law
- Classify deltas based upon their seismic characteristics
- Differentiate basin floor fan facies and parasequence sets
- Interpret clastic and carbonate depositional system responses to allogenic and autochthonous processes and the effects upon reservoir architecture and seal potential
- Optimally interpret parasequence set fairways for exploration
- Geophysically characterize reservoirs for optimizing development

**COURSE CONTENT**

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

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**Applied Seismic Anisotropy for Fractured Reservoir Characterization – ASAF**

**SPECIALIZED 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 stressing 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 anisotopic data provide. The class is usually designed as lectures in the morning, with field-data analysis in the afternoon. 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**

Working, interpretation geophysicists and other geoscientists assigned to evaluate fractured reservoirs or reservoirs requiring hydrofracturing 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; quality-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 3D.
- Use anisotropy for your benefit. Classic analysis of azimuthal anisotropy requires seismic reflectors, that is, your reservoir must be within a sedimentary rock sequence. If your reservoir is in fractured basement rocks, you will learn practical techniques to evaluate the reservoir and guide the drilling program.
- Bring your properly acquired and recorded dataset(s) - they could demonstrate the principals of the morning lectures.

**COURSE CONTENT**

Fundamentals of reflection seismology; seismic anisotropy - its causes and uses • Issues, goals, and pitfalls in seismic full azimuth acquisition • Seismic data processing - nonazimuthal and azimuthal • Interpretation of azimuthal interval velocities and azimuthal amplitudes for in-situ stress and natural fractures; evaluation • Fundamentals of seismic modeling for anisotropy, especially common assumptions in different modeling packages • Microseismic: opening statements and discussion, historical background, Yeoman science 101 • Hydraulic fracture technology, in-situ and other studies of hydraulic fracture geometries • Earthquake seismology and hydraulic-fracture-induced microseismology • The means and the methods of microseismic imaging • Examples I: results - the dots • Examples II: interpretation and integration • Pitfalls, benefits, FAQs • Wrap-up discussion

---

**Use of Full Azimuth Seismic Anisotropy for Unconventional Plays – FAMS**

**SPECIALIZED 5-Day**

For surface seismic, participants will learn to evaluate azimuthal seismic in fractured reservoirs or resource intervals needing hydrofracturing. The course presents reflection seismic processing, acquisition design, processing, interpretation, and integrating support data narrow-azimuth seismic, well logs, production tests, VSPs, and core work. For microseismic, participants will learn the strengths, weaknesses, limitations, and benefits of microseismic imaging of hydraulic fractures.

**DESIGNED FOR**

For surface seismic, experienced geoscientists working seismic to evaluate unconventional resources, and/or fractured reservoirs that require hydraulic stimulation. For microseismic, all professionals using microseismicity to plan, monitor, evaluate, and diagnose stimulations will find this course useful.

**YOU WILL LEARN HOW TO**

- Specify what geophysical and engineering questions need to be asked about your reservoir and your play
- Specify the geophysical data that need to be acquired; design acquisition; specify the processing sequence
- Interpret the final processed data and test different interpretations
- Identify the support data required for the successful fracture and in-situ horizontal stress characterization
- Extract engineering benefits and meaning from microseismic data
- Appraise the utilities, capabilities, and limitations of microseismic imaging
- Develop insights and fundamental questions for microseismic projects
- Identify the support data needed to give a complete picture of the results
- Weigh field deployment options • Assess stimulation designs

**COURSE CONTENT**

Fundamentals of reflection seismology; seismic anisotropy - its causes and uses • Issues, goals, and pitfalls in seismic full azimuth acquisition • Seismic data processing - nonazimuthal and azimuthal • Interpretation of azimuthal interval velocities and azimuthal amplitudes for in-site stress and natural fractures; evaluation • Fundamentals of seismic modeling for anisotropy, especially common assumptions in different modeling packages • Microseismic: opening statements and discussion, historical background, Yeoman science 101 • Hydraulic fracture technology, In-situ and other studies of hydraulic fracture geometries • Earthquake seismology and hydraulic-fracture-induced microseismology • The means and the methods of microseismic imaging • Examples I: results - the dots • Examples II: interpretation and integration • Pitfalls, benefits, FAQs • Wrap-up discussion

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Well Construction / Drilling
Course Progression Matrix

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 and 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 Arko
- Mr. George Armitstead
- Mr. James Bond
- Mr. Richard Carden
- Mr. Kevin Cotter
- Mr. Mark Dauk
- Mr. Aaron Klein
- Mr. Steve McIvy
- Mr. Hecton Moreno
- Dr. Don Schmidt
- Mr. Subhash Shah
- Mr. Bob Weltsmear
- Mr. Larry Wolfson
- Mr. Mark Hackler
- Mr. Kevin Cuyler
- Mr. Richard Carden
- Mr. Steve Metcalf
- Mr. Aaron Klein
- Dr. Subhash Shah
- Dr. Don Schmidt
- Mr. Larry Wolfson
- Mr. Mark Hackler
- Mr. Kevin Cuyler
- Mr. Richard Carden
- Mr. Steve Metcalf
- Mr. Aaron Klein
- Dr. Subhash Shah
- Dr. Don Schmidt
- Mr. Larry Wolfson

### Basic Petroleum Technology Principles (Page 5) (Virtual/Blended Course)

- Basic Petroleum Technology (Page 5)
- Basic Petroleum Economics (Page 51)
- Basic Petroleum Technology (Page 5)
- Basic Petroleum Economics (Page 51)
- Basic Petroleum Technology Principles (Page 5) (Virtual/Blended Course)
- Basic Petroleum Economics (Page 51)

### Basics of Petroleum Engineering (Page 5) (Virtual/Blended Course)

- Basic Petroleum Technology (Page 5)
- Basic Petroleum Economics (Page 51)
- Basic Petroleum Technology Principles (Page 5) (Virtual/Blended Course)
- Basic Petroleum Economics (Page 51)

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<tr>
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<th>Petroleum Business and Professional Development</th>
<th>Well Construction / Drilling</th>
<th>Health, Safety, Environment</th>
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<tr>
<td>G&amp;G Petrophysics / Geoscientist</td>
<td>COMPLETING-AND WORKOVER OPERATIONS</td>
<td>WELL DESIGN / PLANNING</td>
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<tr>
<td>COMPLETING-AND WORKOVER OPERATIONS</td>
<td>MANAGING WELL_SITE OPERATIONS</td>
<td>MANAGING WELL_SITE OPERATIONS</td>
<td>_story lines</td>
</tr>
<tr>
<td>- Applied Rock Mechanics (Page 27)</td>
<td>- Conching Practices - Conching II (Page 21)</td>
<td>- Drill String Design and Optimization (Page 22)</td>
<td>_story lines</td>
</tr>
<tr>
<td>- Drilling Fluids Technology (Page 19)</td>
<td>- Managing Wells Completion and Stimulation (Page 45)</td>
<td>- Drill String Design and Optimization (Page 22)</td>
<td>_story lines</td>
</tr>
<tr>
<td>- Drilling Fluids Technology (Page 19)</td>
<td>- Managing Wells Completion and Stimulation (Page 45)</td>
<td>- Drill String Design and Optimization (Page 22)</td>
<td>_story lines</td>
</tr>
</tbody>
</table>

### 2020 Schedule and Tuition (USD)

- **BASIC 5-Day FIELD TRIP**
  - London, UK: 14-18 Sep, $5135+VAT
  - Houston, US: 20-24 Apr, $4855

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For other courses, see the WebSite.
Casing and Cementing — CAC

BASIC 5-Day

This course builds a firm foundation in the principles and practices of designing, planning, and constructing 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 plugging 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 calculations • Cementing equipment • Well head equipment

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 presents 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
Drilling 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 operations
• 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
• Compile 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 LAB VISIT

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 drilling fluid 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, tool pushers, 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 • Select 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

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Start Date</th>
<th>End Date</th>
<th>Duration</th>
<th>Tuition</th>
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<tbody>
<tr>
<td>ABERDEEN, UK</td>
<td>26-30 OCT</td>
<td>2-1 NOV</td>
<td>7 Days</td>
<td>£5385+VAT</td>
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<tr>
<td>DUBAI, UAE</td>
<td>3-14 AUG</td>
<td>6-17 SEP</td>
<td>5 Days</td>
<td>$4585</td>
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</tbody>
</table>

Any course is available in-house at your location. Contact us today.

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Casing Design Workshop – CDW

PetroSkills PetroAcademy

COURSE DESCRIPTION

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 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.

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

BLENDED LEARNING WORKSHOP STRUCTURE

<table>
<thead>
<tr>
<th>Week</th>
<th>Hours (Approx)</th>
<th>Subject</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Opening Session: Overview</td>
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<tr>
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<td>Introduction to Casing Design</td>
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<td>Select Casing Depth and Sizes</td>
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<tr>
<td>2</td>
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<td>Select Casing Depth and Sizes</td>
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<tr>
<td>3</td>
<td>1</td>
<td>Calculate Collapse and Burst Loads</td>
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<tr>
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<td>3</td>
<td>Casing Load Determination</td>
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<tr>
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<td>3</td>
<td>Make Preliminary Casing Selection, Adjust for Axial Loads</td>
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<tr>
<td>3</td>
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<td>Make Preliminary Casing Selection, Adjust for Axial Loads</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Casing Selection for Collapse, Burst, and Axial Design</td>
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<td>4</td>
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<td>Calculate Combined Load Effects, Adjust and Make Final Selection</td>
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<td>Calculate Combined Load Effects, Adjust and Make Final Selection</td>
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<tr>
<td>5</td>
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<td>Workshop Wrap-up</td>
</tr>
</tbody>
</table>

TO LEARN MORE, VISIT
PETROSKILLS.COM/CASING-DESIGN-WORKSHOP

2020 Schedule and Tuition (USD)
HOUSTON, US 17-21 AUG $4410

Virtual Schedule and Tuition (USD)
27 OCT-19 NOV 2020 US$3885

* plus computer charge

See website for dates and locations.
LAB VISIT

Cementing is a key factor in the well construction plan. The base cement used in the designing of cement slurries may or may not be API class cement. The operating company and the service company personnel should have a good working knowledge of cement slurry design, cement additives, and placement procedures. The majority of the operating companies do not have cement testing laboratories, therefore, the laboratory testing is conducted by service companies. This course is designed to give a good understanding of how the cement slurries are tested and under what conditions depending on given well parameters. This course will also cover casing hardware (both internal and external), cement blending, cement additive blending (dry and/or liquid), on-site mixing equipment and job execution on location.

**DESIGNED FOR**

Operating and service company personnel responsible for planning, designing, laboratory testing, overseeing, and executing cementing operations.

**YOU WILL LEARN HOW TO**

- Design cement slurries using API and/or field adapted procedures and laboratory testing procedures
- Use cement additives in designing cement slurries to improve job success and/or reduce overall job costs
- Design cement jobs to include casing, multi-stage, liner, and tie-back strings
- Design and perform remedial (squeeze) cement jobs to include selection of tools
- Design cement plug slurries and selection of tools to improve overall job success

**COURSE CONTENT**

- Basic cements
- Cement additives
- Laboratory testing
- Casing hardware
- Blending equipment
- Mixing equipment
- Primary cementing
- Remedial cementing
- Plug cementing

**FOUNDATION 4-Day**

LAB VISIT

Cementing II

Cementing Practices –

Cementing II – CEP

**INTERMEDIATE 5-Day**

LAB VISIT

Cementing is a very important phase of the well construction plan. Operating company personnel must have a good working knowledge of cements, cementing additives, and placement procedures. The use of temperature modeling, computer programs used for job design, and placement of the cement has caused some operating companies to retain a cement service company representative on a full-time basis to assist in the overall cementing operations. The operator is critical to the success of the job. This course covers the importance of the cement sheath integrity during the life of the well, which will require additional mechanical properties of the cement sheath than just the unconfined compressive strength in many cases. The parameters that the cement sheath will be subjected to must be considered. There are a number of joint industry projects addressing this area of work. The course covers the use of cement formulations, cement additives, casing hardware, cement blending, on-site mixing equipment, and a well-planned job procedure. Cementing guidelines that aid in overall job performance will be covered.

**DESIGNED FOR**

Operating company and service company personnel responsible for planning, overseeing, and executing cementing operations.

**YOU WILL LEARN HOW TO**

- Use cementing additives properly to improve and reduce job costs
- Interpret laboratory test results
- Perform primary cementing operations to include: casing cementing, liner cementing, multi-stage cementing
- Conduct squeeze job selections and selection of squeeze tools
- Perform cement plug operations to improve overall job success
- Interpret cement sheath evaluation logs

**COURSE CONTENT**

- The overall cementing operation
- Primary cementing
- Remedial cementing
- Plug cementing
- The use of cement additives
- Laboratory testing
- Casing hardware
- Cement sheath integrity
- Cement sheath evaluation
- Mixing equipment
- Special cement systems
- Cement guidelines
- Current documents

**2020 Schedule and Tuition (USD)**

- **DENVER, US** 2020 Schedule and Tuition (USD)
  - 28-31 JULY $4135
  - 14-17 SEP $4145
- **HOUSTON, US** 2020 Schedule and Tuition (USD)
  - 8-10 JUNE $3310

Any course is available in-house at your location. Contact us today.
Deepwater Well Engineering – DWE

INTERMEDIATE 5-Day
This is a five-day course designed to promote understanding of well design and engineering capabilities unique to the deep water environment. Participants are actively engaged in the skills and activities required to deliver a cost-effective well plan, while also gaining valuable perspective on the role of a DW drilling engineer as a project manager. Suggested course prerequisites include 5+ years’ experience in drilling and 2+ years in a well planning role for onshore or shallow water applications.

DESIGNED FOR
Experienced drilling engineers, drilling supervisors, and other petroleum professionals that are new to deep water (DW) who will become involved or responsible for DW well planning or oversight of non-operated DW wells. The ten day, Well Design and Engineering (WDE) course, or its equivalent, is highly recommended as a pre-requisite.

YOU WILL LEARN HOW TO
• Understand and manage technologies, practices, and design methodologies unique to the DW environment
• Analyze and utilize offset well data important for DW planning and well design
• Identify key issues and risks related to floating operations and rig selection
• Manage challenging logistics and unique equipment/supply chain issues
• Clarify the potential impact of geohazards, such as shallow gas and water flows, hydrates, salt, and tar
• Identify well control constraints and calculate fail tolerance
• Develop specific casing design skills, including impact of metocean environmental conditions on structural pipe design, casing point selection, annular pressure buildup design strategies, and use of US COM Well Containment Screening Tool
• Assess DW cementing technologies and make appropriate choices for a DW well
• Develop designs for DW drill strings, BHAs, and landing strings
• Clarify well design issues for both riserless and post-riser phases of well construction
• Define drilling fluids for a DW well, assess and address any unique issues
• Compile risks to well delivery; develop mitigations and contingency plans
• Consider abandonment requirements in well design

COURSE CONTENT
• Floating drilling rigs and equipment • Unique challenges of deepwater • Shallow hazards • Deepwater planning cycle • Subsea BOP equipment • Subsea well control issues • Structural pipe design for bending • Riserless drilling • Casing shoe depth considerations in DW • Annular pressure buildup in casing strings • Regulatory requirements • Subsea cementing process • Subsea wellheads and trees • Hydrates • Drilling fluid issues in DW • Slip crushing for drillstring design • Landing string design • Salt drilling • Relief well planning for DW • DW risks • Abandonment of subsea wells • Awareness of the basics of Managed Pressure • Drilling and other emerging technologies

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 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
• Conduct vertical-horizontal drilling
• 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-laterals • 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 DS-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

Managing Wellsite Operations is an interactive course that teaches participants to successfully manage wellsite operational plans, resource management, and control measures. Interpersonal skills associated with the art of managing the Johari 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 action planning, rig instructions, and work processes is exercised to improve operator, contractor, and service provider performance metrics.

DESIGNED FOR
Drilling and completion well supervisors, wellsite engineers, superintendents, operations managers, senior drilling contractor, and wellsite service personnel.

YOU WILL LEARN HOW TO
• Manage key relationships between surface – subsurface parts of the well program
• Manage technical and interpersonal skills associated with complex operations
• Manage self and rig team situational awareness and competences
• 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 wellsite challenges, distractions, and sensibilities • 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

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
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</thead>
<tbody>
<tr>
<td>HOUSTON, US</td>
<td>11-15 MAY</td>
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<tr>
<td>OKLAHOMA CITY, US</td>
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<tr>
<td>KUALA LUMPUR, MYS</td>
<td>12-16 OCT</td>
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<tr>
<td>HOUSTON, US</td>
<td>24-28 AUG</td>
<td>$4510</td>
</tr>
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</table>
**PetroSkills delivers the knowledge and skills required for unconventional resource plays.**

**COURSE PROGRESSION MATRIX**

<table>
<thead>
<tr>
<th>BASIC</th>
<th>FOUNDATION</th>
<th>INTERMEDIATE</th>
<th>SPECIALIZED</th>
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<tr>
<td><strong>GEOPHYSICS AND GEOLOGY</strong></td>
<td><strong>PETROPHYSICS</strong></td>
<td><strong>RESERVOIR ENGINEERING</strong></td>
<td><strong>WELL CONSTRUCTION / DRILLING</strong></td>
</tr>
<tr>
<td><strong>USE OF FULL AZIMUTH SEISMIC AND MICROSEISMIC FOR UNCONVENTIONAL PLAYS - FAMS</strong></td>
<td><strong>APPLIED ROCK MECHANICS - ARM</strong></td>
<td><strong>HORIZONTAL AND MULTILATERAL WELLS: ANALYSIS AND DESIGN - HML1</strong></td>
<td><strong>COALBED METHANE RESERVOIRS - CMR</strong></td>
</tr>
<tr>
<td><strong>BASIN ANALYSIS WORKSHOP: AN INTEGRATED APPROACH TO THE EXPLORATION AND EVALUATION OF CONVENTIONAL AND UNCONVENTIONAL RESOURCES - BA</strong></td>
<td><strong>PETROPHYSICS OF UNCONVENTIONAL RESERVOIRS - PUR</strong></td>
<td><strong>RESERVOIR MANAGEMENT FOR UNCONVENTIONAL RESERVOIRS - RMUR</strong></td>
<td><strong>DIRECTIONAL, HORIZONTAL, AND MULTILATERAL DRILLING - DHMD</strong></td>
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<tr>
<td><strong>ADVANCED PRACTICES IN EXPLORATION AND DEVELOPMENT OF UNCONVENTIONAL RESERVOIRS - EPUR</strong></td>
<td></td>
<td><strong>COMPLETIONS AND WORKOVERS - CW</strong></td>
<td><strong>WELL DESIGN AND ENGINEERING - WDE</strong></td>
</tr>
<tr>
<td><strong>INTRODUCTION TO FIBER OPTICS FOR WELL SURVEILLANCE - FOS</strong></td>
<td></td>
<td><strong>UNCONVENTIONAL RESOURCES COMPLETION AND STIMULATION - UCS</strong></td>
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<tr>
<td><strong>INTRODUCTION TO GEOMECHANICS FOR UNCONVENTIONAL RESERVOIRS - GUR</strong></td>
<td><strong>FACILITIES, PROJECT AND BUSINESS</strong></td>
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</tr>
<tr>
<td><strong>PETROLEUM SYSTEMS ANALYSIS - PSA</strong></td>
<td><strong>FOUNDATIONS OF PETROPHYSICS - PPP</strong></td>
<td><strong>WELL TEST DESIGN AND ANALYSIS - WTA</strong></td>
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<tr>
<td><strong>OPERATIONS AND DEVELOPMENT OF SURFACE PRODUCTION SYSTEMS - OS</strong></td>
<td></td>
<td><strong>PRODUCTION OPERATIONS 2 - PO2</strong></td>
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<tr>
<td><strong>Petroleum Systems Analysis - PSA</strong></td>
<td><strong>Well Test Design and Analysis - WTA</strong></td>
<td><strong>Well Design and Engineering - WDE</strong></td>
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<td><strong>OPERATIONS AND DEVELOPMENT OF SURFACE PRODUCTION SYSTEMS - ODS</strong></td>
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<tr>
<td><strong>EVALUATING AND DEVELOPING SHALE RESOURCES - SRE</strong></td>
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**PETROSKILLS UNCONVENTIONAL RESOURCE COURSES:**

- Advanced Hydraulic Fracturing
- Advanced Practices in Exploration and Development of Unconventional Reservoirs
- Applied Rock Mechanics
- Artificial Lift for Unconventional Wells
- Basic Petroleum Engineering Practices
- Basic Petroleum Technology
- Basin Analysis Workshop: An Integrated Approach to the Exploration and Evaluation of Conventional and Unconventional Resources
- Coalbed Methane Reservoirs
- Completions and Workovers
- Directional, Horizontal, and Multilateral Drilling
- Evaluating and Developing Shale Resources
- Foundations of Petrophysics
- Gas Production Engineering
- Horizontal and Multilateral Wells: Analysis and Design
- Horizontal and Multilateral Wells: Completions and Stimulation
- Hydraulic Fracturing Applications
- Introduction to Fiber Optics for Well Surveillance
- Introduction to Geomechanics for Unconventional Reservoirs
- Managing Non-Technical Risks
- Oil Well Pad Facilities (for Facilities Engineers)
- Oil Well Pad Facilities (for Non-Facilities Engineers)
- Onshore Gas Gathering Systems: Design & Operations
- Operations and Development of Surface Production Systems
- Petroleum Systems Analysis
- Petrophysics of Unconventional Reservoirs
- Production Operations 1
- Project Management in Upstream Field Development
- Reservoir Management for Unconventional Reservoirs
- Unconventional Resource and Reserve Evaluations
- Unconventional Reservoirs Characterization and Stimulation
- Use of Full Azimuth Seismic and Microseismic for Unconventional Plays
- Well Test Design and Analysis
- Well Design and Engineering

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 protocols, 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.

[www.petroskills.com/unconventional](http://www.petroskills.com/unconventional)

email unconventional@petroskills.com
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 a new course, **Introduction to Fiber Optics for Well Surveillance – IFOS** on page 26.

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

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<thead>
<tr>
<th>Geology and Geophysics</th>
<th>Petrophysics</th>
<th>Reservoir Engineering</th>
<th>Production and Drilling</th>
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<tr>
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<td><strong>BASELINE</strong></td>
<td><strong>APPLIED</strong></td>
<td><strong>ROCK MECHANICS</strong></td>
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<td>Petrophysical Data Acquisition</td>
<td>Open Hole Interpretaion</td>
<td>Data Integration and Trends Analysis</td>
<td>Naturally Fractured Reservoirs</td>
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<td>Core Analysis, Acquisition</td>
<td>Core Analysis, Interpretation</td>
<td>Core Analysis, Evaluation</td>
<td>Core Analysis, Evaluation</td>
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<tr>
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<td>Core Analysis, Evaluation</td>
<td>Well Log Interpretation</td>
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<tr>
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<td>MUD Logging</td>
<td>MUD Logging</td>
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<tr>
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<td>Foundations of Petrophysics</td>
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<tr>
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<td>Production Technology for Other Disciplines</td>
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<tr>
<td>Core Analysis, Evaluation</td>
<td>Basic Drilling, Completion, and Workover Operations</td>
<td>Basic Drilling, Completion, and Workover Operations</td>
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<tr>
<td>Core Analysis, Evaluation</td>
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<td>Basic Petroleum Technology Principles</td>
<td>Basic Petroleum Technology Principles</td>
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**Foundations of Petrophysics – FPP**

**FOUNDATION** 5-Day

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

Fundamental concepts of petrophysics • Depositional systems and petrophysical rock parameters • Nature of porosity and permeability • Basic rock properties; theory and quicklook techniques • Mud logging • 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.

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

**VIRTUAL DELIVERY $4325**

PETROSKILLS.COM/FPPONLINE

<table>
<thead>
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<th>2020 Schedule and Tuition (USD)</th>
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</thead>
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<tr>
<td>KUALA LUMPUR, MYS</td>
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<tr>
<td>LONDON, UK</td>
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<thead>
<tr>
<th>Course Progression Matrix</th>
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<tr>
<td><strong>Basic Petroleum Technology</strong></td>
<td><strong>Basic Geophysics</strong></td>
</tr>
<tr>
<td><strong>Foundations of Petrophysics</strong></td>
<td><strong>Basic Petroleum Geology</strong></td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td><strong>Intermediate</strong></td>
</tr>
<tr>
<td><strong>Specialized</strong></td>
<td><strong>Specialized</strong></td>
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</tbody>
</table>

Any course is available in-house at your location. Contact us today.

+1.918.828.2500  |  petroskills.com  |  +1.800.821.5933 (toll free North America)
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. Wherever possible, the physics of logging measurements is related to everyday tools and applications. Participants develop an appreciation for the constraints and limitations of operating in the borehole environment. A number of actual log examples are related to basic principles in the description of reservoir properties such as porosity, mineralogy, formation factor, saturation, and hydrocarbon type for essentially clean reservoirs. Cross-plotting and recognition techniques quickly and efficiently discriminate between water, oil, and gas. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

**YOU WILL LEARN HOW TO**

- Identify reservoirs
- Determine mineralogy, porosity, and saturation in various lithologies
- Recognize the importance of electrical properties of earth materials
- Highlight oil mobility
- Preserve core to minimize rock alteration
- Take and analyze sidewall cores
- Use cores to estimate porosity, permeability, and fluid saturation (basic core analysis)
- Understand special core analysis (e.g., wettability, relative permeability, capillary pressure, and reservoir fluid distribution for reservoir engineering and petrophysical evaluation)
- Prevent/spot errors in core analysis vendor reports (quality control)
- Select samples for special core studies
- Correlate core and log data

**COURSE CONTENT**

- Logging objectives • Invasion profile • Challenge of borehole geophysics
- Passive electrical properties of earth materials
- Resistivity measuring tools, normal, induction, laterolog • Reservoir/non-reservoir discrimination
- Matrix-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 crossplots and mineralogy identification
- Partially saturated rock properties and Archie Equation • Linear movable oil plume
- Geosteering • Geophysical logs
- Carbonate geology
- Petrophysical analysis
- Rock physics
- Project planning
- Core evaluation systems
- Core analysis
- Core handling, wellsite procedures, and preservation methods
- Wellbore and core analysis
- Organizing efficient laboratory programs
- Petrophysics of earth materials
- Electrical properties
- Wireline logging and well completion
- Reconciliation of laboratory analysis
- Reservoir simulation
- Final problem: design of reservoir fluid distribution
- Data integration in reservoir simulation

**YOU WILL LEARN HOW**

- Make well to well correlation
- Understand well drilling
- Understand mud logging equipment
- Calculate the lag time and advanced volumes calculation
- Perform 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
- ...and more...

**2020 Schedule and Tuition (USD)**

- **ABERDEEN, UK** 24-28 FEB $5165+VAT
- **DENVER, US** 31 AUG-4 SEP $4435
- **HOUSTON, US** 15-19 FEB $4440
- **KUALA LUMPUR, MYS** 1-5 AUG $4440
- **LONDON, UK** 9-13 NOV $5165+VAT
- **PERTH, AUSTRALIA** 21-25 SEP $5375+GST

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Coring and Core Analysis – CCA

**FOUNDATION 5-Day**

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

**Laboratory visit with core analysis measurement demos (where feasible).**

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

- Coring and core analysis objectives • Coring hardware and maximizing core recovery • Core-handling, wellsite procedures, and preservation methods • Sidewall coring and analysis • Organizing efficient laboratory programs • Petrophysics of earth materials • Electrical properties • Wireline logging and well completion • Petrophysics of earth materials
- Formation resistivity factor
- Conductivity of shales
- Core correlation (includes nmr log calibration, acoustic, nuclear, and electrical properties)
- Introduction to rock mechanics
- Core log correlation

**YOU WILL LEARN**

- The processes of multi-source data collection (from cores, logs, lab and field tests, drilling, seismic, microseismic, etc.) for characterization of rock properties and in-situ stresses and building Mechanical Earth Models (MEMs)
- To analyze and interpret the geomechanical aspects of image logs, minifract and OFT tests, and drilling and compaction reports
- To use different methodologies to measure/estimate in-situ stress components
- To apply geomechanical modeling to unconventional plays
- Practical approaches for drilling and mud window design
- The basic principles of hydraulic fracture design
- To characterize natural fractures and use discrete fracture network (DFN) modeling to account for their influence on hydraulic fracturing operations
- About modeling and monitoring of fault reactivation and seismicity induced by hydraulic fracturing and waste fluid disposal
- The application of data analytics and machine learning for optimization of drilling, completion, and production in unconventional plays

**COURSE CONTENT**

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

**2020 Schedule and Tuition (USD)**

- **HOUSTON, US** 28 SEP-2 OCT $4410

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Mud Logging – 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 well drilling
- Understand mud logging equipment
- Calculate the lag time and advanced volumes calculation
- Perform 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
- ...and more...

**2020 Schedule and Tuition (USD)**

- **HOUSTON, US** 14-18 SEP $4325+GST

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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, vertical logging and log analysis, coring and core analysis, petrophysics, geophysics, geostatistics, 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**

- 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
- ...and more...

**2020 Schedule and Tuition (USD)**

- **CALGARY, CAN** 14-16 SEP $3325+GST
- **HOUSTON, US** 6-8 JUL $3370
- **LONDON, UK** 7-9 DEC $3910+VAT
- **PITTSBURGH, US** 27-29 APR $3355

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Introduction to Geomechanics for Unconventional Reservoirs – IGUR

**FOUNDATION 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN**

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

**COURSE CONTENT**

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

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**2020 Schedule and Tuition (USD)**

- **CALGARY, CAN** 23-27 NOV $4335+GST
- **HOUSTON, US** 14-18 SEP $4410

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Any course is available in-house at your location. Contact us today.
Introduction to Fiber Optics for Well Surveillance – IFOS

FOUNdATION 3-Day

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

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

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Integration of Rocks, Log and Test Data – ILC

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Objectives of integration • Key rock properties for formation evaluation • Impact of depositional environment and rock properties • Petrophysical rock type • Texture, porosity, and permeability • Clay impact • Summary of basic logging tools • Subsurface rock sampling • Use of subsurface pressure data and evaluation • Relative permeability • Capillary pressure application to pay determination • Basic methodology for an integrated interpretation • Rock typing • Core analysis • Clastic and carbonate rock types • Important reservoir rock parameters • Cementation and saturation components • Total porosity to effective porosity

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Determine the nature, volume, and distribution of clay minerals and shales in shaly sands and their impact on the analyses of cores and logs
• Integrate petrographic, core, and log data to significantly improve reservoir evaluation in shaly sands and other rock types containing significant amounts of micropermeability
• Bring order out of chaos on porosity-permeability cross-plots using rock typing
• Evaluate effective and total porosity, fluid saturations, and productivity 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 shaly laminations and how they are distributed in shaly sands • Influence of clay minerals and shaly laminations on petrophysical properties • Occurrence of clay minerals and shaly laminations in reservoir rocks and relation to depositional environment and diagenesis • Integration of petrographic, core, and log data for evaluation of shaly sands • Effects of clay minerals and shaly 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, Watten-Smuits, Dual Water and Juhazh saturation methods • Prediction of permeability and productivity from logs in shaly sands: identification of bypassed pay • Use of advanced logs (NMR, BHI, Dipmeters) integration with core data for purposes of evaluation

Nuclear Magnetic Resonance (NMR) Petrophysics – NMRR

INTERMEDIATE 4-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

• Understand how NMR works for petrophysical applications
• Understand the language of NMR technology (mnemonics)
• Use NMR data for core and log applications
• Understand how NMR fits into predictive rock typing 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)
Dipemeters 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. Dipemeters and borehole images can be run in water-based or oil-based mud; on wireline or LWD. They are used structurally to detect, orient, and quantify natural and induced fractures, faults, fold axes, unconformities, and in situ stress. Stratigraphically, dipemeters and borehole images are used to identify paleocurrent directions, bounding surfaces, facies, thin beds, net-sand, and secondary porosity. The key objective of dipemeter 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 dipemeters and borehole-imaging logs and understand the physical principles behind them
- Detect and quantify faults and fractures, determine in situ stress orientations, and 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 dipemeters 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, scoured 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

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**Applied Rock Mechanics** — ARM

**SPECIALIZED**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

- Determine the stress, strain, and failure mechanics of rocks
- Apply rock mechanics concepts and generate economic benefits in all phases of reservoir development

**COURSE CONTENT**

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

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**Cased Hole Formation Evaluation** — CH

**SPECIALIZED**

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 wellbore and formation complexities. The user will gain a better understanding of why tools from different service companies, often recording similar raw data in near-identical conditions, may differ significantly in their predictions. The course will help users of the technology make targeted tool choices, plan logging jobs better, and perform in-house interpretation if needed.

**DESIGNED FOR**

Geologists, formation evaluations specialists, completions 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/O logging methods for saturation calculation, especially through complicated well bores and in complex formations
- Capture 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 logging in low and variable salinity conditions in water and steam floods where PNC methods do not work, and direct neutron (PNN) methods to Locate oil, gas/water, gas/steam, or steam/liquid contacts • Compute water, oil and gas/steam saturation (in steam floods), and residual saturation using log-inject-log methods • Application of open-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

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**Wireline Formation Testing and Interpretation** — WFT

**SPECIALIZED**

Formation testing and sampling tools (FTS) with wireline and while-drilling are widely used in exploration/appraisal and reservoir development projects. Over the past two decades, modern tools, such as MDT, PCI, RDT, 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 alternative 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. Designed to provide 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 works; configure tool strings and design plan a test program
- Perform QA/QC pressures and sampling data in real-time
- Interpret pressure gradient data for fluid densities and contact levels
- Understand reservoir connectivity/continuity and compartmentalization
- Quantify uncertainties of data interpretation results
- Interpret graphical techniques (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, PFL, and compositional gradient; excess pressure plot for compartmentalization; normalization plot for depleted reservoir • Multiple well pressure trends for reservoir compartmentalization and depletion, and extend • Qualification and quantification of interpretation uncertainties • Mud filtration phenomena dynamics; dynamic gradient; supercharging; wettability/capillarity 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 VI; practical aspects of well productivity and deliverability potential estimates

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**Schedule and Tuition (USD)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
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<td>Denver, US</td>
<td>28 Sep-2 Oct 7</td>
<td>$4202</td>
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<td>Houston, US</td>
<td>13-17 Apr</td>
<td>$4565</td>
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<td>Dubai, UAE</td>
<td>14-18 June</td>
<td>$5750+VAT</td>
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<tr>
<td>Houston, US</td>
<td>16-18 Nov</td>
<td>$4390</td>
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<tr>
<td>London, UK</td>
<td>24-28 Aug</td>
<td>$5355+VAT</td>
</tr>
<tr>
<td>Houston, US</td>
<td>12-15 Oct</td>
<td>$4130</td>
</tr>
<tr>
<td>Dubai, UAE</td>
<td>30 Mar-3 Apr</td>
<td>$5750+VAT</td>
</tr>
</tbody>
</table>

† includes field trip

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

**Basic Reservoir Engineering – BR** leads off the section as a perfect basic overview for anyone working with reservoir definition, development, or production. The next course, **Applied Reservoir Engineering – RE** on page 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. ROSARIO ARCHER
- DR. ASHUL BHAR
- DR. AKHIL DATTA-GUPTA
- DR. MODER DELSHAD
- DR. IGOR DIKHIN
- DR. CHRIS GALAS
- MR. CURTIS GOLKE
- MR. MASON GOMEZ
- DR. TON GRIMBERG
- DR. GREG HAIZETT
- MR. RICHARD HENRY
- DR. CHUN HUH
- DR. RUSSELL JOHNS
- DR. MOHAN KELKAR
- MR. STANLEY KLEINSTEINER
- DR. LARRY W. LAKE
- DR. KHOSROW MOWLA
- MR. DAVID PATRICK MURPHY
- DR. GRANT ROBERTSON
- MS. DEBORAH RYAN
- MR. RICHARD SCHROEDER
- MR. JOHN SEIDLE
- MR. ROD SEIDLE
- DR. JOHN SHIN
- DR. DAVE WAGNER

### Reservoir Engineering Course Progression Matrix

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<tr>
<td><strong>Geology and Geophysics</strong></td>
<td><strong>Petrophysics</strong></td>
<td><strong>Reservoir Engineering</strong></td>
<td><strong>Production and Drilling</strong></td>
<td><strong>Petroleum Business &amp; Professional Development</strong></td>
<td><strong>Health, Safety, Environment</strong></td>
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<tr>
<td><strong>MODELING AND SIMULATION</strong></td>
<td><strong>RESERVOIR CHARACTERIZATION AND TESTING</strong></td>
<td><strong>RESERVOIR MANAGEMENT, SURVEILLANCE, STIMULATION</strong></td>
<td><strong>DEVELOPMENT RESOURCES / FIELD DEVELOPMENT</strong></td>
<td><strong>EOR / WATERFLOODING</strong></td>
<td><strong>HORIZONTAL AND MULTILATERAL WELLS: ANALYSIS AND DESIGN</strong></td>
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<tr>
<td>Production Logging (PStart: 44)</td>
<td>Reservoir Modelling of Heavy Oil Resources (PStart: 33)</td>
<td>Integrated Reservoir Modelling (PStart: 32)</td>
<td>Chemical Enhanced Oil Recovery Fundamentals (PStart: 30)</td>
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<tr>
<td>Capillarity in Rocks (PStart: 31)</td>
<td>Reservoir Simulation Strategies (PStart: 33)</td>
<td>Reservoir Characterisation (PStart: 33)</td>
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<td>Petrophysics of Unconventional Reservoirs (PStart: 25)</td>
<td>Reservoir Management for Unconventional Reservoirs (PStart: 33)</td>
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<tr>
<td><strong>FIELD DEVELOPMENT</strong></td>
<td><strong>WATERFLOODING</strong></td>
<td><strong>EOR / WATERFLOODING</strong></td>
<td><strong>EOR / WATERFLOODING</strong></td>
<td><strong>EOR / WATERFLOODING</strong></td>
<td><strong>EOR / WATERFLOODING</strong></td>
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<tr>
<td>Production Operations 1 (PStart: 37)</td>
<td>Production Technology for Other Disciplines (PStart: 38)</td>
<td>Production Technology for Other Disciplines (PStart: 38)</td>
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<tr>
<td>EOR / WATERFLOODING (Also available as a Virtual/Blended Course)</td>
<td>EOR / WATERFLOODING (Also available as a Virtual/Blended Course)</td>
<td>EOR / WATERFLOODING (Also available as a Virtual/Blended Course)</td>
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</tbody>
</table>

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Basic Reservoir Engineering – BR

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

Applied Reservoir Engineering – RE

FOUNDATION 10-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

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

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
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<tr>
<td>ABERDEEN, UK</td>
<td>23-24 AUG</td>
<td>$8965+VAT</td>
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<td>CORK, IRL</td>
<td>1-2 SEP</td>
<td>$6720+VAT</td>
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<td>DUBLIN, IRL</td>
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<td>MUNSTER, IRL</td>
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<td>PARIS, FRA</td>
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<td>$9320</td>
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<tr>
<td>MILAN, ITA</td>
<td>26-27 OCT</td>
<td>$6720+VAT</td>
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<tr>
<td>BRUSSELS, BEL</td>
<td>1-2 NOV</td>
<td>$9320</td>
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<td>VIENNA, AUT</td>
<td>4-5 NOV</td>
<td>$6720+VAT</td>
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<tr>
<td>ZURICH, SUI</td>
<td>7-8 NOV</td>
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<td>LONDON, UK</td>
<td>10-11 NOV</td>
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<td>MILAN, ITA</td>
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<tr>
<td>BOREALIS, SLO</td>
<td>16-17 NOV</td>
<td>$6720+VAT</td>
</tr>
</tbody>
</table>

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

Applied Reservoir Engineering – BR/BLENDED

BLENDED LEARNING WORKSHOP STRUCTURE

- Virtual Instructor-led Training
- Online Learning Activity/Reading

WORKSHOP STRUCTURE

Week | Hours (Approx) | Subject
--- | -------------- | ------------
1   | 1.0            | Orientation Webcast
2   | 9.0            | Reservoir Rock Properties - Online Learning
3   | 1.5            | Session 1
4   | 1.5            | Session 2
5   | 3.0            | Reservoir Material Balance - Online Learning
6   | 1.5            | Reservoir Material Balance - Session 1
4   | 1.5            | Online Learning
1   | 1.5            | Session 2
7   | 2.0            | Decline Curve Analysis and Empirical Approaches - Session 1 and 2
11  | 1.0            | Online Learning
8   | 6.0            | Reserves and Resources - Online Learning
9   | 4.0            | Rate Transient Analysis - Online Learning
10  | 3.0            | Reservoir Fluid Displacement - Online Learning
11  | 2.0            | Reservoir Fluid Displacement - Sessions 1 and 2
7.0  | Online Learning
12  | 4.0            | Enhanced Oil Recovery - Online Learning
13  | 2.0            | Improved Oil Recovery - Session 1
4.0  | Online Learning
14  | 4.0            | Reservoir Simulation
15  | 4.0            | Reservoir Surveillance - Online Learning
1.5  | Session 1
16  | 6.0            | Reservoir Surveillance Fundamentals - Session 1
6.0  | Online Learning
1.5  | Session 2
3.0  | Reservoir Management Fundamentals - Online Learning
1.5  | Session 2

Also available anytime, on-demand (with pre-recorded instructor-led sessions).

PETROSKILLS.COM/BR-BLENDED

2020 Schedule and Tuition (USD)

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<tr>
<td>ABERDEEN, UK</td>
<td>9-12 NOV</td>
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*plus computer charge

2020 Schedule and Tuition (USD)

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Also available anytime, on-demand (with pre-recorded instructor-led sessions).

PETROSKILLS.COM/RE-BLENDED

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

2020 Schedule and Tuition (USD)

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Also available anytime, on-demand (with pre-recorded instructor-led sessions).

PETROSKILLS.COM/BR-BLENDED

RE is also available as a virtual course, which is an enhanced version of the face-to-face public session.
Reservoir Engineering for Other Disciplines

**FOUNDATION**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

- Distribution of Reservoir Properties: structure, fluid contacts, water saturation, and pressure
- Rock Properties: porosity, permeability, capillary pressure, and relative permeability
- Fluid Properties: phase behavior of reservoir fluids; properties of gas, oil, and water; PVT Sampling; and PVT laboratory reports
- Volumetric Calculation of Initial Hydrocarbons in Place: oil in place, gas in place, addressing uncertainty using probabilistic methods, reserve booking practices, and reserve recovery efficiencies
- Material Balance Methods: oil reservoir material balance, Hawken-Dick method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs
- Fluid flow and well performance: radial and linear flow, transient, pseudosteady state, steady state flow regimes, productivity of vertical and horizontal wells
- Aquifer influx and Immiscible Displacement. Fluid displacement process, fractional flow, Buckley Leverett, Wedge, water under running, and gas overriding
- Coning and Casing: 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 reservoirs
- 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

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**Well Test Design and Analysis**

**FOUNDATION**

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

**DESIGNED FOR**

Engineers and geoscientists who want to understand well test 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 curve analysis
- Pressure transient testing for gas and oil 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

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**Enhanced Oil Recovery Fundamentals**

**FOUNDATION**

One-to-three 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 production 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 a 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 design processes - theoretical, laboratory tests, and field pilots
- Plan and implement EOR processes employing the proper empirical, analytical, and theoretical methods
- Forecast rate-time and recovery-time behavior under various EOR methods and analyze reservoir performance
- Assess risks and ways to minimize their impact on project economics
- Monitor reservoir/well behavior

**COURSE CONTENT**

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

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**Chemical Enhanced Oil Recovery Fundamentals**

**SPECIALIZED**

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 EOR projects. This course is also beneficial for other technical personnel with at least a B.S. degree and some experience in reservoir engineering.

**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 flood field design and example field results
- Overview of reservoir simulators for polymer flooding
- Example simulations
- Surfactant/polymer (SP) methods
- Surfactant-brine-oil phase behavior
- Microemulsion properties
- Capillary desaturation and oil mobilization
- Laboratory screening
- Field examples and designs
- Reservoir simulators for SP methods
- Alkaline/Surfactant/Polymer (ASP) methods
- Effect of alkali on phase behavior
- Laboratory screening
- Field examples and designs
- Reservoir simulators for ASP methods
- Example simulations
- Performance Optimization/ 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 modifications and personnel training
RESERVOIR ENGINEERING

Enhanced Oil Recovery with Gas Injection
– EORG

SPECIALIZED  5-Day

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

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

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

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

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 for 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 facilties engineers who have a need to model the flow of gas, water and gas 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 QC PVT Reports
• Use laboratory data to determine values of fluid properties for use in engineering calculations, including Equation of State
• Use correlations to determine values of fluid properties in the absence of laboratory data
• Select the best available fluid property correlations for oils, gases, and clipped fluids
• 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

2020 Schedule and Tuition (USD)

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* plus computer charge

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 costs while maximizing oil recovery and income. This course is light on theory but heavy on proven and successful practices. Published case histories of projects around the world are reviewed to provide an understanding of divergent points-of-view, what works where, what fails when, and why. This training covers all elements of a waterflood project from A to Z - from source water selection to produced water disposal and everything in between. Participants are grouped into small multi-disciplinary teams. All classroom discussions and problem-solving sessions are handled in an asset management team format. Simulation studies are done in class to evaluate basic waterflooding physics as well as to optimize the development of a hypothetical field.

DESIGNED FOR
Reservoir, production, facilities, and operations engineers who are involved with some aspects of a new or existing waterflood project; geoscientists and professionals who want to get a better feel for the entire process of planning, development, management, and recovery 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 impurities • Surface processing of injection and produced water • Water shut-off • Pattern rotation • Natural and hydraulic fractures • Horizontal well applications • Downhole separation • Enhanced waterflooding • Waterflood planning • Many case histories

2020 Schedule and Tuition (USD)

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* plus computer charge

Capillarity in Rocks – CIR

INTERMEDIATE  3-Day

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

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

YOU WILL LEARN HOW TO
• Select the appropriate capillary pressure measurement method for a set of desired results
• Closure correct a set of mercury/air capillary pressure data
• Fit and analyze capillary pressure data using 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 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 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 • Relationships between capillarity and residual saturations • Interpretation of single and multiple pore system rocks • Clay-bound water • Capillary pressure vs. NMR • Seal capacity

2020 Schedule and Tuition (USD)

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2019 Schedule and Tuition (USD)

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* plus computer charge

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+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
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, multi-phase production history, or interpreted 4D seismic information. Field examples will be presented to illustrate the current state of the art and limitations. The use of history matched models for optimizing reservoir development and management strategies will be discussed. The course will involve a combination of theoretical discussion, practical applications, and computer exercises using public domain software to provide the participants with hands-on training on the workflows that can be applied using available commercial software.

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

YOU WILL LEARN HOW TO
• Recognize the difficulties and sources of error in history matching
• Define limitations of various techniques for both conventional and unconventional reservoirs
• Apply theory of streamlines and streamline-assisted history matching for waterflooding
• Understand the background and theory of commercially available assisted/automatic history matching tools and algorithms
• Apply concepts of experimental design/ response surface/surrogate models
• Use learnings from case studies for a systematic procedure for history matching and well placement optimization in a mature field, well rate optimization/allocaton 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 well optimization • History matching: new developments

Integrated Reservoir Modeling – GRD

INTERMEDIATE 5-Day

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

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

YOU WILL LEARN HOW TO
• Develop the workflow in the reservoir integration process
• Evaluate and quantify uncertainties in various sources of data
• Build a geo-cellular model using geostatistical tools and upscale to obtain 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

This newly revised course will cover the definitions of, and uses for, oil and gas reserves estimates, and how to be compliant with each of the industry standard (SPE-PRMS) and regulator’s US SEC versions of the reserves requirements. Participants will learn how geoscience and engineering evaluation methods should be used for compliance of reserves estimates, the differences in the evaluation assumptions between PRMS and SEC, and how the inherent uncertainties in reserve estimates are reflected by the categorization of reserves. Participants will learn how to handle reserve estimation-related situations properly, including documentation, audits, SEC enquiries, and evaluation ethics. This understanding is reinforced by working class problems and case studies.

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
• Interpret and apply the 2018 SPE-PRMS reserves definitions and principles
• Interpret and apply the US SEC reserve definitions under SEC reporting regulations
• Generate compliant reserves estimates and reports using either PRMS or SEC definitions
• Comprehend and work with a typical third-party reserves report
• Understand the proper use of traditional engineering and geoscience techniques to satisfy reserve reporting requirements
• Demonstrate the robustness of modern techniques in your reserve estimates
• Prepare for audit reviews of your reserves estimates by third-party auditors, the SEC, or banks
• Document and defend your reserve estimates for internal inspection or internal historical records

COURSE CONTENT
Detailed examination of the updated SPE-PRMS for oil and gas reserves • What reserves means to the regulator: understanding SEC reserve definitions and reporting – how to be compliant with SEC regulations (including demonstrating a “reliable technology”) • Examples of reserve typical questions - comparing PRMS and SEC compliance • Reserve evaluation - what to watch for when using each of the different calculation methods (including probabilistic analysis and dynamic reservoir simulation) to ensure compliant reserves • How to document and defend reserve estimates – understanding reserve audits, SEC issues/communique letters, bank lending evaluations • Economics and entitlements impact on reserves • General topics: case studies, reserves in unconventional reservoirs and/or IOR/EOR projects, ethics

Reservoir Characterization: A Multi-Disciplinary Team Approach – RC

INTERMEDIATE 5-Day

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

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

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

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

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

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

2020 Schedule and Tuition (USD)

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* plus computer charge

2020 Schedule and Tuition (USD)

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2020 Schedule and Tuition (USD)

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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 synergetic 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 synergetic approach to efficient reservoir management
- Include each reservoir management component and the importance of timing and cost/benefit analysis
- Develop checks and balances

COURSE CONTENT

Definition of reservoir management: an integrated, interdisciplinary team effort • Goal setting, planning, implementing, monitoring, and evaluating reservoir performance • Field development and field operating plans to optimize profitability • Efficient monitoring of reservoir performance • Minimalizing 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

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 some key elements and issues associated with the exploitation of unconventional reservoirs (light gas, light oil, and shales). The course is built around the role of the reservoir engineer and, hence, concerns itself with the value 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 wells 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 (DFITs & PBU's)
- 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

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

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 are aided by modeling of various kind. 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

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 griddng methods • Two dimensional displacement • Grid orientation and refinement • Routine and special core analysis • Single phase up-scaling of geo-cellular model parameters

2020 Schedule and Tuition (USD)

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Decline Curve Analysis and Diagnostic Methods for Performance Forecasting
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 curves 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, Staggs’, P/2 vs. P, etc.) for rate and reserves analysis
• Use advanced decline curve and production data analysis for reservoir characterization

COURSE CONTENT
Conventional decline curve equations: exponential, hyperbolic and harmonic rate versus time and rate versus cumulative production relationships, selecting the proper equation based on reservoir properties and drive mechanisms
• The effects of transient production: how to recognize transient production, how transient forecasts can overestimate remaining reserves, how to properly constrain transient forecasts
• Forecasting during displacement processes: using trends like water-oil ratio and versus cumulative oil production to estimate ultimate oil recovery, converting these trends into an oil rate versus time forecast
• Difficult situations: layered and compartmented reservoirs, downtime, workovers, changing facility conditions and facility constraints, forecasting groups of wells, common missteps
• Production decline type-curves: introduction and historical background, how to use modern Fetkovich type-curves for forecasting production • Brief discussion of unconventional gas/oil reservoir decline analysis and production forecast

Gas Reservoir Management
SPECIALIZED 5-Day
Natural gas production has become a major part of every petroleum company’s asset base and continues to grow in importance throughout the world. This course will help participants understand the engineering drivers on gas reservoir management and how a gas reservoir’s value can be maximized through sound engineering practices. A full spectrum of gas reservoir engineering techniques is addressed and their application to a large variety of gas resource management options is discussed.

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

COMMENTS FROM PREVIOUS PARTICIPANTS:
"Very good practical approach to the material - course is highly recommended." * Instructor did a great job relating the theory to potential applications."
"Exercises were practical and useful."

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

COURSE CONTENT
Gas reservoir fluid properties: gas condensate sampling and understanding laboratory reports
• Gas reservoir fluid flow and well testing: deliverability testing and non-darcy flow, testing for 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 wellbores and pipelines: the gas production system, pressure drop in wellbores 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, coiled methane reservoirs

Horizontal and Multilateral Wells: Analysis and Design
SPECIALIZED 5-Day
The complex, interdisciplinary decisions in advanced well projects are emphasized in this course. The application and benefits of horizontal and multilateral wells are analyzed. The process of candidate screening and selection, involving geological, reservoir, and production characteristics are considered, as well as constraints on drilling and completion options. Methods to predict well performance and recovery from horizontal and multilateral wells are presented with integration of inflow and wellbore flow performance for individual and multilateral wells. Well completion options and its impact on well performance for horizontal and multilateral wells are summarized. The improvement by well stimulation (multistage hydraulic fracturing and matrix acidizing) is evaluated. Economic and risk analysis are also presented with a number of case histories to highlight the performance and benefits of horizontal wells and the elements of risk and uncertainty at the initial design stage.

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

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

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

Naturally Fractured Reservoirs: Geologic and Engineering Analysis
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 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
**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 reserves in mature fields.

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

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

**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 sweep areas and drainage volumes
- Optimize infill wells
- Perform reservoir surveillance and flood optimization using streamlines
- Integrate streamlines with finite-difference simulators
- Validate upscaled and upgridded 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, N-51, SOPR, NPQ, Chinese, as well as other standards, is taught as a stand-alone module. A majority of the offering is focused on shale oil and shale gas resources, with selected coverage of tight gas, coalbed methane, and coal seam gas plays also being included, depending on participant interest.

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

**YOU WILL LEARN HOW TO**
- Differentiate reserve estimation approaches within shale ofgas, tight gas, CBM/CCS, 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
- Analyze 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 • Reserve data collection programs • Reserve revisions • Reserve portfolio management • Alternate evaluation approaches • Ethics and public information releases

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- Midstream Overview
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- Steam Cracking

**Introduction to Solvents**

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**2020 Schedule and Tuition (USD)**

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See website for dates and locations.

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*plus computer charge
Production and Completions Engineering

Course Progression Matrix

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 – PO1 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:
Completions and Workovers – CAW

FOUNDATION 5-Day
An integrated introduction to many facets of completion and intervention technology. The material progresses through each of the major design, diagnostic, and intervention technologies concluding with some common remedial measures and well abandonment. The course focuses on the practical aspects of each of the technologies, using design examples - successes and failures - to illustrate the key points of the design and the risks/uncertainties. The overall objectives of the course focus on delivering and maintaining well quality.

DESIGNED FOR
Graduates or engineers with experience, engaged in drilling operations, production operations, workover, and completions; petroleum engineering in both the service and operating sectors.

YOU WILL LEARN HOW TO
• Develop a high level completion strategy for wells in a variety of situations
• Select tubing, packers, and completion flow control equipment
• Appraise/design a flow barrier strategy
• Identify key design considerations for vertical and inclined wells, horizontal, multilateral, HPHT, and unconventional resource wells
• Select intervention strategy/equipment
• Identify key features/applicability of the main sand control and well stimulation options
• Assess/specify concerns/remedial measures for formation damage/skin removal

COURSE CONTENT
Basic well completion design, practices, and strategies • Well quality and integrity • Safety aspects of well design • Wellheads, trees, subsurface safety valves, and flow control equipment • Material selection guidelines based on corrosion and erosion conditions • Interpretation of inflow and tubing performance to aid tubing size selection • Tubing design and selection • Considerations for designing deviated horizontal, multilateral, and multi zone reservoir completions • Basic completion principles and considerations for subsea, HPHT, and unconventional wells • Perforating job selection and design • Formation damage mechanisms and remediation • Stimulation design considerations • Sand control options and their selection • Wireline, coiled tubing, and hydraulic workover rig operations • Snubbing

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

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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 advancements to maximize oil and gas production and overall resource recovery. The course structure and pace apply a logical approach to learn safe, least cost, integrated analytical skills to successfully define and manage oil and gas operations. Applied skills guide the participant with a framework to make careful, prudent, technical and oil and gas business decisions. Currently emerging practices in the exploitation of unconventional resources including shale gas and oil, and heavy oil and bitumen complement broad, specific coverage of conventional resource extraction.

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

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

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

Production Operations 1 – PO1

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Start Date</th>
<th>End Date</th>
<th>Tuition</th>
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2020 Schedule and Tuition (USD)

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

13 APR-31 JULY 2020 
US$7570
Also available anytime, on-demand (with pre-recorded instructor-led sessions).
Production Technology for Other Disciplines – PTO

FOUNDATION 5-Day

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

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

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

COURSE CONTENT
• Role and tasks of production technology • Completion design • Inflow and outflow performance • Artificial lift well completion systems (beam pump, gas-lift, ESP, PCC, plunger lift) • Formation damage and well acidifying • Perforating practices • Sand control • Hydraulic fracturing • Shale gas and oil development • and more...

Well Stimulation: Practical and Applied – WS

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 property 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

COURSE CONTENT
• Geological/basica 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 focus 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 a 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 a 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 treating procedures
• A description of treating equipment whether located on the surface, offshore platform, or sea floor

COURSE CONTENT
• Properties of fluids at surface • Flowlines, piping, gathering systems; solids and liquid limits • Well - water/gas/solids - contaminants • Separation and treatment • 2–3 phase separators, free water separators, centrifugal, filter • Storage tanks, gun barrels, pressure/vacuum relief, flame arrestors • Stabilizers • Foams, emulsions, paraffins, asphaltene • Hydrocyclones, membranes • Acid gas treatment: coals, 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/Scalants: inhibition and treatment

Coiled Tubing Interventions – CTI

FOUNDATION 5-Day

Coiled Tubing is one of the most common technologies used for well interventions on a daily basis throughout the oil industry during drilling, completion, and mainly production phases of oil and gas wells around the world. This course covers the surface and pressure control equipment, the bottomhole assembly components (downhole tools), the string manufacturing and operational limits, the interventions performed with coiled tubing (20+ different pumping and mechanical interventions including coiled tubing drill out and coiled tubing drilling), and how to deal with fatigue and corrosion. Nitrogen equipment and calculations required for constant / variable temperature and commingled nitrogen interventions are also covered.

The final part presents an extensive coverage of emergency responses and contingencies to deal with in a wide variety of scenarios. A generous amount of time is spent in practical exercises, and technical concepts are enhanced with pictures, videos and numerous real field cases and problems. Participants will gain the knowledge to actively and efficiently participate in coiled tubing intervention’s planning, design and/or execution.

DESIGNED FOR
Well interventions or well services supervisors, operations or field Engineers, coiled tubing supervisors and operators, sub-surface engineers, production engineers, drilling engineers, completion engineers, and those professionals willing to expand their knowledge in coiled tubing and nitrogen interventions planning, design and/or execution.

YOU WILL LEARN HOW TO
• Plan, design, manage, and execute coiled tubing interventions
• Improve the overall operational performance during coiled tubing interventions
• Select or recommend coiled tubing equipment for given field conditions and applications
• Select the proper pressure control equipment for any particular well condition
• Calculate the appropriate size of accumulators for a coiled tubing unit
• Select the most commonly used downhole tools and explain their function
• Calculate and define coiled tubing string limits
• Recognize, prevent, and manage corrosion and sour conditions and their impact
• Work safely with liquid nitrogen
• Calculate nitrogen volumes required for a given application
• Take appropriate actions during emergency responses and contingencies

COURSE CONTENT
• Introduction • Surface equipment • Pressure control equipment • Bottomhole assembly components • Coiled tubing strings • Operational limits • Pumping operations • Mechanical operations • Life estimation (fatigue) • Corrosion • String management • Checklists • Nitrogen • Emergency responses and contingencies

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

PETROSKILLS.COM/VIRTUAL-PTO

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
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<th>Dates</th>
<th>Tuition</th>
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2020 Schedule and Tuition (USD)

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*plus computer charge
**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 casing and cemented, open hole with external casing packers, and open hole pump and pray techniques. This course will also 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.

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**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 flow strings, restrictions, multi-lateral branches, horizontal/hilly 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 • Artificial Lift – PO2: Gas lift design, ESP and other methods • Artificial Lift – PO2: Gas lift design, ESP and other methods.

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**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.
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<table>
<thead>
<tr>
<th>Downhole Remediation Practices for Mature Oil and Gas Wells – DRP</th>
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<td><strong>FOUNDATION</strong> 5-Day</td>
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<tr>
<td>Downhole Remediation for Mature Oil and Gas Wells is presented from a practical point of view. Discussions include decision processes for selection, design, and application of methods that are supported by field experiences and research results. Principal focus is production-related near wellbore damage and remedial water control practices.</td>
</tr>
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| **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 reservoirs are explained. 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. |

| **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 provides 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 are covered. Attendees should leave the advanced course with a better understanding of the hydraulic fracturing process and how it relates to post-frac well performance, after working on real fracturing cases design and analysis throughout the course. |

| **YOU WILL LEARN HOW TO** |
| • Diagnose and develop removal and prevention techniques for wellbore damage due to scale, paraffin, asphaltenes, corrosion, and erosion |
| • Understand sources, causes, and effects of water production |
| • Design remediation applications (both mechanical and chemical) for reducing excess water production |
| • Design sand control applications and understand how to fix damaged screens and gravel packs |
| • Understand how and when to apply remedial cementing practices and what tools and job considerations are critical |
| • Apply these techniques to a specific well problem that you bring into the classroom from your current field assignment |

| **COURSE CONTENT** |
| Production-related near wellbore damage • Scale • Paraffin • Asphaltenes • Corrosion • Erosion • Well diagnostics • Removal techniques • Prevention techniques • Wellbore stabilization • Understanding unwanted water production • Extent of the problem • Causes and effects of water production • Monitoring and evaluation techniques • Diagnostics • Defining required attributes and placement controls • Fitting solutions to problems • Remedial water control • Challenges and solutions • Environmental considerations • In-wellbore control • Near-wellbore techniques • Matrix applications • Fractures and voids • Water control • Bringing it all together • Engineered process • Initial screening • Reservoir characterization • Simulation • Case studies |

| **HYDRAULIC FRACTURING APPLICATIONS – HFU** |
| **ADVANCED HYDRAULIC FRACTURING – AHF** |
| **ACIDIZING APPLICATIONS IN SANDSTONES AND CARBONATES – ASC** |

| **YOU WILL LEARN HOW TO** |
| • 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 |
| • Recognize the strengths and limitations of hydraulic fracturing treatment and how it relates to post-frac well performance |
| • Recognize opportunities for substantial improvement in well production |
| • Reformulate the details and discussion of fracturing concepts usually accepted or assumed in fracturing applications |
| • More effectively design fracturing treatments through better understanding of factors influencing hydraulic fracturing applications |
| • Use pre-frac injection test data and real-time fracturing treatment data in fracturing applications to define fracture parameters and improve frac treatment design |
| • Assess a well’s need for acid stimulation |
| • Recognize the strengths and limitations of acidizing as a tool for stimulation purposes |
| • Investigate production problems from the standpoint of damage removal and improvement in well production |
| • Apply acid treatments strategically to improve success |
| • Recognize opportunities for enhancement of acid treatments using non-acid fluids |

| **COURSE CONTENT** |
| Hydraulic fracturing – HFU |
| Advanced hydraulic fracturing – AHF |
| Acidizing applications in sandstones and carbonates – ASC |

| **2020 Schedule and Tuition (USD)** |
| Houston, US | 14-19 Dec | $470 |
| Kuala Lumpur, Malaysia | 6-10 July | $535 |
| London, UK | 7-11 Sep | $5159+VAT |
| **2020 Schedule and Tuition (USD)** |
| Houston, US | 2-6 Nov | $4510 |
| **2020 Schedule and Tuition (USD)** |
| Denver, US | 30 Mar-3 Apr | $4605 |
| Houston, US | 22-26 June | $4610 |
| Midland, US | 21-25 Sep | $4555 |
| **2020 Schedule and Tuition (USD)** |
| Houston, US | 11-15 May | $4510 |

Any course is available in-house 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 designs, 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 PCP plunger lift, 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 included. Examples of 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
• Apply 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 pipe flow 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/scale/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 • Selection criteria • Reservoir performance • Artificial lift screening • Economic analysis • Rod pump, gas lift and ESP equipment selection and design • Best practices for each system

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 efficiently. 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/stages. 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 3).

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
• Understand the importance of identifying and agreeing on the objectives of producing optimization and artificial lift early in the well planning cycle
• Identify the critical differences and requirements for applying artificial lift to unconventional vs. conventional wells
• Evaluate the effect of changing Inflow Performance Relationship (IPR) over time, how to construct and profitably utilize relevant IPR curves
• Recognize the benefits and challenges of applying Systems Nodal Analysis in artificial lift for unconventional wells
• Identify the strengths and weaknesses of each major artificial lift method used
• Manage challenges and issues in operating artificial lift and how to troubleshoot/mitigate them
• Select an effective artificial lift method for individual unconventional resources wells
• Analyze staging of artificial lift methods over time to enhance value
• Understand the importance of surface pressure and facilities
• Develop a comprehensive artificial lift strategy for an area/field/display

COURSE CONTENT
Artificial lift objectives, value, rate and recovery costs • Differences between conventional and unconventional wells • Applying Nodal Analysis and using IPR curves • and more...

Beam Pumps – BP

Intermediate 5-Day
This course will allow the user to become familiar with the beam pump system and its best application. Beam pumping is the most common and cost-effective artificial lift method. The course includes a detailed description of all the components in a beam pumping system, including the prime mover, bell's/sheaves/ gear box, PRs, wellhead/ stuffing box, sucker rods/ sinker bars and downhole pumps. Design and analysis, using industry computer software is also included. Films are shown throughout the course to illustrate new products and best practices. Exercises designed to illustrate the process and decision-making criteria to select the optimum lift method will be worked by participants throughout the course. Problems related to solids production, gas handling, and viscosity are addressed. The course also covers beam pumps and rod protection in horizontal wells, optimum placement of the 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 cases. One personal computer is provided, at additional cost, for every two participants.

DESIGNED FOR
Engineers and field technicians who are responsible for the selection, operation, and maintenance of beam pumping systems

YOU WILL LEARN HOW TO
• Design systems with optimum efficiency, economical production, longer operating life, high energy efficiency and safe performance
• Perform maintenance and monitor system performance using POC's (on/off and VSD types)
• Identify and select optional system components for optimum performance
• Design and analyze a system using computer software
• Monitor equipment performance with SCADA systems
• Apply best practices to extend system life

COURSE CONTENT
Reservoir characteristics • Overview of artificial lift • Design and analysis of the beam pump system • Prime mover • Bell's Sheaves • Gear box • Unit • Rods • Pump • Tubing • Artificial lift efficiency • Heavy oil considerations • Gas separation/handling • Best operating practices • Component design • System analysis • Pump off controllers

Electrical Submersible Pumps – ESP

Intermediate 5-Day
ESP's have advantages over some of the other artificial lift methods because they can generate a higher formation drawdown, and achieve a higher rate. However, their performance is impacted by gas interference and formation sand production, both of which have to be addressed when setting ESPs in production wells. This course will familiarize the user with the ESP system and it’s optimum application. All components will be described in detail. The course uses computer software for numerous design and analysis class problems. Some films will be shown to illustrate the installation, operation, and removal of failed equipment, new production technology, and comparisons are made to other lift methods to help facilitate the optimum method selection. Problems related to solids production, gas handling and viscosity are addressed. Best practices are stressed throughout so that a long lasting system can be designed to achieve optimum well performance. SCADA controls and VSDs are discussed. Participants will learn the function of each component, and important considerations about installation, operation, and removal of failed equipment. Participants will be able to evaluate the design of a system for current and future conditions, analyze an installed system, and review multiple operational aspects of the ESP system. Although the course uses industry computer software for design and analysis, much of the material is devoted to best practices, which is useful to both engineers and technicians. The common practice of using ESPs in unconventional wells with sharply declining production rates is also discussed.

DESIGNED FOR
Engineers and field technicians who are responsible for the selection, operation, and maintenance and monitoring of ESP systems.

YOU WILL LEARN HOW TO
• Optimize well productivity using ESP systems
• Identify the function of each component of the ESP system, and to select optional components and add-ons
• Design and analyze a system using computer software
• Apply best practices to extend system life
• Optimize system power efficiency
• Manage gas, solids, corrosion, and viscosity associated with produced fluids
• Determine if an ESP system is the optimum artificial lift system for a given producer
• Monitor system performance using the different types of sensors available

COURSE CONTENT
Introduction to artificial lift and electrical submersible pumping • Reservoir and production considerations for ESP installation • Description of every component comprising the electrical submersible pump system • Installation considerations and important best practices to apply • Design of an ESP system to fit current and future well conditions

2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
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</thead>
<tbody>
<tr>
<td>CALGARY, CAN</td>
<td>11-15 MAY</td>
<td>$4380 + GST</td>
</tr>
<tr>
<td>HOUSTON, US</td>
<td>3-7 JUN</td>
<td>$4435</td>
</tr>
<tr>
<td>LONDON, UK</td>
<td>19-23 OCT</td>
<td>$5160 + VAT</td>
</tr>
</tbody>
</table>

See website for dates and locations.

Any course is available in-house at your location. Contact us today.
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, has a long operating life and requires no power to operate in most wells. Each component of a plunger lift system is described in detail, and tools for analysis are provided to participants. Several methods of cycles analysis, including analysis by shape of the SCADA traces of CP, TP, rate, and LP are discussed and applied throughout the course using a spreadsheet provided to participants to estimate 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 are presented. Details about plunger lift operation are covered, with emphasis on trouble free cycles and more gas production. Continuous (by-pass), conventional, gas assisted and casing plunger lift are presented. Special equipment and techniques used in unconventional or horizontal wells are discussed, as well as the effect that well deviation has on system operation. The course has a good balance between slide and video presentations, example problems, and group discussion. Some programs and SS will be distributed to the participants. 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 from field performance, using critical velocity, and nodal analysis. Decline curve analysis is discussed.
• Understand the advantages and disadvantages of using a plunger system to lift a well, compared to other lift methods, and the optimum conditions to use one method over another.
• 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 to methods to solve loading problems; Lifting capability comparison between Plunger Lift and other artificial lift methods; Continuous Plunger Lift; Conventional Plunger Lift; Trouble shooting using decline curves, SCADA traces, and cycle set points; Drawdown capability of plunger lift; IFRs for plunger lift; Systems used to monitor plunger in the well; What systems to use when conventional plunger no longer works.

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 to deeper water, longer tiebacks, deeper wells, and higher temperature and pressure reservoirs. Although gas hydrate issues dominate the thermohydraulic 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 basic properties of reservoir fluids and how they are modeled for the production flowline system.
• Understand the thermohydraulic modeling of steady state and transient multiphase flow in offshore production systems.
• Evaluate and compare mitigation and remediation tools, 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 • PV/T 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 oils • Thermal modeling • Multiphase pressure boosting • Slugging: hydrodynamic, terrain induced, and ramp up • Commissioning, start-up, and shutdown operations.

Formation Damage: Causes, Prevention, and Remediation – FD

INTERMEDIATE 5-Day

Formation damage seems to be inevitable and it is costing your company money! Whether formation damage can be prevented, reduced economically, or must be accepted as the price for drilling and producing a well will depend upon many factors. Concerns for formation damage have been with our industry from the early days. These concerns become more prevalent as we embark on more challenging reservoirs utilizing even more challenging drilling, completion, and production methods. Additional concerns relate to the common lost production or injectivity following workovers in these challenging environments. These subjects and many more are addressed in this fast-paced, informative course covering all aspects of formation damage. Examples, case histories, and class team exercises are used throughout the course to emphasize key points on this important industry subject. This subject is briefly covered in the PetroSkills Production Operations 1 course (Foundation Level) as well as in the Well Stimulation: Practical and Applied (Basic Level) course. However, this course is more concentrated, detailed, and applied in the subject matter than either of the other courses.

DESIGNED FOR

Production, reservoir, drilling engineers, geologists concerned with well performance and production enhancement; field supervisors, production foremen, engineering technicians, production and exploration managers; those involved in vertical, horizontal, and multilateral wells, conventional and unconventional reservoirs.

YOU WILL LEARN HOW TO

• Recognize formation damage and damage mechanisms in carbonates, sandstones, and shales.
• Prevent and overcome damage, when it exists, through the application of non-acid approaches, acidizing, and small fracturing treatments.

COURSE CONTENT

Geological/depositional environment, reservoir properties review • Properties influencing formation damage • Damaging sandstones, shales and carbonates, clay mineralogy • Damage mechanisms and causes of damage: fluids and polymers, during drilling, running pipe and cementing, from perforating, during well completions, during production (fines migration, paraffin, scale, etc.), during workovers, and damage to injection wells • Evaluating damage potential: laboratory testing • Evaluating wells that may be damaged: production performance, pressure analysis, production logging • Damage removal: non-acid approaches, acidizing, and bypassing damage with hydraulic fracturing
Problem-solving sessions allow participants to evaluate field problems. Participants receive complimentary software at the end of the course.

**DESIGNED FOR**
Production, reservoir and facilities engineers, and others involved in gas production, transportation, and storage including field supervisors.

**YOU WILL LEARN HOW TO**
- Apply proven techniques to field problems which increase profitability
- Calculate gas well performance from the reservoir to the sales line
- Optimize gas well production
- Relate reservoir and well performance to time
- Predict when a well will die due to liquid loading

**COURSE CONTENT**
Gas properties: real gas behavior equations of state, impurities, mixtures, phase behavior dew point, retrograde behavior, flash calculations; classifying gas reservoirs; Reservoir performance: gas well testing flow after flow, isochronal, stabilized influx performance; turbulence and skin effects; perforation effects; tight well analysis; horizontal wells; hydraulically fractured wells; Reserve calculations: P/Z plots, energy plots, water influx, abnormal pressure effects; diagnostic testing based on production data.
- Flow in pipes and restrictions; pressure loss tubing, flowlines, chokes, safety valves; effects of liquids-liquid loading, liquid removal methods, multiphase flow correlations; erosional velocity.
- Compression: types of compressors; compressor selection reciprocating and centrifugal; effects of variables; capacity and horsepower.
- Total system analysis: tubing and flowline size effects; perforating effects; relating deliverability to time; evaluating compressor installations; analyzing injection wells.
- Flow measuring: orifice metering design, accuracy, troubleshooting; other metering methods.
- Condensate reservoirs; reservoir types - wet gas, gas condensate, vapor; reservoir development, laboratory simulation; gas cycling; Field operations problems: interpreting P/Z plots; hydrate formation.

**Gas Production Engineering – GPO**
INTERMEDIATE 5-Day

Learn the latest methods for calculating gas well performance from reservoir to sales. Reservoir performance covers the fundamentals of reservoir gas flow and details the best methods for testing wells, according to the time and money available. Reserve calculations and diagnostic testing from production data are covered. The importance of flow regime and non-Darcy flow on test design and interpretation is emphasized for new wells and for the possibility of improving the performance of older wells. Also discussed are performances of tight formations, horizontal wells, fractured wells, and methods for estimating gas reserves. Participants will learn to calculate and determine the effect of each system component on total wall performance, which permits optimum sizing of tubing, flowlines, separators, and compressors. Problem-solving sessions allow participants to evaluate field problems. Participants receive complimentary software at the end of the course.

**DESIGNED FOR**
Production, reservoir and facilities engineers, and others involved in gas production, transportation, and storage including field supervisors.

**YOU WILL LEARN HOW TO**
- Apply proven techniques to field problems which increase profitability
- Calculate gas well performance from the reservoir to the sales line
- Optimize gas well production
- Relate reservoir and well performance to time
- Predict when a well will die due to liquid loading

**COURSE CONTENT**
Gas properties: real gas behavior equations of state, impurities, mixtures, phase behavior, dew point, retrograde behavior, flash calculations; classifying gas reservoirs; Reservoir performance: gas well testing flow after flow, isochronal, stabilized influx performance; turbulence and skin effects; perforation effects; tight well analysis; horizontal wells; hydraulically fractured wells; Reserve calculations: P/Z plots, energy plots, water influx, abnormal pressure effects; diagnostic testing based on production data.
- Flow in pipes and restrictions; pressure loss tubing, flowlines, chokes, safety valves; effects of liquids-liquid loading, liquid removal methods, multiphase flow correlations; erosional velocity.
- Compression: types of compressors; compressor selection reciprocating and centrifugal; effects of variables; capacity and horsepower.
- Total system analysis: tubing and flowline size effects; perforating effects; relating deliverability to time; evaluating compressor installations; analyzing injection wells.
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- Condensate reservoirs; reservoir types - wet gas, gas condensate, vapor; reservoir development, laboratory simulation; gas cycling; Field operations problems: interpreting P/Z plots; hydrate formation.

**Gas Well Deliquification – GWD**
INTERMEDIATE 5-Day

As gas wells deplete, the velocity in the tubing drops and eventually liquids from the well and from condensation begin to accumulate in the tubing. This increase of liquids in the tubing adds back pressure on the formation, which in turn reduces flow or even stops flow all together. The course introduces this problem and discusses how to recognize liquid loading as opposed to other possible well problems. The course will then cover the various methods of solving the problem of liquid loading, showing how to apply the various solutions and the advantages and disadvantages of each method. Solution methods include use of surfactants, velocity strings, compression, use of plunger lift, various other pumping methods, gas lift, and the injection of fluids below a packer so gas can flow up the annulus. Participants will learn to recognize the problems and symptoms of liquid loading, determine which methods can solve the problem and select the optimum method's after attending the course. There are about 400,000 gas wells in the USA and most are liquid loaded. Solving this problem may be the average increase production by ~40% per well. Special considerations for the use of each system in unconventional or horizontal wells are also discussed.

**DESIGNED FOR**
Engineers, field technicians, field supervisors, and others who select, design, install, monitor, and evaluate, or operate artificial lift systems for use in dewatering gas wells.

**YOU WILL LEARN HOW TO**
- Maximize gas production using optimized dewatering techniques
- Recognize liquid loading in a gas well using field symptoms, critical velocity, and nodal analysis
- Recognize the advantages and disadvantages of various methods of liquid removal
- Best install and troubleshoot the various methods
- Understand economics of each method covered

**COURSE CONTENT**
Recognize symptoms of liquid loading in gas wells
- Critical velocity to analyze wells loading or red
- Optimize techniques with nodal analysis
- Sizing tubing • Compression: selection, sizing, and operation
- Plunger lift: cavitator (hypervelocity), conventional and gas assisted
- Use of foam to deliquify gas wells
- Hydraulic pumps • Use of beam pumps to deliquify gas wells
- Gas lift • Electrical submersible pumps • Progressive cavity pumps
- Other methods to solve liquid loading problems

**Scale Identification, Remediation and Prevention Workshop – SIR**

**PetroSkills® PetroAcademy**
INTERMEDIATE 5-Day

Scale Identification, Remediation and Prevention is an essential part of a production or work over engineer’s scope of work. This workshop provides a comprehensive overview of dilemmas in operating producing and injection wells related to the presence of a variety of oilfield scale types — primarily reduction in pipe carrying 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 mathematical scale prediction methods are presented and numerous preventive methods, both chemical and unique approaches, are covered.

**DESIGNED 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 principal methods for scale identification and how to recognize other methods and their application for removing scale according to 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/L.S. Rice U ScaleSoftPl antis software • Scale prevention and inhibition

**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.

**DESIGNED FOR**
Production engineers, facility engineers, chemists, and technicians involved with production systems from the wellbore through the topside production equipment, transmission pipelines, and storage facilities who 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 and control water 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 • Demulsifier selection and field application • Foams • Deoilers • Foam basics • Field application of foams • How deoilers 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 gas hydrate formation • Causes of paraffin (wax) problems • Paraffin treatment chemicals • Asphaltene stability tests • Asphaltene treatment chemicals • Chemicals used as H₂S scavengers • Application of H₂S scavengers • Oil carryover in water • Removal of oil and oily solids • Tests required for chemicals used in deep water • Green chemicals (environmentally friendly chemicals)
Production Logging – RMP

INTERMEDIATE

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Wellbore environment and tool deployment considerations • Depth control issues and natural gamma ray logging • Cement bond logs • Ultrasonic imaging logs • Conventional temperature logs • Conventional spinner (flowmeter) logs • Conventional fluid holdup logs (gamma density, capacitance, differential-pressure) • Radioactive tracer logs • Noise logs • Temperature from fiber optic cable • Pulsed neutron capture logs (including oxygen activation and nonradioactive traces) • Pulsed neutron spectroscopy logs • Array mini-spinner logs • Array fluid holdup logs (optical, capacitance, and resistance) • Multiphase flow and slip velocity • Effects of hole-deviation on fluid holdup and multiphase flow velocities • Combining production logs for multiphase flow profiling • Combining production logs for injection well profiling • Designing a production logging program for problem identification and solution

2020 Schedule and Tuition (USD)

HOUSTON, US
14-18 DEC $4510
13-17 JULY $5235+VAT

London, UK

LONDON, UK 3-7 AUG $5235+VAT

* plus computer charge

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

20 APR-5 JUNE 2020 US$4325

Sand Control – SNDC

INTERMEDIATE

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 several different 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.

DESIGNED 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 prepackaging and enhanced prepacking • Frac packing • Open hole gravel packing • Expandable screens • Gravel pack performance • Horizontal well completions

2020 Schedule and Tuition (USD)

HOUSTON, US
12-16 OCT $4510
KUALA LUMPUR, MALAYSIA 22-26 JUNE $5425
LONDON, UK 3-7 AUG $5235+VAT

PETROSKILLS.COM/VIRTUALSNDC

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

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 of fulfilling 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

PRE-REQUISITES
Completion of the following courses:
• Miniproject Water treatment equipment - theory of operation, disposal and treatment principles • Produced water discharge/ sampling and analysis • Water formed scales • Produced (oily) water treatment options and related treatment equipment

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 treating equipment - theory of operation, advantages and disadvantages, and the importance of oil droplet size • Water injection and disposal systems - theory of operation, corrosion, scale, and biological control • Case study

YOU WILL LEARN HOW TO
• 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

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

FUNDAMENTAL 5-Day
This course provides an overview of the main water handling systems typically encountered in upstream (ESP) 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, as well as water injection and disposal systems will be reviewed. An exercise will be given to identify typical system problems and to apply the knowledge gained to propose solutions. Emphasis will be placed on understanding and resolving operational problems in process equipment.

DESIGNED FOR
Managers, engineers, chemists, and operators involved in establishing, improving, optimizing, or supervising the implementation of technology improvements. This course will be useful to personnel in completion, 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 technology options, advantages, and limitations
• Choose the most advantageous technology given the site conditions
• Design or specify the equipment capable of fulfilling 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

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

DESIGNED FOR
Central processing facility operators and process designers dealing with heavy oil produced water separation, recovery, and treatment for reuse or disposal. Personnel involved in developing, improving, optimizing, or supervising the operation of technology enhancements. This course will be useful to personnel in completion, 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 technology options, advantages, and limitations
• Choose the most advantageous technology given the site conditions
• Design or specify the equipment capable of fulfilling 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

INTERMEDIATE 5-Day
Any course is available in-house at your location. Contact us today.

+1.918.828.2500  |  petroskills.com  |  +1.800.821.5933 (toll free North America)
Competent Person Fall Protection – FPST

BASIC 5-Day
This comprehensive training program is for anyone who develops or impacts fall protection policy, as well as those involved with design practices, facility or production 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 hazard control 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 2350 family
• The difference between certified and non-certified anchorages
• 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 • Anchorages • Horizontal lifelines • Rescue

Applied Environmental Management Systems – AEM

FOUNDATION 5-Day
Since the Rio do 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 spillsages, toxic releases, fires, and other pollution events. There are efficiency opportunities from better use of energy, water and from reducing waste in a systematic way. Participants will receive a template Environmental Management System (EMS) manual for their own use as part of the study materials. This class provides a complete review of the international standard for environmental management, ISO 14001:2015, as well as other environmental management techniques. Over five days, the course 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 organisation
• Communicate a powerful improvement message to a team of senior leaders

COURSE CONTENT
Context of the organization • Leadership and commitment • OH&S policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities • Objectives and planning to achieve them • Support (competence, awareness, communication, documentation) • Operational planning and control • Emergency preparedness and response • Monitoring, measurement, analysis, and evaluation • Internal audit • Management review • Improvement

Applied Occupational Health and Safety Management Systems – HSM

FOUNDATION 5-Day
Every 15 seconds, somewhere in the world, a worker is killed and over 150 others are injured. Our members’ and clients’ experience is that committed application of an Occupational Health and Safety Management System (OHSMS) can reduce such incidents, while providing a platform for sustained cultural change. We call this “predict and prevent” instead of the unstructured approach of “react and remediate.” Participants will receive a template OH&S-MS manual for their own use as part of the study materials. This class provides a complete review of the new international standard for occupational health and safety management, ISO 45001:2018, as well as an overview of other common OH&S-MS (AS4801, ILO OS&H-2001, KOPG HSE-MS) that can be aligned to organizations’ own systems. Over five days, the class works through a Plan, Do, Check, Act improvement cycle teaching the tools and techniques of excellent practice. The course includes a week-long practical implementation case study set in the fictional highly-realistic setting of oil products distribution company Melvis Group where the new learning is validated through application. Please see www.melvisgroup.com for more information.

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

YOU WILL LEARN HOW TO
• Successfully design and use the principle elements of an OH&S-MS in a typical petrochemical organisation
• Identify and integrate key tools associated with OH&S management, including HSE, risk assessment, JSA, PTW, LOTO, active and reactive monitoring
• Reflect on, shape and initiate improvements in the safety culture of an organisation
• Communicate a powerful improvement message to a team of senior leaders

COURSE CONTENT
Context of the organization • Leadership and commitment • OH&S policy • Roles, responsibilities, and authorities • Actions to address risks and opportunities • Objectives and planning to achieve them • Support (competence, awareness, communication, documentation) • Operational planning and control • Emergency preparedness and performance • Process safety application and management • Health and Safety Management (PSM) and describe processes associated with PSM • Reliability • Management of change • Conduct safety audits • Safe work practices • Asset integrity and maintenance • Compliance with standards • Understand and comply with OSH regulations • Identify and integrate key tools associated with OH&S management, including HSE, risk assessment, JSA, PTW, LOTO, active and reactive monitoring • Reflect on, shape and initiate improvements in the safety culture of an organisation • Communicate a powerful improvement message to a team of senior leaders

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 “RBS Guidelines” will be the text for this course. Participants selected 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 process) • Measurement and metrics • Management review and continuous improvement

See website for dates and locations.

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2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>City</th>
<th>Date</th>
<th>Course</th>
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<td>27-31 JULY</td>
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<td>$5155+VAT</td>
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</table>
COURSE CONTENT
Business context for Process Safety  •  Risk assessment (hazard identification, hazard scenarios, consequence and likelihood analysis, and risk analysis and tools and techniques)  •  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 (governance and culture)

Spill Control and Remediation Engineering – SCRE

FOUNDATION  5-Day

This course will cover the fundamentals of Process Safety for all staff levels of processing facilities in the upstream and downstream oil, gas, and petrochemical 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. The associated 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. It is relevant to roles, including senior management, project and engineering support teams, HSE support, supervisors, and operator and maintenance technicians. An understanding is provided of the design basis and essentials for safe operations, without addressing the more detailed calculation aspects covered in Process Safety Engineering PS2.

YOU WILL LEARN HOW TO
 •  Identify the systems and processes required to enhance 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
Spill causes, detection, response and communication derived from the incident  •  Equipment used to control spills, HSE Emergency Spill Response  •  Contaminated land remediation technologies  •  Bioremediation, phyto remediation, composting, and permanent solidification and disposal

Management Systems Lead Auditor – AUD

INTERMEDIATE  5-Day

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. This course is approved by the International Institute of Risk and Safety Management (IIRSM) in conjunction with SMC - see www.iirsm.org.

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

YOU WILL LEARN HOW TO
 •  Lead/participate in an audit or review in line with the standards of the auditing profession, including ISO 19011
 •  Initiate an internal audit plan
 •  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
Introducing

**Accredited H&S Professional: GradIOSH, CMIOSH and ASP by Applied Learning (Level 6 NVQ Diploma in Occupational Health and Safety Practice) - HSP**

Achieve Chartered Membership (CMIOSH) of the Institution of Occupational Safety and Health (IOSH) by flexible, distance learning. IOSH is the world’s largest health and safety professional body, and its membership credentials are recognized globally.

This is a mentored program typically lasting 12 months (532 guided hours). Each participant has a personal mentor and adviser who works with them on a flexible, one-to-one basis. Our support is tailored to meet your needs, including meetings where it is reasonable to do so. Regular communication is usually through e-conference, e-mail and telephone. You can start at any time, and you can work at a pace that suits you and your job. This qualification is accepted by IOSH for Graduate membership (GradIOSH). CMIOSH is awarded after successful application and completion of an open book examination and professional interview. The Board of Certified Safety Professionals (BCSP) has a credential agreement with IOSH to accept GradIOSH for its Associate Safety Professional (ASP) designation. ASP, once a designation in the process of becoming a CSP, is now a full certification and internationally accredited by the American National Standards Institute (ANSI).

**Course Content**

The syllabus has been designed to cover the competencies of a Health and Safety Professional. There are 10 mandatory units in the qualification, which are completed by presenting and explaining work-based evidence:

1. Promote a positive health and safety culture
2. Develop and implement the health and safety policy
3. Develop and implement effective communication systems for health and safety information
4. Develop and maintain individual and organizational competence in health and safety matters
5. Identify, assess, and control health and safety risks
6. Develop and implement proactive monitoring systems for health and safety
7. Develop and implement reactive monitoring systems for health and safety
8. Develop and implement health and safety emergency response systems and procedures
9. Develop and implement health and safety review systems
10. Maintain knowledge of improvements to influence health and safety practices

**Design For**

Experienced health and safety managers, officers, and advisers seeking professional recognition of their prior skills. You must be an active practitioner with at least two years’ experience.

**For more details, see page 47 or petroskills.com/hsp**
Applied Maintenance Management – OM21

BASIC 5-Day

No matter the price of oil, safe, efficient operations require well managed, integrated asset management. Effective, well organized maintenance management is the key. In 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 preventative 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

Operations & Maintenance

Comments From Participants in our Virtual PetroAcademy Courses

Applied Reservoir Engineering
“The instructor was a true pleasure to learn from, both in the synchronous sessions, and in the prerecorded videos. He had an excellent command of the subject matter, and presented ideas clearly and with common sense and humour.” - Michael

Production Operations 1
“I liked the flexibility to be able to handle the course load at my own pace. Not having to take two weeks off work and travel to Houston was a deciding factor.” - Jacob

Applied Reservoir Engineering
“I liked being able to spend an extended amount of time on a topic…” - Nicole

Check out our virtual and blended courses! Go to petroskills.com/online

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Online Learning for Operations & Maintenance

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- Electrical
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- Health, Environmental, Safety, and Security
- Instrumentation
- Mechanical Maintenance
- Pipeline Fundamentals
- Process Operations
- Production Operations
- Refinery Operations
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- Rotating & Reciprocating Equipment
- Stationary Equipment
- Turnaround Planning

**ePetro™**

Online Learning for Petroleum Professionals

ePetro™ is ideal for both technical and business-oriented professionals who are either new to the petroleum industry or could benefit from an industry overview. The series incorporates information for geosciences, reservoirs, production, drilling, completions, and field development and includes:

- Oil & Gas Industry History
- E & P Asset Life Cycle
- Reservoir Fluids
- Exploration & Appraisal
- Development & Production
- Mature Assets & Abandonment
- Midstream
- Gas Manufacturing
- Refining
- Petrochemicals

For more information, visit www.petroskills.com/elearning or email solutions@petroskills.com
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 it will contribute to the financial success of your company. The course will introduce delegates to the structure of the petroleum business including supplies 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 basic 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 its ownership
• 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

Expanded Basic Petroleum Economics – BEC

BASIC 5-Day

Could you answer the following three questions for your next project? What will it cost? What is it worth? Will it earn sufficient profit? Before undertaking any project, these questions should be answered. This course will provide the fundamentals necessary to enable you to do so.

Budgeting and financing, accounting, and contractual arrangements, which also significantly impact the economic viability of a project, are covered. Participants practice cash flow techniques for economic evaluations and investigate frequently encountered situations.

Participants are invited to submit their own economic problems (in advance), if appropriate. Each participant will receive Economics of Worldwide Petroleum Production, written specifically for PetroSkills courses.

DESIGNED FOR

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

YOU WILL LEARN

• How to evaluate the economic viability of a project
• Cash flow techniques applicable in economic evaluations
• Models to weigh risk and uncertainty
• Techniques to determine expected value
• The 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 effecting oil and gas prices • Cash flow techniques • Economic criteria: interest, hurdle rate, time value of money, selection, ranking criteria • Risk, uncertainty: types of risk, mathematical techniques, probabilistic models, uncertainty in economic analysis • Financing, ownership in the oil and gas industry: business arrangements between operators, between mineral owners • Accounting versus cash flow: accounting principles and definitions, differences between accounting cash numbers, depreciation, depletion, amortization • Budgeting: types, processes, selecting of projects for the budget • Economic analysis of operations • Computer economics software • Tips on economic factors in computer spreadsheet analysis • Ethics in economic analyses

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. This seminar/workshop you will explore your internal drivers and learn how to combine them with new skills for greater effectiveness.

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2020 Schedule and Tuition (USD)

HOUSTON, US 14-16 SEP $3250

* plus computer charge

PetroSkills

PETROLEUM BUSINESS

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We’ll handle the rest

PETROSKILLS CONFERENCE CENTER

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MANAGING NON-TECHNICAL RISKS

Supporting business delivery on time and within budget.

Managing Non-Technical Risks - MNTR

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, security, 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 perspectives to business decision making. A key methodology is the quantification of non-technical risks because it helps prioritization 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 up 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 • Internal organizational and cultural complexities and challenges and practical solutions • Leave with a blueprint for implementation in your own company • Essential international standards as required by international lenders and institutions • and more...

For more information, or to register, go to petroskills.com/mntr

PetroSkills®

Managing Non-Technical Risks – MNTR

BASIC 4-Day

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, security, 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 perspectives to business decision making. A key methodology is the quantification of non-technical risks because it helps prioritization and focusing of resources and mitigating activities.

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• Essential concepts of stakeholder engagement, including dealing with activist stakeholders
• How to set up 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
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For more information, or to register, go to petroskills.com/mntr

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Economics of Worldwide Petroleum Production – EWP

FOUNDATIONS 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 uncertainly, cost structures, rate of return, and other economic yardsticks enhance the quality and the value of the 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. Those 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 in the field as the course content is more advanced than Expanded Basic Petroleum Economics. Take one or the other, but not both courses.

YOU WILL LEARN HOW TO
• Use cash flow techniques in economic evaluations
• Evaluate and choose investment opportunities
• Use models to weigh risk and uncertainty
• Evaluate decision alternatives using predictive techniques
• Evaluate how projects effect the corporation

COURSE CONTENT
• Pricing: natural gas, marker crudes, OPEC, spot and futures markets, transportation
• Production rate: mathematical models
• Cash flow: revenue, capital and operating costs, spreadsheet exercises
• Economic 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 write-off decision: depreciation, depletion, and amortization
• How to read an annual report: statements, 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

FOUNDATIONS 5-Day

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

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

YOU WILL LEARN HOW TO
• Describe the elements of the decision analysis process and the respective roles of management and the analysis team
• Express and interpret judgments about risks and uncertainties as probability distributions and popular statistics
• Represent discrete risk events in Venn diagrams, probability trees, and joint probability tables
• Solve for expected values with decision trees, payoff tables, and Monte Carlo simulation (hand calculations)
• Craft and solve decision models
• Evaluate probability models 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, modeling correlations, Basic Probability and Statistics: four fundamental rules including Bayes’ rule (the easy way), calibration and eliciting judgments, choosing distribution types, common misconceptions about probability
• Evaluating a multi-pay-prospect (team exercise), and more

Advanced Decision Analysis with Portfolio and Project Modeling – ADA

SPECIALIZED 5-Day

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 tree decision 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.decisionanalysisapplications.com/adapre-read to review a course prerequisites list and to take a short self-assessment quiz. You may login using “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 OPA 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-prospect risk and cost risk policy modeling 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 analysis; 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

Cost Management – CM

FOUNDATIONS 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 result of these efforts, our product’s fluctuations widen, 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 company’s success and even their ultimate survival. As the energy industry goes through its most monumental changes since the 1970’s, 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 Cost Management (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 costs 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 efficiency
• 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 and budgeting for monitoring performance
• Optimizing the supply chain
• Developing and analyzing capital investment projects

2020 Schedule and Tuition (USD)

<table>
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<th>Dates</th>
<th>Tuition USD</th>
<th>VAT (USD)</th>
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<td>LONDON, UK</td>
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Any course is available in-house at your location. Contact us today.

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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 IFRS and U.S. GAAP
- Apply basic concepts and terminology for accounting 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 analyze financial reports and basic oil and gas ratios

**COURSE CONTENT**
Getting started: financial terms and definitions, the language of accounting; basic 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

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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, 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 (orshore, offshore, and deep sea bed)  
- Expropriation and compensation issues  
- State-owned entities and privatization  
- Law 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  
- Legislative agreements and unitized operations  
- Environmental protection laws  
- Criminal and civil liability for oil spills  
- International and state-owned entities, and recognition and enforcement of judgments and arbitration awards  
- Basic legal concepts of ownership of mineral rights (orshore, offshore, and deep sea bed)  
- Expropriation and compensation issues  
- State-owned entities and privatization  
- Law bearing on development rights  
- Legal interpretational issues of common contract provisions  
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- Transfer and protection of technology and confidential business information  
- Legislative agreements and unitized operations  
- Environmental protection laws  
- Criminal and civil liability for oil spills  
- International and state-owned entities, and recognition and enforcement of judgments and arbitration awards

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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 value 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 type 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 economic and non-financial issues  
- Analysis of contract provisions  
- Model contract  
- Natural gas production under international contracts  
- Negotiations workshop  
- Ethics in international petroleum operations

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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 optimize 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 strategies and markets 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 changers
- 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  
- Scenario analysis and planning  
- Six sigma  
- Boston Consulting Group (BCG) growth share matrix  
- Personal application of strategic thinking

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2020 Schedule and Tuition (USD)

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See website for dates and locations.

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2020 Schedule and Tuition (USD)

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See website for dates and locations.

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2020 Schedule and Tuition (USD)

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<td>HOUSTON, US</td>
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See website for dates and locations.

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Any course is available in-house at your location. Contact us today.
Contracts and Tenders Fundamentals – SC41

**FOUNDATION 3-Day**
This three-day course is designed to help companies award the right contracts to the best providers. Contracting involves many roles that must work together to negotiate, document, and ensure a reliable supply of goods and services for capital projects and ongoing operations. Everyone involved in contracting with suppliers and service providers must understand the entire process, the keys to success, and what is required of their role if contracts are to be effective in managing supply risks. Materials and exercises in this course are specifically built around oil and gas industry issues.

**DESIGNED FOR**
Individuals involved in any aspect of sourcing, tendering, selecting, forming, and executing contracts with suppliers of goods and services to the oil and gas industry. Included are project technical roles such as facilities engineers, drilling engineers, project engineers, commissioning engineers, contractors, engineers, and planning engineers.

**YOU WILL LEARN**
• How to better manage project and legal risks with the contracting process
• How to successfully manage disputes and contract performance issues
• and more...

**2020 Schedule and Tuition (USD)**
HOUSTON, US 14-16 SEP $3310

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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 years’ experience either inside or outside the oil and gas industry.

**YOU WILL LEARN**
• 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 and more...

**2020 Schedule and Tuition (USD)**
HOUSTON, US 17-19 AUG $3370

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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

**2020 Schedule and Tuition (USD)**
HOUSTON, US 1-2 OCT $2645

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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 PSCM in oil and gas today. In many organizations, more than half of the total revenue is spent on goods and services, everything from raw materials 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. SOA 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

**2020 Schedule and Tuition (USD)**
HOUSTON, US 5-7 OCT $3370

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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. Existing best practices by major oil and gas companies are explored under three interrelated modules - inventory management, warehousing, and investment recovery.

**DESIGNED FOR**
Professional and management personnel who have responsibility for materials, spare parts, and supplies 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, consigned inventory, and integrated supply agreements
• and more...

**2020 Schedule and Tuition (USD)**
HOUSTON, US 1-2 OCT $2645

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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 the 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. 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.

**YOU WILL LEARN**
• The Supplier Relationship Management Maturity Model
• Importance of SRM in continuous improvement
• and more...

**2020 Schedule and Tuition (USD)**
HOUSTON, US 28-30 SEP $3370

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Total Cost Concepts in Supply Management – SC65

**INTERMEDIATE 3-Day**
The increasing cost pressures in the oil and gas industry have generated a need to develop strategies for the procurement of all goods, equipment, materials, and services that are required to achieve the high levels of cost improvements. Total cost/price analysis, cost models, and total cost of ownership concepts are essential skill sets in developing and implementing the strategies required to achieve the high levels of cost reductions possible from the supply chain. Total cost of ownership models are 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

**2020 Schedule and Tuition (USD)**
HOUSTON, US 5-7 OCT $3370
### Petroleum Project and Program Management Essentials – P3ME

**FOUNDATION 3-DAY**

Petroleum companies often use projects to develop the skills of early career project professionals. This course covers the essential skills of petroleum project and program management and provides an opportunity to apply those skills to your project. You will be able to utilize fit-for-purpose prioritization techniques and control tools to facilitate successful outcomes. The specific training received in planning, scheduling and risk management will help the early career professional make the best decisions possible. Participants will learn how the project management, HSE, engineering, operations, maintenance, procurement/ supply chain, and transportation disciplines relate to one another and what tools are available to ensure interfaces among key stakeholders are managed. The course is taught using a combination of instruction, facilitated discussion, and team exercises using real-world examples related to facilities, drilling, and maintenance. The exercises will 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.

**YOU WILL LEARN HOW TO**
- Apply essential work management techniques to a variety of tasks
- Identify key constraints and interfaces and develop action plans to address them
- Develop charts, scopes of work, schedules and cost estimates
- Prioritize the work to best meet evolving operations needs
- Prepare petroleum project execution plans and procedures
- Utilize progress measurement and control techniques
- Use dashboards to track progress of larger programs and identify areas that need attention

**COURSE CONTENT**
- The petroleum project delivery system
- Organization and resources
- Engineering, maintenance and operations
- The execution plan
- HSE and risk management
- Procurement and contracting
- Cost management
- Planning and scheduling
- Progress measurement
- Program management essentials

### 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. Instruction, guided discussions and in-depth work tasks are used. You may choose a case study from several real-life situations that are based on the instructor’s petroleum experience. Or you may bring the details of one of your current programs.

**DESIGNED FOR**
- Exploration and production personnel with a background in geoscience, petroleum engineering or drilling who 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

### 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 training received in planning, scheduling 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.

**DESIGNED FOR**
- Project managers, facility engineers, construction representatives, schedulers, cost controllers, and purchasing personnel who plan, manage, or participate on multi-discipline teams. This course also addresses the essential requirements associated with managing programs whose timely completion is essential to the success of regional operations.

**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

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### 2020 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Location</th>
<th>Dates</th>
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<tr>
<td>– FPM2</td>
<td>Project Management in Upstream Field Development</td>
<td>Houston, US</td>
<td>24-26 Aug</td>
<td>$3310</td>
<td></td>
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<tr>
<td>– FPM22</td>
<td>Project Management for Engineering and Construction</td>
<td>Houston, US</td>
<td>13-17 Jul</td>
<td>$4510</td>
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*Plus computer charge*
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 productivity. To be successful, brownfield 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.

DESIGNED FOR
This course is for team members that work projects installed in existing facilities. Engineers, operations leads, and maintenance reps should attend. Services personnel in cost, schedule, procurement, and quality functions will also benefit. 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 with due 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

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 methods that project team leaders can utilize to ensure that project team members and management buy in and are part of the risk management process.

DESIGNED FOR
Project managers, project engineers, and all disciplines that work on integrated project teams for upstream offshore 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 agreement 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 review peers

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 larger programs, these complex 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 work 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 advanced course is suitable for business, commercial, and financial 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
• Address key stakeholders needs
• Establish a process to manage critical interfaces
• Lessen the impact of risks on cost, schedule, and operations
• Navigate approvals challenges to advance your project

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

Project Controls for Capital Projects - PC21

INTERMEDIATE 3-Day

This course addresses project controls principles and practices as they relate to providing project leaders and key stakeholders the information they need to support project success for upstream, downstream, and brownfield energy projects. The focus of the course is using project controls effectively to manage engineering / procurement / construction, improve 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 effectively manage their project. Participants will understand all of the steps necessary to develop and implement an effective project controls plan. Project controls activities throughout the entire project life cycle (FEED, engineering, construction) are addressed. In particular, participants will learn that a project leader should take during each stage of the project life cycle to effectively manage their project and their contractor.

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

YOU WILL LEARN
• The elements of a robust cost estimate plan
• Methods to develop early and mid life cycle project cost estimates
• The critical role that project controls plays in developing a well-planned and executable project for both cost and schedule
• The role that project definition, scope management, contracting strategy, project execution, procurement, etc. play in impacting project controls and the methods used to measure progress
• Critical progression measurement metrics using earned value or value of work done so that stakeholders understand the potential to meet project cost and schedule
• The different estimate classes and the deliverables required to support each type of estimate
• The different schedule levels and when it is appropriate to use each level
• How to develop an estimate basis and schedule basis and why they are critical to developing an achievable cost estimate and schedule
• How to develop a robust Project Controls Plan and associated staff with roles and responsibilities to support the plan
• How to effectively manage project changes and understand the impact on overall cost and schedule
• Challenges and issues associated with forecasting final project cost and final project completion using progress measurement or earned value
• and more...

2020 Schedule and Tuition (USD)

HOUSTON, US 6-10 JULY $4510
LONDON, UK 7-11 DEC $5235 +VAT

HOUSTON, US 3-5 AUG $3370

2020 Schedule and Tuition (USD)

HOUSTON, US 14-18 SEP $4510

2020 Schedule and Tuition (USD)

HOUSTON, US 21-25 SEP $4610

Any course is available in-house at your location. Contact us today.

+1.918.828.2450 | petroskills.com | +1.800.821.5933 (toll free North America)
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

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

This course is designed for senior project management staff of EPC contractors working on large international projects in the energy industry with a focus on the Middle East Region. It is recommended 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
• Handle 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 PFC

Construction Management for the Project Professional – FPM64

SPECIALIZED  3-Day

NEW

This course addresses the skills necessary to interface with and effectively manage field construction. While construction projects are addressed, the project engineer that must manage engineering, procurement, and, especially field construction, will find the course particularly useful. The course addresses how to effectively manage field construction to deliver the project on time and on budget. While many projects do front and loading effectively, projects ultimately fail due to poor execution or engineering/construction. With a focus on construction, this course provides the tools necessary to establish the proper field organization to manage engineering and procurement, which are two key inputs to construction success. The case study focuses on a construction project that is challenged in the field (due to prior poor decisions) that the project leader must address to be successful. Exercises, the case study, and class discussions provide learnings that the participant can immediately apply upon returning to work.

DESIGNED FOR

This course is designed for project managers, project engineers, facilities engineers, construction managers, discipline engineers, operations staff, and all disciplines that work on integrated project teams for onshore and offshore projects.

YOU WILL LEARN

• How the construction schedule should drive engineering and not vice versa
• How to manage the construction contractor and influence their field supervisors to deliver a successful project
• Methods to establish the appropriate owner’s construction team given the construction strategy and construction challenges to ensure a successful project
• How to interface with the home office and engineering contractor to ensure field requests for information, engineering drawings, timing of material delivery, etc. support project success
• Root causes of poor craft field productivity and what the owner can do to improve productivity to support aggressive project cost and schedule targets
• The ‘Fatal Four’ issues associated with construction personal safety
• How to use field project controls and progress monitoring to ascertain construction areas that are challenged and require immediate attention
• Methods to manage the contractor to minimize construction claims and how to handle a claim once it occurs
• and much more...

COURSE CONTENT

The role that construction management plays during FEED and detailed engineering to support success in the field • Field project controls, learning, buildup of field indirect changes, determination of ‘all in’ field labor costs, etc. • Temporary construction facilities, construction infrastructure, field equipment, etc. and the role they play in construction success • and much more...

Petroleum Project Changes and Claims Workshop – PPCC

SPECIALIZED  3-Day

NEW

This course will cover all key aspects of project changes and claims encountered throughout a project lifecycle. The focus will be on how to manage and control changes, take steps to prevent disputes and claims, and how to prepare claims. Different contract types will also be covered along with the required terms and conditions for project changes, disputes and claims. This course will not follow the traditional lecture-style format; instead it will be an interactive hands-on workshop where after a brief slide presentation for each agenda topic the participants will work on several real-life case study scenarios directly related to the selected topics. The workshop will cover both onshore and offshore projects.

DESIGNED FOR

Project managers, project controls managers, project engineers, discipline leads, procurement managers, contract managers, and construction managers and supervisors working on large onshore or offshore oil and gas projects.

YOU WILL LEARN

• What causes changes, disputes and claims on a project
• How to manage changes to minimize their impact on project scope, cost and schedule
• How to control the cost and schedule impact on a project using earned value
• An overview of contract types, negotiations and alternate dispute resolutions
• Key steps to take for claim prevention
• How to prepare a claim - type of claim, main elements, and the PMT role

COURSE CONTENT

What causes change on a project and can change be avoided • Change management and controls • Cost and schedule management of changes using earned value • Types of contracts and relevant terms and conditions - from tender to award • Negotiation techniques and alternative dispute resolution • How to avoid disputes on a project • Types of project claims and their characteristics • Claims prevention • Claims preparation • Case Study Problems - will cover topics listed in the agenda and will include both onshore and offshore scope.

Petroleum Project Changes and Claims Workshop – PPCC

See website for dates and locations.

2020 Schedule and Tuition (USD)

CALGARY, CAN  15-17 JUNE $3385+GST
DUBAI, UAE  27-29 SEP $4285+VAT

2020 Schedule and Tuition (USD)

HOUSTON, US  16-18 NOV $3430
HOUSTON, US  30 NOV-2 DEC $3430

ADD 'PEOPLE SKILLS'
ADD ‘PEOPLE SKILLS’ TO YOUR TECHNICAL SKILLS

PetroSkills Petroleum Professional Development courses provide the people skills to help you and your team maximize your capabilities. These courses are tailored specifically to the oil and gas industry, and are available worldwide.

ESSENTIAL LEADERSHIP SKILLS FOR TECHNICAL PROFESSIONALS-OM23
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 to help you be more effective, with less stress. (See page 51.)

ESSENTIAL TECHNICAL WRITING SKILLS-ETWS
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.

MAKING CHANGE HAPPEN: PEOPLE AND PROCESS-MCPP
Attendees will work in teams to overcome the problems encountered when making changes in their organizations. You will 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.

MANAGING AND LEADING OTHERS-MLO
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.

MEETING MANAGEMENT AND FACILITATION FOR THE PETROLEUM INDUSTRY-MMF
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 become virtual breeding grounds for confusion, tension, frustration, boredom, and negativity. 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 efficiently, effectively, and smoothly.

NEGOTIATION SKILLS FOR THE PETROLEUM INDUSTRY-NSPI
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 conducting a collaborative negotiation, allows attendees to engage in, comment on, and improve their competencies in negotiation skills.

PRESENTATION SKILLS FOR THE PETROLEUM INDUSTRY-PSPI
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. With the proper training and practice, any oil and gas professional can learn to make a convincing and persuasive presentation, and do so in a confident, assured, comfortable, and relaxed manner.

TEAM BUILDING FOR INTACT TEAMS-TB
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.

TEAM LEADERSHIP-TLS
This course has been constructed to maximize opportunity to improve both knowledge and practical skills in leading a team and being a team player. Emphasis is placed on the leader’s role in effectively enhancing total team functionality and maximum team productivity.

Go to www.petroskills.com/ppd to register or for more information!
MR. PETER AIRD has 38 years’ experience as an oilfield drilling, well engineering, and operations specialist. Peter initially served and trained as a marine engineer officer working with major shipping companies worldwide. 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, Indonesia, Malaysia, Vietnam, China), North Atlantic (West of Britain, Norway, Faroe), 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 with operating companies including Kerr McGee, Maersk & Marathon Oil, Cairn Energy (UK), ONGC (India), Cenrica (Norway), and Providence Resources (Ireland). His drilling specialty was further refined on a variety of subsea, horizontal, platform in-fill, HPHT, deep and ultra deep-water drilling projects. Peter is a member of the Society of Petroleum Engineers from 1991, the Energy Institute, and is a Chartered Engineer 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.

MR. GEORGE ARMISTEAD has worked over 43 years for Unocal and Chevron in various Gulf of Mexico regional offices in assignments as drilling engineer, production engineer, drilling superintendent, drilling manager, asset manager, drilling engineering manager, and consulting drilling engineer. Since joining Chevron in 2005, he has served as a consulting drilling engineer with Chevron doing project planning on the Congo River Crossing well intersection project and teaching the Drilling Engineering and Well Planning, Drilling Practices, Deepwater Drilling, and Drilling for Non-Drillers Courses for Chevron. He has extensive experience in ultra-deep, high pressure, high temperature, sour service and extended reach drilling applications. During his career, George has developed a borehole fracture modeling technique for well design, a splitter wellhead and mud line suspension wellhead systems and an extended reach planning and screening technique. George has a great interest in well design, innovative drilling and completion methods, adhering to technical excellence in drilling engineering and knowledge sharing and mentoring. George Armistead is a registered professional petroleum engineer in the states of Texas and Louisiana. George graduated with honors from Mississippi State University with a BS degree in Petroleum Engineering in 1974.

MR. STEPHEN ASBURY is the author of six internationally published books on safety and risk management, and a highly experienced HSE practitioner and instructor. He is a Chartered Safety and Health Practitioner (CIFOSH), a Chartered Environmentalist (CEnv, FIEMA), and a Professional Member of the Institute ofodical Safety Management (IPSM). Stephen has been developing and delivering training courses relating to Geostatistics for integrated reservoir modeling. Dr. Bahar is proficient in using commercial software (PETREL) in customizing C++ software for reservoir modeling, and has performed flow simulation study using an Eclipse flow simulator. He has been coordinating the operation of various on-going consulting studies and projects, including: Reservoir Rock Type Modeling, Stochastic Property Modeling, Fracture Identification and History Matching, Fracture Modeling and Integration into Reservoir Model, UAE Reservoir Evaluation, Integrated Reservoir Characterization, Field development, Safety and HSE consultancy, Petroleum Engineering, and PetroSkills, a former SPE Distinguished Lecturer, SPWLA Distinguished Speaker. Dr. Bahar received his BS in Mechanical Engineering from the Institut Teknologi Bandung in Indonesia.

MR. OSORALD ARCHER is Professor of the Mighty River Power Chair in Geothermal Reservoir Engineering as well as Head of the Department of Engineering Science at the University of Auckland in New Zealand. She is also Director of Auckland Geothermal Institute. She has received several awards including the Supreme Excellence in Teaching Award within the Faculty of Engineering. She is an accomplished technical writer, collaborator and editor with over 25 articles published in the last five years. Dr. Archer has taught courses on Well Testing, Reservoir Engineering, Reservoir Simulation and PVT Analysis for industrial clients including Chevron/Schlumberger, Chevron, China, ONGC, Petronas, Yukos Petroleum, PPT Exploration and Schlumberger. She directs her own consulting practice undertaking technical work, expert witness work and training for a wide range of clients. She has performed technical work for Todd Energy, Shell Todd Oil Services, Australian Pacific Energy, Greyhounds Petroleum, Mighty River Power, Genesis Energy, Scott Hawkins (USA) and Sigma Energy (USA). She holds PhD and MS degrees in Petroleum Engineering from Stanford University and a BE degree in Engineering Science from the University of Auckland.

MR. GEORGE ARMISTEAD has worked over 43 years for Unocal and Chevron in various Gulf of Mexico regional offices in assignments as drilling engineer, production engineer, drilling superintendent, drilling manager, asset manager, drilling engineering manager, and consulting drilling engineer. Since joining Chevron in 2005, he has served as a consulting drilling engineer with Chevron doing project planning on the Congo River Crossing well intersection project and teaching the Drilling Engineering and Well Planning, Drilling Practices, Deepwater Drilling, and Drilling for Non-Drillers Courses for Chevron. He has extensive experience in ultra-deep, high pressure, high temperature, sour service and extended reach drilling applications. During his career, George has developed a borehole fracture modeling technique for well design, a splitter wellhead and mud line suspension wellhead systems and an extended reach planning and screening technique. George has a great interest in well design, innovative drilling and completion methods, adhering to technical excellence in drilling engineering and knowledge sharing and mentoring. George Armistead is a registered professional petroleum engineer in the states of Texas and Louisiana. George graduated with honors from Mississippi State University with a BS degree in Petroleum Engineering in 1974.

MR. STEPHEN ASBURY is the author of six internationally published books on safety and risk management, and a highly experienced HSE practitioner and instructor. He is a Chartered Safety and Health Practitioner (CIFOSH), a Chartered Environmentalist (CEnv, FIEMA), and a Professional Member of the Institute ofodical Safety Management (IPSM). Stephen has been developing and delivering training courses relating to Geostatistics for integrated reservoir modeling. Dr. Bahar is proficient in using commercial software (PETREL) in customizing C++ software for reservoir modeling, and has performed flow simulation study using an Eclipse flow simulator. He has been coordinating the operation of various on-going consulting studies and projects, including: Reservoir Rock Type Modeling, Stochastic Property Modeling, Fracture Identification and History Matching, Fracture Modeling and Integration into Reservoir Model, UAE Reservoir Evaluation, Integrated Reservoir Characterization, Field development, Safety and HSE consultancy, Petroleum Engineering, and PetroSkills, a former SPE Distinguished Lecturer, SPWLA Distinguished Speaker. Dr. Bahar received his BS in Mechanical Engineering from the Institut Teknologi Bandung in Indonesia.

MR. OSORALD ARCHER is Professor of the Mighty River Power Chair in Geothermal Reservoir Engineering as well as Head of the Department of Engineering Science at the University of Auckland in New Zealand. She is also Director of Auckland Geothermal Institute. She has received several awards including the Supreme Excellence in Teaching Award within the Faculty of Engineering. She is an accomplished technical writer, collaborator and editor with over 25 articles published in the last five years. Dr. Archer has taught courses on Well Testing, Reservoir Engineering, Reservoir Simulation and PVT Analysis for industrial clients including Chevron/Schlumberger, Chevron, China, ONGC, Petronas, Yukos Petroleum, PPT Exploration and Schlumberger. She directs her own consulting practice undertaking technical work, expert witness work and training for a wide range of clients. She has performed technical work for Todd Energy, Shell Todd Oil Services, Australian Pacific Energy, Greyhounds Petroleum, Mighty River Power, Genesis Energy, Scott Hawkins (USA) and Sigma Energy (USA). She holds PhD and MS degrees in Petroleum Engineering from Stanford University and a BE degree in Engineering Science from the University of Auckland.
Adjunct Professor of Petroleum Engineering at the University of Tulsa and a member of its Industrial Advisory Board. He is the author of numerous technical publications, the recipient of several professorships, research, teaching and merit awards and listed in the Who’s Who in Science and Engineering. He received a Chemical Engineering State Diploma from the National Polytechnic School of Algiers, an MS and a PhD from the University of Tulsa.

MR. PAUL M. BARRY is a petroleum engineering consultant specializing in production operations and oilfield development and management. Mr. Barry has over 44 years of international upstream oil and gas production and reservoir engineering and management experience resident in various US locations, South America, SE Asia, the Middle East, and the North Sea. He has been a consultant and PetroSkills instructor since 2002. With PetroSkills, he was based in Perth, Australia from 2007-2008 and in Dubai, UAE, from 2003-2006, developing PetroSkills regional business in both locations. Industry experience has been as a consultant for shale oil and gas exploration operations, involving gas turbine manufacturing, power generation, nuclear and fossil power plants, electrical distribution and control, air conditioning equipment and global sourcing services. Prior to becoming a full-time consultant in 1994, he served as Manager of Customer and Supplier Development for the Westinghouse Trading Company. He has given presentations on numerous purchasing and contract management topics to the Institute for Supply Management (ISNIA/PM), major universities, and numerous in-house seminars for industrial and services clients in the US and over 170 public seminars internationally. He was selected to present seminars at the last 17 Institute for Supply Management International Conferences and is the contributor of numerous articles published in Purchasing Today and Inside Supply Management. Robi was selected as ISM’s National Person of the Year in both Global Resources and in Education/Learning. Robi is a lifetime CPM, and has received ISM’s new certification, the Certified Procurement Professional (CPP), for his work on CIPS. He has an undergraduate degree from the University of Texas, and a Master’s Degree from Penn State University. His energetic and enthusiastic style, combined with extensive functional experience, makes him an excellent consultant, trainer, and facilitator of change.

MR. JAMES BOBO retired from ConocoPhillips as a Principle Drilling Engineer. Mr. Bobo has served in various management and project leadership roles in drilling, production, gas processing, and gathering and information systems throughout the basins in the lower 48 states. In addition, he has served in key facilitator roles for well control operations in Papua New Guinea, Nova Scotia, and other high-pressure, high-temperature projects. Prior to this assignment, Mr. Bobo was the lower 48 regional coordinator for ConocoPhillips. He is actively involved in society-level efforts related to continuing education, licensure, and professional development, along with the technical advisory boards for several universities. He earned his BS degree in petroleum engineering from the University of Tulsa.

DR. STEVEN E. BOYER holds degrees in geology from Bucknell University (Lewisburg, PA; BS 1972) and Johns Hopkins University (Baltimore, MD; PhD 1978). Dr. Boyer has worked in numerous geologic provinces: the central and southern Appalachian Mountains; the Utah-Wyoming and Brooks Range thrust belts; the interaction of basement-involving structures and thin-skinned thrusting in Montana; the Basin and Range extensional province (Utah and Nevada); and inversion tectonics of the back-arc region, Kangean Island and vicinity, Indonesia. As an independent researcher and consultant, Dr. Boyer continues to study the geometry and kinematics of compressional terranes and the implications of mechanics and kinematics for the timing of trap formation relative to hydrocarbon generation and migration. Dr. Boyer’s industry experience has included thrust belt oil field development, structural field schools, cross-section construction and balancing short courses, and consulting for several major oil companies. His research focuses on deep water environments, and he has appeared in such publications as the AAPG Bulletin, Journal of Structural Geology, as well as two papers in books on thrust belts and course notes related to cross section construction and balancing. Dr. Boyer received the Best Paper Award (Boyer & Elliott, 1982, AAPG Bulletin) from the Geological Society of America, and was named Distinguished Lecturer by the American Association of Petroleum Geologists (1992-1993). He is a Fellow of the Geological Society of America and has served as an AAPG and SRP Geology and Geology. Dr. Boyer is a Member and Fellow of the AAPG, where he has also served as associate editor of the Bulletin.

MR. FORD BRETT is recognized worldwide as a leader in the area of Petroleum Project and Process Management. A registered Professional Engineer, Mr. Brett has consulted in over 45 countries on five continents. Formerly, Mr. Brett worked with Amoco Production Company where he specialized in drilling projects in the Bering Sea, North Slope of Alaska, Gulf of Mexico, offshore Trinidad and Wyoming. He has received many honors, including the 2000 Crosby Medalion for Global Competitiveness by the American Society for Competitiveness for its work in global competitiveness through quality in knowledge management, best practices transfer, and operations improvement. For his work on improved drilling techniques he was also honored in 1996 with a nomination for the National Medal of Technology, the US Government’s highest technology award. In 2010, Mr. Brett advised the US Department of Interior as one of seven reviewers of the 30 Day Study immediately following the BP Gulf of Mexico Tragedy, and in 2011-2012 he served on the National Academy Committee to advise the US Bureau of Safety and Environmental Enforcement (BSEE), charged with evaluating the Effectiveness of Safety and Environmental Management Systems for Outer Continental Shelf Oil and Gas Operations. From 2015-2017, he served on the National Academy’s Gulf Research Program Advisory Board. Mr. Brett has authored or co-authored over 30 technical publications, and has been granted over 30 US and International patents - including several patents relating to elimination of ‘Drill Bit Whirl’ (which the Oil and Gas Journal Listed as one of the 100 most significant developments in the history of the petroleum industry). In 1999 the Society of Petroleum Engineers (SPE) named Mr. Brett as a SPE Distinguished Lecturer for his work served on the SPE International Board of Directors 2007 to 2010 where he served as Drilling and Completions Technical Director. Mr. Brett holds a BS in mechanical engineering and physics from Duke University as well as an MS in Engineering from Stanford University and an MBA from Oklahoma State University.

MR. LARRY K. BRITT is an engineering consultant with NSI Fracturing and President of Britt Rock Mechanics Laboratory at the University of Tulsa. Since joining NSI in early 1999, Larry has specialized in the development and application of tools for the post appraisal of hydraulic fracturing stimulations. Britt’s experience includes the optimization, design, and execution of fracture treatments in multiple geologic environments throughout the world. Prior to joining NSI he worked for Amoco Production Company for nearly twenty years. During the last six years with Amoco, he was fracturing team leader at Amoco’s Technology Center in Tulsa, Oklahoma, where he was charged with managing the development and application of fracturing technology for Amoco’s worldwide operations. Larry is the co-author of the SPE book “Design and Appraisal of Hydraulic Fractures,” Larry is a distinguished member of the SPE and has served on numerous SPE committees. Larry earned his BS degree in Chemical Engineering from the Colorado School of Mines and his MS degree in Petroleum Engineering from the University of Tulsa.

MR. ROBERT (BOB) BRUNE is a technology-oriented Geophysicist with wide ranging experience in E&P and reservoir expertise. He is a technology advisor for various companies including NSI Fracturing and President of Britt Rock Mechanics Laboratory at the University of Tulsa. His experience includes the development and use of technology, primarily in operational applications. He has worked at GSI, Amoco, USGS, Spho/BO, TGS-Nopce, and as a consultant. Bob’s responsibilities have been in Exploration, Production, and Technology. His positions have included: Manager, Technical Services and R&D, Exploration Manager, and Manager, Regional Field Development at Sohio/BO; and VP Operations, President Offshore, and Chief Geophysicist at Texaco. Bob has worked on a wide range of seismic acquisition projects in the U.S., China, Canada, Tibet, Indonesia, India, and the North Sea. Extensive work has also been carried out off the Caribbean, the Gulf of Mexico, and the Gulf of Guinea. Bob is also a member of the Academy of Mines and Metallurgy.

DR. MICHAEL BURIANYK is currently an independent geophysicist pursuing various projects in the field of Seismic Interpretation, reservoir characterization, and technical and research positions with a seismic contractor and later with Royal Dutch Shell. He has expertise in seismic Quantitative Interpretation (QI), non-seismic Geophysics, in the
development and application of geophysical technology and software; and experience in humanitarian applications of geophysics. He is a skilled and experienced oral and written communicator and has extensive experience in training, mentoring, managing, leadership and organization, intercultural communication and understanding. He is the author of Understanding Signals: Basic waveform analysis from a geophysical perspective published by SEG. He has a PhD in Seismology and Geophysics from the University of Alberta; and an MSc in Geophysics and Geology and a BSc in Physics and Geophysics from the University of Saskatchewan.

DR. ANDREW CHEN has worked with British Petroleum, AJM Petroleum Consultants, Schlumberger and other companies as a reservoir engineer and reserve evaluator, and has been responsible for operation reservoir engineering, oil and gas reserve and resource estimates, economical forecast and budgeting, acquisition and disposition, equity financing, and mid-stream supply studies. He also specializes in wireline formation test (WFT) design, data interpretation, and technical training. He has more than 20 years of petroleum engineering and teaching experience. During his tenure with Schlumberger Canada, he was responsible for providing a variety of reservoir engineering technical support, WFT technical/data interpretation practice including training of operators and clients, troubleshooting problem tests, and coordinating land and offshore projects for WFT. Mr. Chen has also provided consulting services in many Canadian and international companies in reservoir engineering, pressure transient analysis, and regional pressure data interpretation, with projects from Canada, the Gulf of Mexico, West Africa, Central Asia, Indonesia, Australia and PNG, and the North Sea. He also teaches an extensive and unique five-day wireline test interpretation course, 'Wireline Formation Testing and Interpretation' with OGCI/Petroskills in the industry worldwide, and frequently provides in-house practical wireline test interpretation and field workshops including his seminar in Southeast Asia on the comparison of wireline testing versus well test/DST, from technical and economical/financial parameters, to regulatory and operation considerations. He holds a PhD in fluid mechanics from the University of Manitoba, Winnipeg, Canada. Before that, he held an academic teaching position for six years in reservoir engineering.

DR. STEVE CHEUNG is the President of SteveIOR Consultants, and an Adjunct Associate Professor in Petroleum Engineering at the University of Southern California. He has over 35 years of experience in major oil company, academia and independent consulting. During his 30 years at Chevron, Dr. Cheung had both research and field experience in waterflood management, downhole remediation, formation damage, well stimulation, chemical EOR, well completions, oil field chemicals, reservoir characterization, and water shut-off. He taught in-house classes and troubleshooting oilfield problems around the world. He has received many SPE awards and recognitions, including Distinguished Lecturer (2006), Distinguished Member (2013), Distinguished Service Award (2016), and Regional Well Completions Optimization and Technology Award (2016). He is a member of SPE, AIChE, and several other associations. Dr. Cheung has chaired many SPE workshops, conferences and technical sessions. He holds an MS in Petroleum Engineering and a PhD in Chemistry from the University of Southern California and the University of California, Irvine, respectively.

MR. SATINDER CHOPRA, MSc, MPhil (Physics) has 27 years’ experience as a geophysicist specializing in processing, reprocessing, special processing and interactive interpretation of seismic data. He has rich experience in processing various types of data like VSP, well log data, seismic data, etc, as well as excellent communication skills, as evidenced by the several presentations and talks delivered and books, reports, and papers written. His research interests focus on techniques that are aimed at characterizing reservoirs. He has published 2 books and more than 140 papers and abstracts and likes to make presentations at any beckoning opportunity. His work and presentations have won several awards, the most notable ones being the CSEG Meritorious Service Award (2005), SEG Best Poster Award (2007), CSEG Best Luncheon Talk award (2007) and several others. He is a member of SEG, CSEG, CSPG, EAGE, AAPG, CGO (Canadian Heavy Oil Association), APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta) and TBP (Texas Board of Professional Geoscientists). Mr. Chopra holds a Masters of Philosophy in Physics (1978) and a Master’s of Science in Physics (1976).

MR. KEVIN CUYLER is the Director of Technical Division Operations at PetroSkills. He is also the Discipline Manager for the Multi-Discipline and Petroleum Business disciplines. Prior to this role, he was the Discipline Network Operations Manager where he was responsible for the ongoing health and operations of the nineteen discipline networks in the PetroSkills Alliance, ensuring competency map alignment, consulting on competency issues and assisting with member engagement and involvement. A member of SPE, Mr. Cuyler is the Course Director for the Drilling Fluids Technology course and an instructor for the Instructor Excellence Workshop at PetroSkills. Prior to joining PetroSkills, Mr. Cuyler had 17 years of experience with Halliburton Company including the HR Global Human Asset Manager for the Cementing Product Service Line, HR Business Partner, Global Technical Development Manager, Curriculum Development Manager, Division Technical Training Manager, Baroid Product Service Line Global Training Manager, Technical Services Manager, and Process Safety Manager. Prior to that, he was an Operating Representative and Mud Engineer. Mr. Cuyler has managed drilling fluids throughout Texas as well as deep-water operations in the Gulf of Mexico. Mr. Cuyler has a BS Degree in Wildlife and Fisheries Sciences from Texas A&M University in College Station, Texas.

DR. AKHIL DATTA-GUPTA is Professor and holder of the LeSuer endowed chair in Petroleum Engineering at Texas A&M University in College Station, Texas. He worked for BP Exploration/Research and the Lawrence Berkeley National Laboratory. He is the recipient of the 2009 John Franklin Carli Award of the Society of Petroleum Engineers for distinguished contribution in the application of engineering principles to petroleum development and recovery. Prior to that, he received the 2003 Lester C. Uren Award of the Society of Petroleum Engineers (SPE) for significant technical contributions in petroleum reservoir characterization and streamline-based flow simulation. Dr. Datta-Gupta is a SPE Distinguished Member (2001), Distinguished Lecturer (1999-2000), Distinguished Author (2000), and was selected as an outstanding Technical Editor (1996). He also received the SPE Cedric K. Ferguson Certificate twice (2000 and 2008) and the AIME Rissler W. Raymond Award (1992). He is also a co-founder of the SPE textbook Streamline Simulation: Theory and Practice. He received a Ph.D. degree from the University of Texas at Austin.

DR. MOJDEH DELSHAD is Research Associate Professor of Petroleum and Geosystems Engineering at the University of Texas at Austin. She has 20 years of experience in modeling multiphase flow, proper modeling, and reservoir simulation and more than 15 years of experience in modeling and designing subsurface contaminant transport and remediation processes. She has been involved in the design of several tracer and surfactant and surfactant/foam field tests using UTCHEM, The University of Texas chemical flooding oil reservoir simulator. She is also a co-author of the SPE textbook Streamline Simulation: Theory and Practice. She received a Ph.D. degree from the University of Texas at Austin.

DR. ISKANDER DIYASHEV is a director and a co-founder of Petroleum and Energy Technology Advisors, Inc., an engineering and consulting firm based in Houston, Texas, focused on drilling, completion and stimulation (www.1penta.com). Prior to that Dr. DIYASHEV was an officer and a board member with Independent Resource Development Corporation, based in Moscow with operations in Western Siberia. Dr. DIYASHEV was responsible for the planning of field development, reserves evaluation and addition, planning of exploration activities, as well as engineering and technology. In 2001-2006 Dr. DIYASHEV served as a Chief Engineer for Sibneft, one of the largest integrated oil companies in Russia with a daily production of 700,000 BOPD. During his career, Dr. DIYASHEV worked in R&D, consulting, and the service and production sides of the business both in Russia and internationally. Prior to his work with Sibneft, Dr. DIYASHEV was one of the key Schlumberger specialists to start the horizontal drilling project in Noyabrsk Western Siberia. He holds a PhD in Petroleum Engineering from Texas A&M University, and advanced degrees in Physics and Mathematics from Lomonosov Institute of Physics and Technology. He has authored 30 technical papers. Dr. DIYASHEV is a member of the Russian Academy of Natural Sciences, and served on the Board of Directors of the Society of Petroleum Engineers (SPE International), and on the boards of various private E&P, service and engineering firms in the petroleum industry. Twice in his career Dr. DIYASHEV was elected to serve as a Distinguished Lecturer of the SPE, in 2005-06, and in 2017-18.

DR. SHARI DUNN-NORMAN is a professor of Petroleum Engineering at Missouri University of Science and Technology with 35 years of industry and academic experience. She worked for Atlantic Richfield (ARCO) in domestic and international production operations, where she designed gas lift, reciprocating rod and electrical pump installations, in addition to managing construction projects and team building initiatives. She has almost 30 years of experience in reservoir characterization and streamline-based flow completions and well completions for more than 20 years and has conducted a wide range of research in pipeline well flow, well construction for the protection of US&DW’s, hydraulic fracturing and well completions. She has co-authored and edited the book, “Petroleum Well Construction”, and a number of papers related to well completions. Shari holds a BS degree in Petroleum Engineering from the University of Tulsa, and a PhD in Petroleum Engineering from Heriot-Watt University, Edinburgh, Scotland.

DR. AMR H. ELEWA has worked extensively in Oil and Gas exploration with multi-disciplinary teams for more than 23 years worldwide. He is a geological and geophysical studies team leader responsible for providing geological proficiency and support to all aspects of a company’s exploration and development activities. This includes organizing the exploration strategy for each fiscal year, quality control on the technical evaluation and integration of all technical data to provide assessments of prospectivity, reserves, risks and prospects ranking for different fields. He has a wide experience in operation geology, surface logging and petrophysical related work. In addition, Dr. ELEWA has been involved in education and training for many years with M.Sc. and Ph.D. students. He has been involved in the technical publications from a variety of international conferences. Dr. ELEWA holds a M.Sc in petrophysics and a Ph.D in petroleum geology from Cairo University.

DR. DALE FITZ has 36 years of experience as a petrophysist doing open-hole and cased-hole log interpretation and production logging in both exploration and production environments. He spent over 34 years working for ExxonMobil. About half of this time was spent doing research on shaly sand petrophysical methods, cased-hole nuclear logging techniques, and high-angle/horizontal well logging techniques. The remaining time was spent in various exploration and production departments including completion, production and technical. He has taught both offshore and onshore horizontal drilling programs and providing cased-hole nuclear and production logging support for difficult production challenges worldwide. During this time, he was heavily involved in developing and delivering training worldwide to ExxonMobil and affiliates on basic well logging, cased-hole nuclear logging, and production logging. Since retirement, Dale has been heavily involved in volunteer work for the Boy Scouts of America but has also been developing new training for cased-hole nuclear logging and production logging courses. He has a BS in Chemistry from Oklahoma State University and a PhD in Physical Chemistry from the University of Illinois. He held postdoctoral fellowships at the Max Planck Institut for Stromungsforschung in Gottingen, Germany and the University of Toronto, in Canada. He was also a visiting assistant professor in chemistry at the University of...
Houston. He has 27 publications in chemistry, 14 publications in the open-literature in petrophysics, and has numerous internal publications, memos, and training manuals with ExxonMobil. He is a member of the Society of Petrotechnicians and Well Log Analysts and the Society of Petroleum Engineers. At various times in the past he has served as an assistant editor for petrophysical publications for both of these professional societies.

MR. ERIC A. FOSTER is a Geoscience Technical Advisor with PetroSkills-OCC1 based in Houston. He has 40 years of operations and engineering experience as well as experience in the oil and gas industry. Prior to joining PetroSkills, he was with Landmark and responsible for managing geoscience and engineering consultants, representing geological, geophysical and petrophysical software applications and services for global operations. Starting as a geologist in field operations in the US, South America, North Sea, Trinidad and Mexico, he then worked as a training instructor and coordinator for worldwide operations at Core Laboratories in Dallas and subsequently moved to Calgary as Manager, Geological Operations. His background has included all aspects of formation evaluation and the application of software to geological and drilling engineering data acquisition and interpretation. He has acted as a technical advisor/consultant on projects throughout the world, and has extensive experience in the design and delivery of training programs. He was an instructor of petroleum technology at Mount Royal College and SAIT in Calgary and in-house for Amoco. He was nominated for the Distinguished Lecturer award by the AAPG and delivered a BC (Honors) in Geology, from the University of London, and he is a registered Professional Geologist and is a member of APEGGA, AAPG, SPE, HGS and SPWLA. He served as Publications Chairman and on symposium committees for the CWLS, he co-authored a paper on computer data formats (LAS) and has compiled numerous technical papers and training materials; he is a certified tutor for online learning.

MS. LAURA S. FOULK has over 25 years of business, customer service, geologic, interpretation, engineering, management, and sales experience in the oil and gas industry. After holding multiple positions at Schlumberger and Marathon Oil, she created Integrated GeoSolutions, Inc. to provide wellbore image interpretation and processing on image data from all vendors, and has been the company’s President since 2001. She specializes in reservoir characterization through integrating dipmeter and image data with core data, petrophysical data, seismic data, production data and engineering data, thus providing a better understanding of reservoir performance and potential. Her teaching experience includes courses in wellbore image theory and applications, and wellbore anisotropy measurements at Colorado School of Mines, Stanford University, and for internal clients. She also taught Wellbore Image Technology and Image Interpretation seminars for Marathon. She has numerous technical publications and her society affiliations include SPWLA, DLWS, AAPG, RMAG, and SEPM. She received an MS in Geology from Colorado School of Mines and a BSE in Mechanical Engineering, Geology from Duke University.

DR. CHRISS GALAS 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 predictions from simulation were close to actual field performance. He holds a BA from Cambridge University, an MSc from London University, and a PhD from the University of Calgary, all in Physics. Chris is a registered Professional Engineer in Alberta, Canada.

MR. RAFAEL GAY-DE-MONTELLA is a Chemist and Chemical Engineer with 30+ years of experience. He is skilled in process engineering consulting, design in plant operations, teaching and training of professionals and operators, and has been active in the development of new technologies. His 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 Cyclic Steam Stimulation (CSS) extraction of Heavy Oil produced water recovery process design. Rafael is knowledgeable in simulating corrosion conditions and H₂S-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 fracking waters and is proficient in using OL, ROSA, and other CA modeling tools as well as extensive experience in MEE, and MVC evaporators. He has also worked with several high to low pressure steam boilers and has designed steam systems for complete mills and refineries.

DR. ALI GHALAMBOR (now retired) was the American Petroleum Institute Endowed Professor and Head of the Department of Petroleum Engineering and Director of Energy Institute 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, professional organizations, and the United Nations. Dr. Ghalambor has 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 SPE Distinguished Achievement Award, the SPE Louisiana State Section Outstanding 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 Commissioner on the Engineering Accreditation Commission of 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, Chair of the Reservoir Engineering Section, Chair of the Environmental Engineering Committee, and Chair 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 of experience in production, completions, and well integrity issues from oil and gas fields all over the world. After working as a roughneck and roustabout through college, he started his professional life as a facility engineer in Alaska. He has worked his way through the value stream from facilities to completions with jobs in Anchorage, Denver, Houston, Gabon, Congo, Egypt, Scotland, Russia, and Australia. He is currently a consulting engineer, working on completions and well integrity problems for a wide range of independents and majors. He has worked as a Wells Technical Authority for a large international independent with a varied portfolio of offshore oil and gas wells. He was the first Senior Completion Advisor for a super major. As part of this role, he worked with teams on both major technical incidents and on planning and assurance of high profile projects around the world. These experiences have given him a unique viewpoint of how fields are developed; how wells are designed, constructed, and produced; how things can go wrong with a well during construction and production; and how best to mitigate and manage well problems. He has authored and co-authored a number of papers, ranging from polymer flood management to ice mechanics and most recently a design of an innovative ICD system for a high rate water injection well. Dan graduated from Oklahoma State University, Stillwater and Studied Arctic Engineering at the University of Alaska, Anchorage. His teaching specialties include first principle reservoir engineering developing an understanding of why things happen which then dictates an appropriate response.

MR. CURTIS L. GOLIKE is an Independent Petroleum Engineering consultant operating out of Golden, Colorado. In addition to his consulting business, James Peak, he acts as the Managing Director of two US prospect generating companies, Emerald Peak Associates and Low Capex Reserves. He has 42 years’ experience working for three global oil and gas companies. His specific contributions are in the areas of revitalizing old fields, remote and start-up operations, petroleum economics, and introducing new reservoir management technologies internationally. His personal skills are in team development, specifically operational and cross cultural project teams of industry professionals. He is a registered Professional Engineer in the States of Texas and Colorado. He received a Bachelor’s Degree in Petroleum Engineering from Colorado School of Mines, and an Executive MBA from UCLA Business School.

MR. MASON GOMEZ is a Licensed Petroleum Engineer (LA#26131) with 30 years diversified experience including production/reservoir/drilling engineering, offshore field development/mature field optimization, unconventional drilling/ completions, operator/service company perspectives, engineering, sales, operations management, human resource development, and project management roles. He received a BS degree in Petroleum Engineering from Stanford University. Within PetroSkills, he teaches 8 courses across the Spectrums, Reservoir, and Drilling disciplines, and helps support the overall organization as VP, Learning.

DR. G. MICHAEL GRAMMER is a Full Professor and holds the Chesapeake Energy (endowed) Chair of Petroleum Geology at Oklahoma State University. Dr. Grammer received his PhD in 1991 at the University of Miami’s Rosenstiel School of Marine and Atmospheric Science and has over 25 years of industry-related experience in carbonate reservoirs, sequence stratigraphy and carbonate reservoir characterization. His current research interests involve the various aspects of high resolution sequence stratigraphy and its application to carbonate reservoir characterization, 3-D modeling and petrophysical characterization. He has been an AAPG Distinguished Lecturer (2002-2003) and has led several AAPG field courses, including AAPG’s modern carbonate course entitled ‘Sequence Stratigraphy and Reservoir Distribution in a Modern Carbonate Platform, Bahamas’ which he co-led for 14 years. Dr. Grammer has published nearly 100 technical articles on carbonate reservoir characterization issues, including as lead editor of AAPG Memoir 80 ‘Integration of Outcrop and Modern Analogos in Reservoir Modeling’ which won AAPG’s Robert H. Dott Sr. Memorial Award for best special publication in 2006. Dr. Grammer’s industry-related experience includes senior research positions with Texaco and ChevronTexaco where he functioned as an internal consultant and instructor on carbonate reservoir characterization issues in various parts of the world, most notably with super-giant fields in Kazakhstan. Dr. Grammer has consulted, presented short courses and led field trips for numerous multi-national companies.
DR. JAMES W. GRANATH is a consulting structural geologist based in Denver, Colorado, who has worked in academia as well as the minerals and petroleum industries. Since 1976 he has taught at SUNY Stony Brook and spent 18 years in Conoco in research, international exploration, and new ventures. In 1999 he opened a consulting practice focused on structural geology and tectonics as applied to exploration problems, interrupted only by brief periods of work with Forest Oil and Midland Valley Exploration in Denver. He is a member of AAPG, AGU, GSA, and RMAG, and is a certified petroleum geologist (#5512) and a Texas Professional Geologist (#733). He is the author of numerous research papers and co-edited several multi-author compendia. His expertise lies in seismic interpretation and integration with structural analysis, fracture analysis, and regional tectonics. He has studied and worked in many producing basins around the world. He holds his PhD from Monash University in Australia, and a BS and MS from University of Illinois at Champaign-Urbana.

MR. MARK HACKLER is currently serving as the Houston Regional Director for Files & Associates. He has more than 32 years of work experience. His technical background and work experience qualify him as an expert in the areas drilling project management, project planning and engineering practices. Areas of particular interest, education, and research include project management, organizational learning, process improvement and engineering services. He has served in roles from a Project Drilling Engineer to a Project Manager, Responsibilities include project management and utilizing engineering service efforts for domestic and international energy organizations. His experience includes implementing project management and organizational learning efforts for projects and teams by developing and evaluating work processes to manage and improve performance. Additionally he has been responsible for delivering over 50 well construction training courses and over 300 operational drilling workshops. Mr. Hackler has also managed full implementations of corporate well construction and planning processes. Additional experience includes well planning, operations and post analysis and improvement efforts for projects in Australia, Papua New Guinea, China, Angola, Peru, Brazil, Columbia and Venezuela. Most recent experience has included well planning and operational support for both conventional and horizontal drilling programs. Mr. Hackler has been a member of the Society of Petroleum Engineers (SPE) since 1983 and is also a member of the Petroleum Management Institute (PMI). Mr. Hackler holds a BS degree in Petroleum Engineering & Technology from Oklahoma State University.

MR. ROGER HADDAD. PE, PMP, is a practicing project manager with Occidental Petroleum and has over 25 years of design and project experience in the Oil and Gas and Chemical Industries. He started his career as a structural engineer and progressed from design to construction to project management. He gained his project management skills while working on fast-track projects in North America where he held various positions in project and portfolio management. For the last 10 years, Roger has been managing large offshore and onshore oil and gas projects in the Middle East. With his experience in project delivery and project controls, he has been managing large project teams and contractors and working with JV partners as well as national oil companies. Roger earned a MS in Structural Engineering and a BS in Civil Engineering from the University of Buffalo, New York. He is currently based in Abu Dhabi, United Arab Emirates.

MR. ROGER HADDAD, PE, PMP, is a consulting project manager with Occidental Petroleum and has over 25 years of design and project experience in the Oil and Gas and Chemical Industries. He started his career as a structural engineer and progressed from design to construction to project management. He gained his project management skills while working on fast-track projects in North America where he held various positions in project and portfolio management. For the last 10 years, Roger has been managing large offshore and onshore oil and gas projects in the Middle East. With his experience in project delivery and project controls, he has been managing large project teams and contractors and working with JV partners as well as national oil companies. Roger earned a MS in Structural Engineering and a BS in Civil Engineering from the University of Buffalo, New York. He is currently based in Abu Dhabi, United Arab Emirates.

MR. RICHARD HENRY has ten years management experience of multidisciplinary teams including construction projects, JIT manufacturing, and (petroleum) field audits. He has twenty-five years reservoir engineering experience including simulation, field management and reserves certification, and forty years’ experience in programming, software engineering, and information technology. He holds a BSc Industrial Engineering (Honors, 1987) and a MSc in Petroleum Engineering from the University of the West Indies, St. Augustine, Trinidad (1997). He is a graduate of Texaco’s elite (30 candidates selected worldwide) and intensive (6 month) reservoir management training program (1998).

MR. RON HINN is the EVP for Sales and Member Engagement for PetroSkills. He is a people oriented manager, possessing strong leadership and communication skills. A registered professional engineer, Ron’s 39-year career has spanned numerous roles including staff engineering, engineering supervision, corporate knowledge management, and professional staffing and competency development. Ron is an active supporter of global engineering accreditation activities, having served in multiple roles for ABET up to and including Executive Committee of the ABET Board. Ron received a BS degree from the University of Tulsa in petroleum engineering.

MR. ALAN HIPPMAN, CEng, FIMechE, IntPE(UK), SPE, is a resident of Colombia, having lived in Vietnam, UK, USA, Congo, Canada, Trinidad, Botswana, Singapore, and Germany and worked in many other countries. Following a mining engineering contract in Botswana, he started in the oil and gas industry in the North Sea in 1975 gaining service as an engineer on the North Sea Oilfield Services and Oil. In 1981 Al joined Dome Petroleum in Canada and gained experience in the Beaufort Sea, East Coast, and in Western Canada onshore. In 1988 Dome Petroleum merged into Amoco and Al worked in a global role from Houston, and in country-based roles in Congo, USA/China, and UK/Norway/Netherlands. In 1999, Amoco merged into BP Amoco (later BP) and Alan had several roles ranging from Algeria Wells Manager to Head of Drilling and Completions to Wells Director. Alan spent a number of years with Eni and has been a Consultant and Instructor, as well as taking time for travel, both associated with consulting/instructing assignments worldwide, and on major overland trips to South America and Africa. Mr. Hippman has a degree in Management Studies in the Global Enterprise Program from the Thunderbird Graduate School in International Management in Phoenix, Arizona, USA; and an Associateship in Mechanical Engineering and an Industrial Administration A&B degree both from Robert Gordon University, Scotland.

MR. W. GREG HAZLETT is an instructor and part owner of PetroSkills, and President of W. G. Hazlett & Assoc. LLC. As Vice President of PetroSkills, he designed competency-based training programs, evaluated course materials and instructors, taught training courses, and consulted on technical issues. Prior to joining PetroSkills, Dr. Hazlett was Vice President of Gemini Solutions, Inc., where he was in charge of the petroleum and geological engineering consulting group. Dr. Hazlett 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 South Carolina, and unconventional tight gas sands. He has also 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 on petroleum engineering topics, served as SPE coordinator for the Reservoir Engineering, Gas Technology, and Fluid Mechanics and Oil Recovery Processes committees, and has testified as an expert witness. Dr. Hazlett has BS, MS and PhD degrees in petroleum engineering from Texas A&M University and is a registered Professional Engineer in Texas.

MR. JEFF HAMMAN consults on subsurface characterization and provides training and technical mentoring. He has 40 years of experience with Gulf, Chevron, Marathon, and BP before creating his own LLC. As a member of production teams, he provided characterization of most reservoir types across the major basins of the globe. A substantial portion of his career has been devoted to technology development and delivery in the areas of reservoir petrophysics, seismic reservoir characterization, and subsurface integration. Most of the last 15 years was devoted to leading and building teams and the extremely gratifying mentoring and development of people. He remains active in the SPE and SPWLA, has coauthored more than 30 papers and 2 patents, held professional registrations in petroleum engineering and geoscience, and received the SPE Gulf Coast Formation Evaluation Award. Jeff has a BS in Geology from LSU and an ME in Petroleum Engineering from Tulane University.

MR. LARRY HARMS is a production optimization specialist at his consulting company, Optimization Harmsway LLC, established after a 38-year career with ConocoPhillips. At ConocoPhillips he specialized in holistic production optimization and was a leader of the Artificial Lift Network for 10 years. He has held a number of key positions with Dubai Petroleum Company for 3 years. Larry has served on the Board of Directors of the Artificial Lift Research and Development Council since 2008. He has written/co-authored 11 SPE papers on topics ranging from the application of artificial lift, velocity strings and compression to integrated production modeling and real time optimization. Larry has conducted training courses for hundreds of industry and ConocoPhillips engineering, operations, and maintenance personnel on artificial lift, compression, production optimization, systems nodal analysis, integrated production modeling, and gas well depletion. He received a BS in Chemical Engineering from Oklahoma State University.

MR. ANDREW HARPER is a petroleum geologist with 32 years of international exploration and development experience, including 21 years with ARCO. He has experience in the North Sea, the Middle East, China, Indonesia, Chile, Ecuador, Peru, Colombia, US Rocky Mts., and the Alaska North Slope. Since 2001, he has worked with MI Energy Corp on three oil field development projects located onshore NE China. He received a BA in Geology from Williams College and an MS in Geological Sciences from the University of Southern California.

DR. JAMES LEE HANER is the head of Ultimate Business Resources (UBR) Consulting, specializing in “Building Better Businesses.” UBR is an independent firm offering business consulting and project management services to Fortune 500 companies in the US, Europe, Africa, and China. James has more than 30 years of experience in business and IT. His responsibilities have included establishing a corporate web presence for a Fortune 500 company, creating a successful organization-wide employee development plan, and developing the IT infrastructure for a start-up company in both project management and leadership roles. He completed his PhD work at the University of Idaho and Corllins University. He earned an MA degree in Management/Leadership from the Claremont Graduate School and took classes with Peter F. Drucker, “the father of modern management.” James is a contributing author of 140 Project Management Tips in 140 Words or Less, 2010: Making Sense of Sustainability in Project Management, 2011; and Program Management: A Lifecycle Approach (2012).

DR. CHUN HUH is a well-known expert in process modeling, EOR simulator development, and the use of reservoir simulation software. Huh earned a BS degree for petroleum engineering at Yonsei University in South Korea, an MS degree in petroleum engineering at Texas A&M University, and a PhD degree from Seoul National University and a PhD from the University of Minnesota, both in chemical engineering.

MR. STEPHEN JEWELL is an independent oil and gas consultant and advisor with 30 years’ experience in the upstream sector. He was previously the Managing Director and co-founder of Xodus Subsurface Ltd, the Wells and Subsurface company within the Xodus Group of technical consultants. He was also Chief Operating Officer and a founding shareholder of...
Composite Energy Limited, a European Unconventional Gas company, growing the company from seed capital of $500k to an ultimate sale value of over $60 million in 5 years. He has over 16 years’ experience with Amerada Hess starting as petroleum engineer and progressing to Acting General Manager of its North Sea Operations Base. He received a BEng (Honors) degree in Electronic Engineering from the University of Sheffield and speaks Norwegian and French.

DR. MOKEN G. KELKAR is a professor of petroleum engineering at the University of Tulsa in Tulsa, Oklahoma. His main research interests include reservoir characterization, production optimization, and risk analysis. He is involved in several research projects, which are partially funded by various national and international sponsors. He has published over 200 technical papers, and he has been a consultant to many oil companies, as well as to the United Nations. He received a B.S. in Chemical Engineering from the University of Bombay, an M.S. in Petroleum Engineering and a Ph.D. in Chemical Engineering from the University of Pittsburgh, and a J.D. from the University of Tulsa.

MR. BILL KEMP has 40 years of oil and gas industry experience in engineering, operations, product development and commercialization, business development, sales, gas marketing. Bill is responsible for strategic member/client interaction in workforce development, consulting and software solutions in the upstream, midstream and downstream segments. Previously, Bill was manager, sales and marketing, for the Oilfield Technology Group of Hexion in Houston, beginning in 2004. At Hexion Bill was responsible for new stimulation technology commercialization as well as managing strategic relationships with customers and industry organizations. He began his career with Halliburton in 1977 as an engineer-training. He had numerous field experience in the Petroleum Geology industry, including research, exploration and production geology, sedimentology and petroleum engineering. He also has wide experience in delivering technical presentations, consulting and technical literature and was the Chairman of the National SPE Reservoir Characterization and Modelling and Basin Analysis. He has authored or co-authored many technical publications, membership several professional societies and organized numerous conferences for artificial lift. He played a major role in organizing the Denver Gas Well De-Watering forum, which is continuing after multiple successful occurrences. He has authored or co-authored: the book “Deliquification of Gas Wells” (“Elesiev”), the chapter of the new SPE productions Handbook on Artificial Lift Selection and other book chapters, as well as over 60 technical papers and articles on artificial lift systems. He received the SPE Production Engineering Award in 1996 and was the recipient of the 1990 J. C. Stinnett Award from SWPSC, Lubbock, Texas, given to individuals who have made outstanding contributions in the field of petroleum engineering. He is a Registered PE in Texas, has 9 US patents, and received a BSME and MSME in Mechanical Engineering from the University of Arkansas and a PhD from Southern Methodist University.

MR. JEFFREY (JEFF) LELEK has over 33 years’ experience in the Petroleum industry. He was with various companies in the petroleum industry and was involved in consulting on flowing/lifting wells, testing, and research on lift methods, creating new computer programs for lifting and flowing wells, teaching production schools and monitoring JIPs on pipeline flow, artificial lift, erosion, corrosion, and others. He is an expert on SPE committees for electrical submersible pumps, gas lift, and artificial lift systems, and is a member of the panel for the ESP roundtable. He has been an SPE Distinguished Lecturer two times and has presented and organized numerous conferences for artificial lift. He played a major role in organizing the Denver Gas Well De-Watering forum, which is continuing after multiple successful occurrences. He has authored or co-authored: the book “Deliquification of Gas Wells” (“Elesiev”), the chapter of the new SPE productions Handbook on Artificial Lift Selection and other book chapters, as well as over 65 technical papers and articles on artificial lift systems. He received the SPE Production Engineering Award in 1996 and was the recipient of the 1990 J. C. Stinnett Award from SWPSC, Lubbock, Texas, given to individuals who have made outstanding contributions in the field of petroleum engineering. He is a Registered PE in Texas, has 9 US patents, and received a BSME and MSME in Mechanical Engineering from the University of Arkansas and a PhD from Southern Methodist University.

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MR. LARRY LENs has over 41 years of experience in the petroleum industry working for Amoco and BP (33 years) and then for PetroSkills (6 years), as well as now working with the Denver Museum of Nature and Science as a Research Associate doing fieldwork and research on the Permian-Triassic rocks of Wyoming. He was lead geologist for the North American Natural Gas Production, working in the Texas Gulf Coast and West Texas regions in the United States. He later expanded into the international arena working Gabon and Congo after which he became Amoco’s Regional Geologist for Africa and Middle East. He was Country Manager in Ghana, Consulting Geologist in New Orleans (where Amoco successfully piloted the first application of multi-disciplinary teams) and then Geology Discipline Manager (Chief Geologist) for Amoco’s Worldwide Exploration Group. Mr. Lens later transferred to Denver to build a new exploration team to help increase Amoco’s North American natural gas production later returning to the international arena as Relationship Manager/Government and Public Affairs Manager working Angola out of Houston and London. Mr. Lens then focused on an area that he felt passionate about. He took on the role of Technical Learning and Development Manager for BP E&P globally. This took him to work on the Training and Education strategy which was a part of BP’s commitment to gain entry into Libya. He led BP’s Education and Training projects in Libya for the Government of Tripoli, Libya which had considerable success having both an external focus on relation to BP’s Training & Education commitment with the National Oil Corporation of Libya as well as an internal focus on training and development within BP. Mr. Lens also had a leading role in establishing and managing the BP Libya Trainee and Scholarship programs. These programs were tailored to be totally immersed with BP’s E&P early development program called the Challenge Program. After retiring from BP in late 2003, Mr. Lens took on a leading role in developing the PetroSkills Accelerated Development Programs across all the E&P Disciplines, having seen this as a need in the oil and gas industry. Larry has a MS degree from the University of Georgia and a BS degree from the University of Michigan both in Geology.

MR. ROBERT (BOB) G. Lippincott is an Employee Development Consultant with extensive oil and gas exploration and production experience including technical training and petroleum engineering. He is well versed and knowledgeable on petrophysical tools and petroleum technology. Bob is an experienced course director and lecturer for petrophysical and Tubing/Well Intervention Engineer, then for BP/Equion Energia in the giant Kashagan offshore project in the Caspian Sea as Coiled Tubing/Well Interven. He has expanded his experience yet again to the UTG and UTG Energy in Colombia as a Senior Well Interventions Engineer consultant. For the past two years, he has worked in UAE and Saudi Arabia. Mr. Lippincott has been a well Interventions instructor for the past six years, and has also been an IWCF Well Interventions certified instructor in the past.

MR. DIEGO LONDONO is a Petroleum Engineer with over 19 years of experience in rigsless well interventions acquired while working with major Services and E&P companies different locations throughout the world. His experience includes coiled tubing interventions, stimulation operations, slick/braided line and electric line interventions, hydraulic fracturing and production testing. Mr. Londono started his career working for Halliburton as a Simulation and Coiled Tubing Field Engineer, then for BP as Well Interventions Engineer/ Company Man in rigsless well interventions. He worked for ENI in the giant Kashagan offshore project in the Caspian Sea as Coiled Tubing/Well Intervent. He then expanded his experience for BP/Equion Energia in Colombia as a Senior Well Interventions Engineer consultant. For the past two years, he has worked in UAE and Saudi Arabia. Mr. Londono has been a Well Interventions instructor for the past six years, and has also been an IWCF Well Interventions certified instructor in the past.

MR. PERRY LOVELACE CMRP, is a Senior Instructor/ Consultant for Pathfinder Learning Solutions LLC. He specializes in Maintenance Management and Competency-based Training Programs and has over 35 years’ experience in industrial training and consulting. After graduate studies, he worked for a large consulting mechanical/electrical engineering firm applying rigorous systems analysis to industrial facility design and construction. He has combined his consulting experiences with his learning experiences, keeping in tune with the changing economic and technological environment, especially as applied to long-term facilities and equipment management. He has assisted many organizations through on-site consultation and training. Clients include petroleum, industrial and utility organizations of different types and sizes in the United States, Kingdom of Saudi Arabia, United Arab Emirates, Qatar, Nigeria, Angola, Canada, New Zealand, Australia, Thailand, Malaysia, Singapore, Trinidad/ Tobago, UK, Romania, Austria and Mexico. An engaging and popular speaker/facilitator, Mr. Lovelace continually receives high marks from participants. A CMRP member of the Society for Maintenance and Reliability Professionals, Mr. Lovelace holds a BS in Science Education and an MS in Botany from the University of Oklahoma, with pre-doctoral studies in Plant Ecology at the University of California. In March 2016, Mr. Lovelace was inducted into the University of Oklahoma, College of Education Hall of Fame for his 50 years of innovative education and outstanding teaching.

MR. PETE LUAN has over 25 years of international upstream project management experience. He has also consulted for the past 10 years on their management of capital projects. He has an extensive track record of helping E&P companies improve their capital project performance. He has been particularly successful with those clients who are faced with large capital projects and require a step-change in organizational capabilities. Pete is a facilitator and advisor to top management, many of whom continue to seek his advice even after the development of their project organizations has been completed. He has worked with numerous strategy, project execution plan development, risk management, Lessons Learned, stakeholder alignment, etc. Pete worked for Amoco Production Co. managing major capital projects in Azerbaijan, the Middle East, and Latin America. He holds a BS and an MS in Mechanical Engineering with higher honors from Rice University and has completed management training at Harvard Business School. He is PMP certified.

MR. CHRISTIANA LUCA is associate partner in Community Wisdom Partners, a consultancy specialized in the creation of mutually beneficial relationships between business and societal actors. He has 32 years prior experience in the oil and gas industry with Shell starting as a petroleum engineer in various countries around the world before moving into senior corporate positions in technical and commercial strategy. In his latest role he was responsible for the design and implementation of Shell’s global practice in non-technical (or societal) risk management. This included training hundreds of advisors, engineers, managers, and executives in the practicalities of delivering a timely and proactive response to pressures and challenges from the external world. His experience across technical, commercial, and non-technical disciplines allows him to communicate easily across all professional boundaries. Christiana has a broad toolkit at his disposal to improve governance, streamline processes, and create the cultural change needed for proactive management of non-technical risks in capital projects and operations. He has a BSc in Mining Engineering and a MSc in Petroleum Engineering (Honors), both from Delft University of Technology in The Netherlands.

MR. KEN LUNS Ford is the Project Management Discipline Manager for PetroSkills. He has more than 38 years’ experience in engineering and management of oil, gas, chemicals and plastics development. During his 32 years with ConocoPhillips, he led development teams on projects in the United States, Norway, Qatar, and United Arab Emirates. His diverse engineering and project management background includes sour gas plants, oil, gas and petrochemical pipelines, engineered plastics processes and materials handling, batch sulfur chemical processes, liquefied natural gas projects and pilot plants. Additionally, he was corporate project controls manager for Phillips Petroleum with responsibility for developing business processes, tools and practices, project controls consulting, and project controls training. Mr. Lunsford has over 35 years' experience in industrial training practices, project controls, contracting strategy, risk management, reviews and assists and joint venture non-operated project assurance. He received his BS and MS degrees in Mechanical Engineering from the University of Missouri-Columbia. He is a registered professional engineer in the State of Texas.

DR. HELOI S LYNN specializes in the expression and use of anisotropy in multi-dimensional datasets (multi-azimuth, multi-component, and time lapse), 3D azimuthal seismic acquisition design, azimuthal seismic processing, and azimuthal seismic interpretation. As a geophysicist in the oil and gas industry since 1975, she is knowledgeable about seismic reflection data acquisition, processing, and interpretation, and how anisotropy affects these endeavors. Her industry work during the last 44 years has also included use of VSP (vertical seismic profile data), wireline log data, lab data, core data reports, microseismic, production data, and other support data from engineers, geologists, and petrophysicists. She offers clients library searches for suitable seismic data for sale, acquisition design for new 3D seismic, supervision of re-processing said data for specific client goals (via the best contractor for the job), and interpretation to establish commercial hydrocarbon production. More information at www.Lynn-inc.com. Heloise holds a PhD in Geophysics and an MS in Exploration Geophysics from Stanford University, and a BA in Geology from Bowdoin College in Brunswick, Maine.

DR. WALTER S. LYNN has over 33 years’ experience in the oil and gas industry specializing in seismic data processing and software development. During the 1980’s, he worked with the R&D Department at Western Geophysical helping to solve acquisition and data processing problems associated with the explosive growth of 3D seismic exploration. During the 1990’s, Walt oversaw the technical development for a large seismic contractor and later took over as President of PGS Data Processing. After leaving PGS in 2002, Walt has continued his true passion - applied geophysical research and teaching. His multi-faceted experience over his career has involved him in geophysical problems in areas throughout the world. For the past decade, he has concentrated on the geophysical challenges associated with unconventional reservoir. He received a Ph.D in Geophysics from Stanford University, an M.S. in Geophysics from Oregon State University and an A.B. in Geology and Geophysics from Princeton.

MR. JOHN MARTINEZ has 50 years’ experience in oil field production technology with a specialty in production facility revision and artificial lift operations, with extensive expertise in gas lift. This includes well deliverability, transient pressure testing, and elast...
MS. RANDI MARTINSEN is a certified petroleum geologist with 40 years of experience (domestic and international) working in industry. A registered Professional Engineer in Texas, she receives an MS and BS in Mechanical Engineering from the University of Texas.

MR. STEVE METCALF has worked in the petroleum industry for approximately 40 years in both service and operating companies in Texas and Oklahoma. Within his career, he held various research and engineering positions, including 11 years in Acid Research. With Baker Hughes, he held the position of Senior Engineering Advisor with a primary focus in Production Geosciences. Currently, he is a part of a best of AAPG session. He has been an instructor for new geoscientists at the Houston Geological Society, and selected to present at SEG as a coauthor (of the AAPG Bernold M. "Bruno" Hanson DEG Excellence of Presentation award). He is the founder and is the President of the American Association of Petroleum Geologists (AAPG).

DR. DR. GARY L. MASSINGILL has 35 years of industry experience as a geologist with a mixed background that includes research, exploration and production of uranium, natural uranium, conventional oil and gas and unconventional resources, both oil and sand source shale plays. He has worked for Marathon Oil, Western Oil & Sand, and Cambridge Mineral Resources, Newmont Mining, Santa Fe Pacific Gold, Blazer Oil and Gas, Exxon, US Steel and New Mexico Bureau of Mines and Mineral Resources. Generally, his focus has been applied exploration, but his primary disciplines have been previously considered at times as a sedimentologist, structural geologist or researcher. He has served as the Director, Chief Geologist and President of companies. His entrepreneurial spirit is still active and he is currently involved in several ventures primarily focused on the development of oil and sand resources. He has a BS and MS from West Texas State University and a PhD from the University of Texas at El Paso.

DR. MARK A. MCCAFFREY received his BA (1985) from Harvard University, magna cum laude with highest honors in geology and chemistry, and an MS in oceanography (in the area of organic geochemistry) from the Massachusetts Institute of Technology/ Woods Hole Oceanographic Institution Joint Program. Mark spent 10 years at Chevron and Arco as a petroleum geologist, then founded OilTracers LLC. After 10 years, OilTracers was acquired by Weatherford. Mark is a California Registered Geologist (License #5903), a Texas Professional Geoscientist (Geology, License #350), a Louisiana Professional Geoscientist (License #2364), and an AAPG Certified Petroleum Geologist (Certificate #5339). He is author of numerous articles on the application of geochemistry. As an expert witness in gas fingering, he has testified (i) in Mississippi State Court, (ii) in Ohio Federal Court, (iii) before the Oklahoma Corporation Commission, (iv) before the Railroad Commission of Texas, and (v) before the Louisiana Department of Natural Resources Office of Conservation. Mark received the 1995 Pieter Schenck Award from the European Association of Organic Geochemists for “outstanding work on biomarkers in Arctic and paleoenvironmental studies and petroleum exploration.” In 1998, with project team members, Mark received the Arco Award of Excellence “for developing a new change and migration model for the Brookian petroleum system, allowing improved charge risk assessment for prospects on the Central North Slope of Alaska.” Mark was a 2001-2002 Distinguished Lecturer for the Society of Petroleum Engineers. He was the 2014 recipient (as coauthor) of the AAPG Energy Minerals Division President’s Certificate for Excellence in Oral Presentation and was the 2015 recipient (as coauthor) of the AAPG Bernard M. ”Bruno” Hansen DEG Excellence of Presentation award.

MR. DAVE MCGEE has worked in many of the world’s shelf and deepwater plays for 32 years on projects including exploration through development. He is experienced in all phases of clastic plays life cycles resulting in a rounded perspective that can come to bear on any project. A majority of his experience is in deep water development. He received a BS degree in development geology. He has worked on most of the major deepwater basins around the globe. He has recently been working on conventional and unconventional plays in the Neuquén, Arkoma, Permian, North Sea, and West African basins as a seismic stratigrapher and regional geologist. Mr. McGee is experienced in the application of technology to problems for maximum benefit including: 1) seismic stratigraphy; 2) Landmark, Statmaxic, GeoProbe, VoxelGeo, TerraSpark, GeoFfer, Petrel, and Shell seismic interpretation, including attribute analysis and image processing for exploration and development projects; 3) acoustic impedance inversion for reservoir-scale reservoir architecture and pay prediction; 4) structural reconstruction software for fault geometries and trap analysis; 5) gravity modeling; 6) EarthVision, Roxar, Petrel, and Shell reservoir modeling software to integrate data and build static reservoir models for deepwater fields/discoveries; 7) ArcGIS tools for mapping and data integration; and 8) decision analysis techniques to determine optimal minibasin scale exploration/development strategies and well planning decisions. He is currently working on integrated teams of geologists, geophysicists and engineers that were empowered to make decisions and were accountable for results. He served as team leader and/or lead geologist for four of these teams utilizing effective team/leadership skills working on a variety of scales and problems. He has received best paper presentation awards from the New Orleans Geological Society, runner-up for best paper at the Houston Geological Society, and selected to present at SEG as a coauthor (of the AAPG Bernold M. "Bruno" Hanson DEG Excellence of Presentation award). He was named mentor of the year from ConocoPhilips in 2009. Mr. McGee has an MS in Geology with Honors from the University of Oklahoma and a BS in Geology with Honors from the University of Montana.

DR. HOWARD L. MCKINZIE is a petroleum consultant from Sugar Land, Texas. His prior industry experience includes 21 years with Texaco, Inc. and Getty Oil Company in numerous areas of production and completions engineering. Specific specialties include sand control, downhole oil/water separation, compact surface oil/water separation, artificial lift with progressive cavity pumps, formation damage, water shut off, drag reductions and fluid flow, and well stimulation by acidizing and fracturing. He also worked in the area of surface well logging, and was one of the co-developers of QGM (Qualitative Gas Measurement) and QFT (Qualitative Fluorescence Technique). Prior to joining Getty, he was employed by GTE Labs in Waltham, Massachusetts, where he worked primarily in the areas of catalyst development research and developing photo-catalytic techniques. He was the Chairman of the Completion Engineering Association in 1991-1992, after being Vice Chairman in 1989-1990. He was a member of the research team that received the Special Meritorious Award for Engineering Innovation from Petroleum Engineer International (1999). He was also a member of another team that received the Hearst Newspapers Energy Award for Technology in 1998. He has twice received Texaco’s Corporate Technology Innovation Award and holds numerous patents in several of the above areas. He held a post-doctoral appointment in Chemistry at Brown University, and subsequently taught engineering several more years at Brown. He has also been active in various research and engineering positions, including 11 years in Chemistry and Mathematics from Central Oklahoma University, and a PhD in Physical Chemistry from Arizona State University.

MR. TIMOTHY MCMAHON is the founder and Principal Geoscientist with Cutlass Exploration, LLC, a Katy-based prospecting and petroleum consulting firm. He has 21 years’ experience in the oil and gas industry. During ten years with ConocoPhillips he worked as an exploration geoscientist or exploration supervisor in Malaysia (offshore Sabah), Norway (Atlantic Margins) and Houston (Deepwater GOM and Global New Ventures Exploration). Previous positions included Burlington Resources Technology Enhancement Team working in GOM, Wyoming, Canada, China, and Ecuador, and as a trainer and consultant with Landmark Graphics. Timothy is a self-motivated geoscientist with strong technical skills and exposure to a wide variety of geologic settings both in the US and internationally. He has extensive experience in basin-scale data analysis, 2D and 3D reservoir characterization and reservoir modeling; integrated geologic mapping and volumetric/risk analysis. Strengths include adaptability, passion for continued learning and a strong work ethic. Timothy received his PhD in Geosciences from University of Texas at Austin, his MS in Geology from New Mexico State University, and his BA in Geology from Rutgers University.

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 in mapping the complex structures of the Idaho-Wyoming- Utah Thrust Belt. Seismic quality in thrust belts is often fair or poor, making the use of dip data and modern methods of structural geology essential in mapping. He participated in Amoco’s surface geology field programs, which documented the dip-domain character of folds in the Thrust Belt, providing valuable geometric constraints on subsurface maps. By taking part in teaching Amoco Denver’s structural field seminars, Morse helped other geologists,

Our Instructors
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 lift systems, onshore and offshore. In the service sector, he has worked for offshore engineering and construction firms, Doris Inc. and Getty Oil Company/Texaco/Chevron from 1978 to 2002. He retired from Shell and an MS in geophysics from Michigan State University, and an MBA from Rice University.

MR. TIM NIEMAN

is a National Association of Engineers (NACE) certified Chemical Treatment Corrosion Specialist and Internal Corrosion Specialist, and is the author of numerous technical publications on the subject of corrosion. He has a BS, an MSc, and a PhD in Mechanical Engineering, and Post-Doctoral studies in Erosion/Corrosion from the University of Tulsa. His 30 years of experience in the oil and gas industry have resulted in his becoming a subject matter expert on internal corrosion, erosion, chemical treatment, material selection, water treatment, and corrosion consulting. Mr. Nieman has worked in Argentina, Bolivia, Peru, Ecuador, Mexico, Argentina, Venezuela, Kuwait, and the US. Dr. Palacios has been an instructor for over 20 years and has extensive experience in leading seminars, and developing and teaching industry courses in: Saudi Arabia, Malaysia, Turkey, USA, Mexico, Colombia, Spain, UAE, Vietnam, Venezuela, and India. He has served as a professor for both undergraduate and graduate courses at the University of Tulsa and various universities in South America. Dr. Palacios holds a US Patent # 7,942,201 for a Downhole Chemical Dispersion Device. He leads technical committees in NACE International to develop Standard Practices. He is a recipient of the NACE Distinguished Service Award in March 2013. He was International Director for the NACE Foundation from 2005 to 2013.

MR. WILLIAM K. OTT

is an independent petroleum consultant and is the founder of Well Completion Technology, an international engineering consulting and petroleum industry training firm established in 1986. Before consulting and teaching, he was division engineer for Halliburton’s Far East region based in Singapore and a research field coordinator for Halliburton in Oklahoma. He works regularly with and on wells requiring various well completions techniques, principally in East Asia. He has conducted technical petroleum industry courses worldwide and provides training and consulting services in Calgary, Edmonton, Vancouver, Montréal, Toronto, New York, and worker operations. He is a registered professional engineer in Texas, and a 25-year member of SPE. He received a B.S. in Chemical Engineering from the University of Missouri.  

MR. JOHN ROBERT (BOB) NICHOL

is President of Petrobob Consulting Limited, located in Sherwood Park, Alberta, Canada. He has over 35 years’ experience in a broad range of petroleum engineering roles including field operations, reservoir engineering, and engineering research. Bob received a BSc in Electrical Engineering, an MEng in Mineral Engineering, and a PhD in Petroleum Engineering from the University of Alberta. He is currently employed at the Alberta Government, Department of Energy in Edmonton.

MR. TIM NIEMAN

is President of Decision Applications, Inc., a San Francisco area based decision analysis consulting firm. His professional experience includes 20 years in leading and consulting projects of various sizes and scopes involving the application of decision and risk analysis methodologies in the energy and environmental sectors, and 10 years as a practicing petroleum geophysicist. His background includes work in decision analysis, risk analysis, business modeling, financial forecasting, strategic planning, R&D portfolio management, software development, geology, and geophysics. Mr. Nieman was formerly Senior Decision Analyst for ConocoPhillips and an Oakland based geological and environmental consulting firm. Prior to that, he was Director of Operations for Luminia Decision Systems, a decision analysis consulting and software firm. And prior to that, he spent 15 years with Amoco as a geophysicist, economist, and risk and portfolio analyst. He has a BS in geology and an MS in geophysics from Michigan State University, and an MBA from Rice University.

MR. RONNIE NORVELL

was Director of Instructional Design and Quality at PetroSkills 2009-2012. Prior to joining PetroSkills, Ronnie served as a Sr. Consultant and had frequent appointments as Director of Continuing Excellence with the Saudi Aramco E&P Continuing Excellence Department. Prior to joining Saudi Aramco in 1998, Ronnie Norvell was the President and Managing Partner of Management Paradigms, a U.S. based consulting firm specializing in management and leadership development. Over the past forty years he has provided senior management consulting to a large spectrum of U.S. and foreign industries, managed the training functions of two major corporations, and served as a college administrator and instructor. Ronnie has served on the Board of Directors of three international organizations: American Society for Training and Development and PetroSkills. He has also served on the continuing education faculty of the University of Texas at Dallas and on the adjunct faculty of Amber University’s MBA program. Ronnie has authored numerous publications, designed and conducted a variety of programs targeted at enhancing management and employee productivity. He co-authored The Internal Outplacement Handbook and A Trainer’s Guide to Performance Appraisal. His peers have recognized him on numerous occasions. The American Society for Training and Development recognized Ronnie in 1997 for his contributions to the profession by awarding him with one of their highest honors, the “Torch” award. The Dallas Chapter of ASTM recognized him as the “Professional of the Year” in 1989 and his alma mater, Texas &M University at Commerce, selected him as a “Distinguished Alumni” in 1990.

MR. ANDREW PEPPER

is Director of This is Petroleums SLLC – “tips” - 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. Since 2008, the focus has been primarily on the Gulf of Mexico and Permian Basins. He has handeled functional roles including responsibility for internal training at BP, Hess and BHP Billiton since 2000. Prior to forming tips, from 2012-2015 he was VP of Geoscience and VP of Unconventional Exploration at BHP Billiton. At Hess, from 2003-2012, Andy was Chief Geologist and Director of New Ventures (Conventional and Unconventional). At BP, in Houston, he led the Petroleum Systems Network from 2000-2003, after working in the team that positioned and delivered BP’s research, structural principles in their mapping. After leaving Amoco, he founded a consultancy that specialized in mapping complex structures using modern structural methods, including SCAT dip analysis. With SCAT inventor C.A. Bengtson, Morse co-authored papers on the advantages of SCAT in mapping both subtle and complex structures. Recognizing the value of SCAT for markedly improving structure maps, Morse and a partner developed GEODES, a SCAT-based program for complete structural interpretation of dip data. In 1991, the partners founded CG to provide subsurface mapping and GEODES dip analysis services. Morse and CG have consulted for clients worldwide in extensional, compressional, and transpressional terrains and have mapped both simple and complexly faulted and folded structures, including structures below salt, where seismic is often too poor. CG’s clients have included operators worldwide in major plays to improve subsurface structure maps of many important fields, including October (Gulf of Suez) and Thunderhorse (Gulf of Mexico), both of which are subsalt giants. Morse earned his BA from the University of Vermont and MS from Texas A & M, both in Geology.

MR. ROBERT (BOB) NICHOL

is President of Petrobob Consulting Limited, located in Sherwood Park, Alberta, Canada. He has over 35 years’ experience in a broad range of petroleum engineering roles including field operations, reservoir engineering, and engineering research. Bob received a BSc in Electrical Engineering, an MEng in Mineral Engineering, and a PhD in Petroleum Engineering from the University of Alberta. He is currently employed at the Alberta Government, Department of Energy in Edmonton.

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Mr. William E. Powell is a Senior Reservoir Engineer. He has over 30 years of experience in reservoir engineering and field operations in the area of multiphase flow. His primary areas of interest are multiphase flow in well bores, flow lines and production equipment, multiphase meters and pumps, computational fluid mechanics, advance separation technology and paraffin and hydrate deposition in production flow lines and wells. He has been recognized for his expertise in multiphase flow and reservoir simulation. He has a B.S. degree in Petroleum Engineering from the University of Texas at Austin. He is a member of the SPE, SPELA, AIME and the ASME. He has over 30 years of experience in the oil and gas industry with Schlumberger. His most recent assignment with Schlumberger was as North America Business Development Manager for Data & Consulting Services where he maintained close relationships with numerous major and independent oil and gas companies. Bill currently performs the role of PetroSkills Integrated Disciplines Manager for Unconventional Resources.

Dr. Cliff Redus is an independent petroleum engineering consultant who specializes in production system optimization and subsurface 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 petroleum industry experience, both in production research and field operations in the area of multiphase flow. His primary areas of interest are multiphase flow in well bores, flow lines and production equipment, multiphase meters and pumps, computational fluid mechanics, advance separation technology and paraffin and hydrate deposition in production flow lines and wells. He was in a supervisory capacity in production related technical studies and as the last 10 year with Texaco’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 in multiphase flow, and as executive director of Tulsa University Fluid Flow Projects. 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.

Dr. 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 Anadarko in California, Saudi Arabia and Texas. He has held various high-level technical and management positions. His work and expertise has been diversified covering oil and gas reservoirs, onshore and offshore properties, primary, secondary and tertiary operations, and reservoir evaluation and development projects. His responsibilities have been in reservoir engineering and reservoir simulation, but he has also done production engineering and exploratory work testing. He has significant experience in preparing and conducting schools and workshops and has been an SPE Short Course instructor since 2000. He has published technical papers in refereed journals and has many technical 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 Ph.D. degree in Chemical Engineering from the California Institute of Technology.

Mr. Gerry H. Ross has more than 39 years’ formation evaluation and rock physics experience. He has participated in global oil and gas operations from exploration through production. From 2002 until 2016, while at PetroSkills, he was an executive VP with responsibility for Alliance membership growth and expansion, PetroSkills business development, PetroSkills Technology, and the online ePetro industry overview program. While with Core Lab, he provided training to both majors and independents on a worldwide basis. During this time, he was the instructor and co-coordinator of an extensive internal Petrophysics applications program. This multi-year program focused on the applications of rock and fluid data in log analysis, formation evaluation, reservoir engineering and production. He also worked with major research centers and universities globally to provide reservoir conditions instrumentation for reservoir characterization 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, SPELWA, PESGB, SEAPEX and a past president of the Aberdeen Chapter of the SPELWA.

Our Instructors
corporate planning, and evaluation software. He has presented over 290 courses in 34 countries since 1989. He was vice president and petroleum engineer with Security Pacific National Bank, planning and evaluation analyst at Cities Service Oil Co., manager of business systems for Cities Service's Petrochemicals Division, and senior management consultant with a national accounting firm.

He is a member of eight professional organizations and is an author and speaker on modern analysis of the geomechanical behavior of reservoirs and caprocks in response to pressure and temperature changes. He has authored or co-authored 21 technical papers, a monograph chapter and holds 6 patents.

He is a Register Professional Engineer in Colorado, Oklahoma, and Wyoming and a member of SPE, AIME, NRPA, and CIM.

He received a Ph.D. in Mechanical Engineering from the University of Colorado.

**MR. ROD SIDLE** 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 Reserves Manager/Director in each of these companies developed the knowledge he draws from to instruct on Reserves Estimation and Reporting. He has delivered in-house Reserves instruction courses for Shell and Oxy as well as being a speaker and participant at numerous national and international conferences. He holds a B.S. from the University of Colorado and an MBA from the University of Colorado.

**MR. JOHN SEIDLE** is a Vice President and Senior Reservoir Engineer with M&A Petroleum Consultants, a Denver based petroleum consulting firm. He has more than 30 years’ experience in unconventional gas reservoirs, primarily coalbed methane. His coalbed methane experience includes exploration, development, production optimization, and enhanced recovery 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 shale plays in the USA, Canada, and China. He has taught an industry coalbed methane course for over a decade. He has authored 18 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, AIME, CRPS, and CIM.

He received a PhD in Mechanical Engineering from the University of Colorado.

**MR. SUBHASH N. SHAH** is the Stephenson Chair Professor and Director of the Well Construction Technology Center at the Mewbourne School of Petroleum and Geological Engineering at the University of Oklahoma in Norman. He has a distinguished career in the oil and gas industry for over 35 years, 18 years in industry predominantly with Halliburton Energy Services and 10 years with Schlumberger. He enjoys teaching at undergraduate and graduate levels and supervises students’ research leading to masters and doctoral degrees in petroleum engineering (PE). He directs a well-established center to conduct PE research and collaborates with several industry partners. He travels world-wide to deliver lectures and to provide consulting services to the O&G industry. He has authored over 250 technical papers in more than 20 international journals.

His areas of expertise include onshore/offshore drilling, stimulation, well completions, and sand control. He holds four US patents and holds two pending. He is a Chairman of ISO 13503 Procedure for Friction Pressure Measurements, and serves on the Editorial Boards of SPE since 1984, Petroleum Science since 2006 and International Journal of Oil, Gas and Coal Technology since 2006.

He has been well-recognized by his peers and is a recipient of numerous industry and academic awards. He has a BS from the MS University of Baroda as well as an MS and PhD from the University of South Carolina. He is an Adjunct Assistant Professor at Texas A&M University, teaching reser...
and practical petrophysics plus numerous papers on the topic. His academic teaching experiences have been in the areas of petrology, petrophysics, and environmental geology. While the AAPG Geoscience director, he led a tenfold increase in titles published including digital and book releases. He has received honors for work on the local level in the Rocky Mountains, Canada, China, and the Middle East. He was recognized as a Society of Petroleum Engineer’s Distinguished Lecturer in 1994–95 traveling Southeast Asia, the Middle East, and the United States focusing on the importance of rock-log calibration in reservoir characterization. Professional memberships include the AAPG, SPE, SPWLA, TGS, RMAG. He is past president of the SEPM Clastic Diagenesis Research Group, Sigma Xi (Local), and Sigma Gamma Epsilon. He received BA and MS degrees from the Miami of Ohio University and a PhD from the University of Oklahoma.

MR. KYLE TRAVIS is a Petroleum Engineer with 32 years of diversified experience in the oil and gas industry. He has a proven track record of effectively building oil and gas companies from infancy to significance. His experience includes managing oil and gas companies from the initial formulation of a business plan and establishment of operations to the execution of such a drilling program utilizing expandable tubulars which saved over $1MM per well. Prior to this role he was the Burlington project manager for the rig and rig-less environments, both land and offshore including deep water. While coordinating completion and testing phases, he became familiar with electric wire line, coil tubing and slick line operations. He has a high level of understanding of worker performance, safety, and process optimization. He has authored applications in Visual Basic for hydraulic calculations, risk assessment, financials and training purposes. He is IWCF certified, received a BS in Chemistry, is fluent in English, Spanish and Portuguese, and communicates in French.

MR. HUGO VARGAS has more than 33 years of active experience in oil fields. He provided professional technical training to engineers and supervisors as a Senior Technical Instructor for 5 years. He worked in office and field positions with both service and oil companies. His experience includes supervision, execution and management with well testing, down hole tools, data acquisition, completions, cementing, fracturing, stimulations and worker in general. He has coordinated testing operations at well sites with authority over all service companies at rig and rig-less environments, both land and offshore including deep water. While coordinating completion and testing phases, he became familiar with electric wire line, coil tubing and slick line operations. He has a high level of understanding of worker performance, safety, and process optimization. He has authored applications in Visual Basic for hydraulic calculations, risk assessment, financials and training purposes. He is IWCF certified, received a BS in Chemistry, is fluent in English, Spanish and Portuguese, and communicates in French.

MR. COLIN WATSON has over 41 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 Engineering 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 latterly worked to develop strategic structures and governance systems to manage Process Safety and Integrity Management for the BP Grangemouth Complex and the European BP Chemicals Sites. His operations experience providing technical support and engineering management extends across a variety of petrochemical and refining operations. He holds a BSc in chemical engineering from Edinburgh University (1978) and is a Chartered Engineer with the Institute of Mechanical Engineers.

MR. ROBERT (BOB) V. WESTERMARK is a seasoned engineer with international and domestic experience. He has worked both on and offshore including underbalanced, horizontal, multilateral, coiled methane, and geological drilling wells operations. As a team leader, he has run successful drilling and completion alliances and partnering programs. Mr. Westermark 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. Westermark 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.

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 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 University of Utah 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 Northridge, an MS in petroleum engineering from the University of Tulsa, and he is a registered petroleum engineer in California.

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