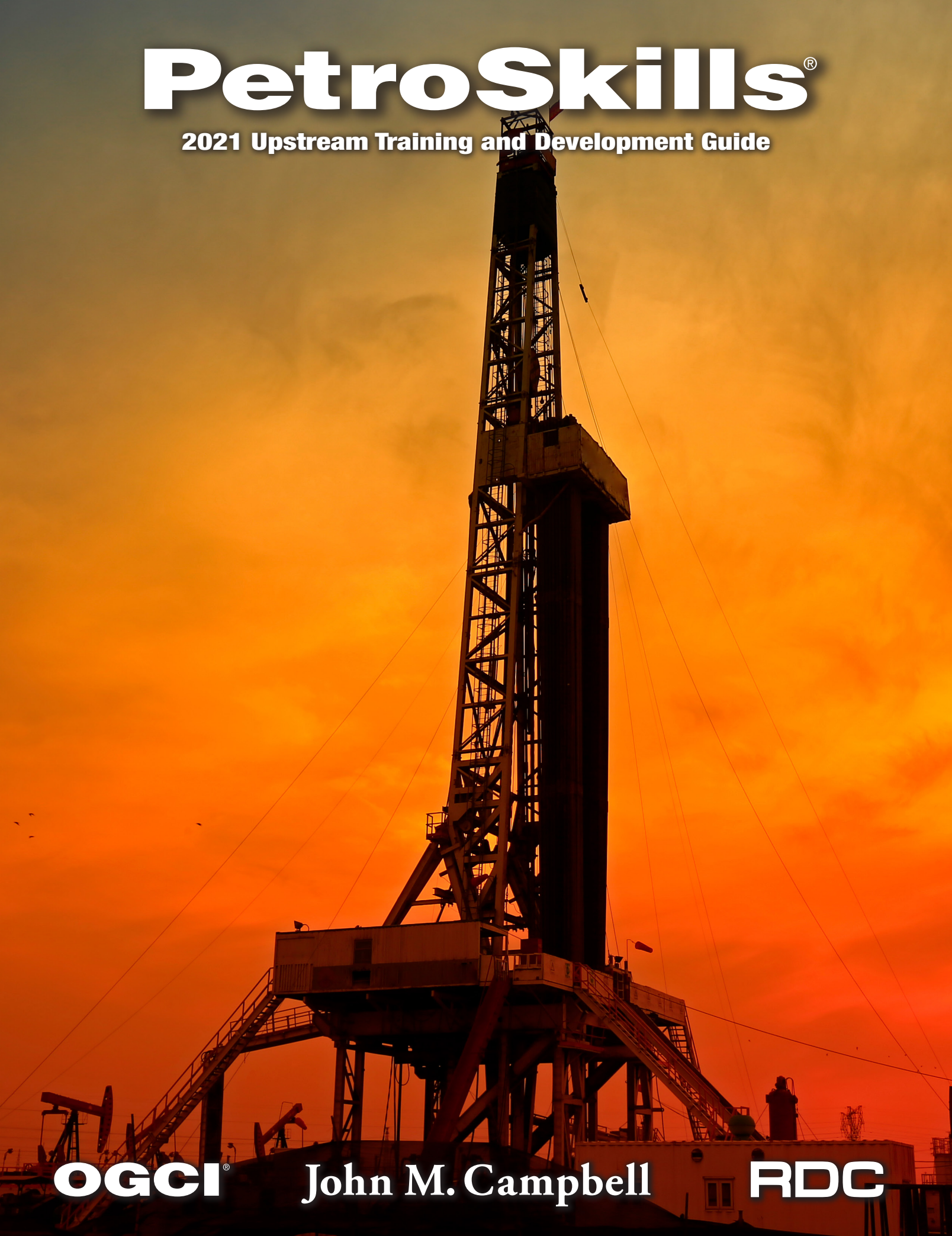
PetroSkills®

2021 Upstream Training and Development Guide



OGCI® John M. Campbell RDC

Message from the CEO

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.

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

MULTI-DISCIPLINE TRAINING

GEOLOGY

GEOPHYSICS

WELL CONSTRUCTION / DRILLING

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PetroSkills®

The Alliance is the Advantage

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:

The PetroSkills Alliance spans the full energy value chain. Member companies include:

bp · Shell · HALLIBURTON · أرامكو السعودية saudi aramco · OXY · ConocoPhillips · Chevron · REPSOL · MOLGROUP · سابك sabic · Kuwait Oil Company · noble energy · BHP · sasol reaching new frontiers · شركة النفط العمانية ش.م.ع.م. Oman Oil Company S.A.O.C. · devon · ecopetrol · OMV · PIONEER NATURAL RESOURCES · PLAINS ALL AMERICAN PIPELINE, L.P. · CHESAPEAKE ENERGY · CHENIERE · ONEOK · OGCI · TTG Systems · John M. Campbell · UTT · RDC · 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

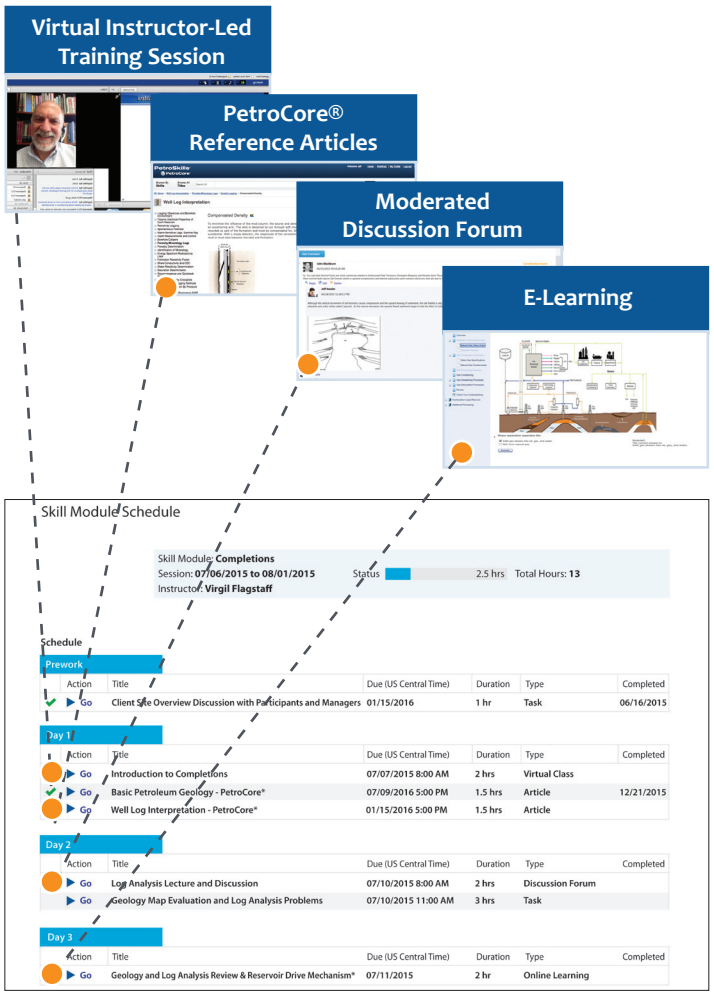
PetroSkills® PetroAcademy™

Blended Learning 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:



For more information, visit petroskills.com/blended

Basic Petroleum Technology Principles – BPT

BASIC 20 HOURS

PetroSkills® PetroAcademy™

BLENDED LEARNING

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

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

Self-paced, virtual course - start anytime. Tuition US$2700

FOR MORE INFORMATION, VISIT PETROSKILLS.COM/BPTONLINE

Basic Petroleum Technology – BPT

BASIC 5-DAY

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	27 SEP-1 OCT	$4310
	6-10 DEC	$4310
LONDON, UK	8-12 NOV	$5035+VAT
VIRTUAL	26 APR-7 MAY	$3890

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 oil/gas 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, Petrophysics)
- 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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-26 OCT	$2605

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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 JUL	$4355
LONDON, UK	6-10 DEC	$5080+VAT
VIRTUAL	10-21 MAY	$3890

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 • Coil tubing operations • Wireline techniques • Well stimulation - surfactants, solvents, acidizing, hydraulic fracturing • Formation and sand control - mechanical retention, chemical consolidation, and gravel packing • *and more...*

2021 Schedule and Tuition (USD)

DALLAS, US	11-15 OCT	$4255
DENVER, US	12-16 JUL	$4305
HOUSTON, US	6-10 DEC	$4310
LONDON, UK	9-13 AUG	$5035+VAT
VIRTUAL	15-26 MAR	$3890

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 world-wide distribution and geologic setting of the more significant heavy oil occurrences including Venezuela

COURSE CONTENT

Comparison of conventional and unconventional reservoirs • Worldwide heavy oil resources and occurrences • Bitumen and heavy oil definitions and introduction • Geology, history, and development of Canada 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 Venezuela • Introduction of United States heavy oil occurrences (Utah, California and Texas)

See website for dates and locations.

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) • Geology, history, and development of Canada heavy oil/oil sands • Heavy oil/oil sands characteristics and development strategies • Oil sands mining details and reclamation • Environmental challenges for oil sands resources • Heavy oil and in-situ oil sans recovery process review • Introduction to Steam Assisted Gravity Drainage (SAGD) • Other commercial thermal in-situ methodologies • Commercial application of Cold Heavy Oil Production with Sand (CHOPS) in Canada and other non-thermal heavy oil recovery methods • Field examples and development strategies of heavy oil and in-situ oil sands recovery projects • Overview of thermal well completions and production facilities • Reserves and economics

See website for dates and locations.

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
- Estimate gas and oil in place
- Apply different resource evaluation techniques recognizing the advantages and disadvantages of each technique
- Apply drilling, completion, and stimulation technology to shale gas and shale oil formations
- Evaluate and forecast individual well and reservoir performance
- Determine how to estimate well reserves in both PDP (proved developed producing) and PUD (proved undeveloped) categories

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DENVER, US	8-12 NOV	$4405
HOUSTON, US	9-13 AUG	$4410

** plus computer charge*

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 (NTS) 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 airline 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 (define situation and goal, previous experience, risks, options, check) • Communications (exchange information, explain context, clear and concise, relevant inclusion) • Teamwork (responsibilities, co-ordinate tasks, resolve gaps/duplications, 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)

See website for dates and locations.

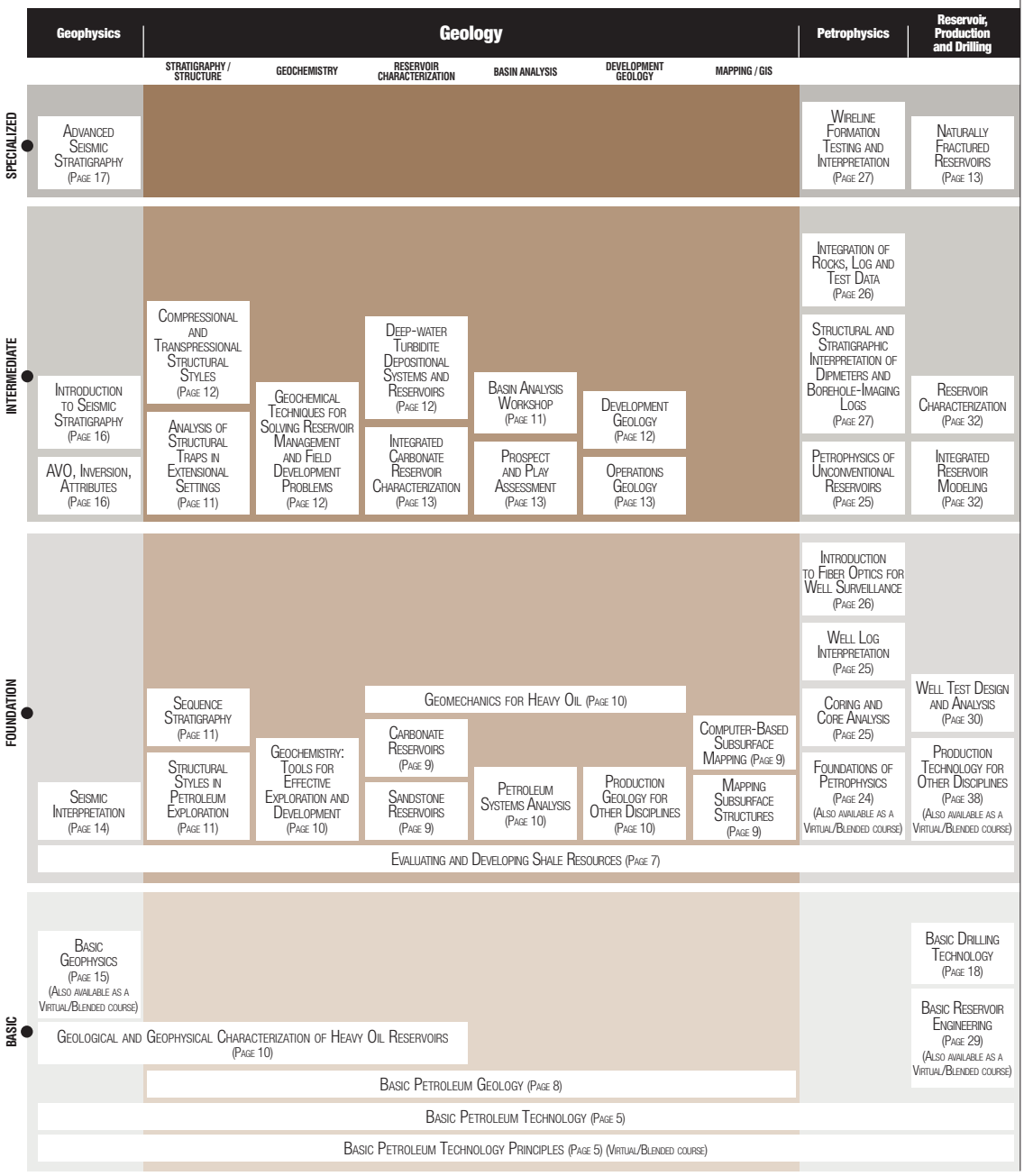
Geology
Course Progression Matrix

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:

Mr. Jeff Aldrich
Mr. Peter Bartok
Dr. Steven Boyer
Mr. Satinder Chopra
Dr. Michael Grammer
Dr. James Granath
Mr. Andrew Harper
Dr. Howard Johnson
Mr. Jeff Lelek
Mr. Larry Lens
Ms. Randi Martinsen
Dr. Mark McCaffrey
Mr. Dave McGee
Dr. Tim McMahon
Mr. James Morse
Mr. Larry Moyer
Dr. John Pigott
Dr. John Sneider
Mr. Mehrdad Soltanzadeh
Dr. Tom Temples
Dr. William Wade



Basic Petroleum Geology – BG

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	29 NOV-3 DEC	$4420

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, isochore, and other subsurface maps using interpretation or mapping software.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	3-7 MAY	$4410

** plus computer charge*

Carbonate Reservoirs – PCR

FOUNDATION 5-Day

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

In 2013 a new book, Carbonate Reservoirs, was prepared by 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_2S 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

2021 Schedule and Tuition (USD)

HOUSTON, US	15-19 NOV	$4440
DOHA,	5-9 SEP	$5580

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 recent environments, outcrops, cores, wireline logs, and test/production data from oil and gas fields in various parts of the world (United States, North Sea/Atlantic, Africa, Middle East, Far East, etc.). Practical exercises are taken from each of the principal depositional settings and involve detailed mapping, interpretation of core and log characteristics, and integration of data from FMI logs. Emphasis is placed on the application of fundamental sedimentary principles (modern, ancient, and subsurface) to actual subsurface data so that the participants can immediately use the information in their exploration and development activities.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Genetic stratigraphic analysis • Depositional architecture • Basins and units • Wireline logs and conventional cores • Seismic and sequence stratigraphy • Recognition of depositional systems • Process-response facies models • Integrated genetic stratigraphy • Analysis of clastic depositional systems • Alluvial fan • Fluvial • 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

2021 Schedule and Tuition (USD)

DUBAI, UAE	14-18 NOV	$5550+VAT

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 your data. Principles and techniques are illustrated by solving numerous exercises by hand (with drafting tools and a calculator) using strategies and workflows analogous to those that participants will use back at the office using computers. Participants will be prepared to develop more accurate structural models of reservoirs, avoid dry holes, find new traps in old fields, extract the maximum information from exploration wells, and validate or recognize errors in existing interpretations. Dr. Richard Groshong's book, 3D Structural Geology, is included with the course materials.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Recognize common contouring pitfalls
- Find thickness in deviated wells
- Use thickness maps to interpret 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 (Allan) diagrams for fault trap and seal analysis
- Map structures with multiple overlapping faults

COURSE CONTENT

Manual and computer contouring techniques • Using dip in mapping • Different measures of thickness • Thickness in deviated wells • Thickness maps • Dip-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

2021 Schedule and Tuition (USD)

DUBAI, UAE	31 OCT-4 NOV	$5550+VAT

** plus computer charge*

Geochemistry: Tools for Effective Exploration and Development – MGT

FOUNDATION 5-Day

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

DESIGNED FOR

Exploration and development geologists, geophysicists, 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 isotope 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 isotope 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

2021 Schedule and Tuition (USD)

HOUSTON, US	15-19 NOV	$4520
VIRTUAL	15-26 MAR	$3990

Geomechanics for Heavy Oil – HOGM

FOUNDATION 3-Day

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

COURSE CONTENT

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

See website for dates and locations.

Geological and Geophysical Characterization of Heavy Oil Reservoirs – HORC

BASIC 3-Day

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

COURSE CONTENT

Mechanisms for the formation of heavy oil • General phase behavior of hydrocarbons and heavy oil • Properties of heavy oil and rock physics analysis • Geophysical approaches to characterization of heavy oil reservoirs • Measuring and monitoring heavy oil 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 • Jeopardy exercises on each of these units

See website for dates and locations.

Petroleum Systems Analysis – PSA

FOUNDATION 5-Day

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

YOU WILL LEARN HOW TO

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

See website for dates and locations.

Production Geology for Other Disciplines – PGD

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Understand the sources of geological data and the interpretation of that data, including maps, cross-sections, 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

COURSE CONTENT

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

See website for dates and locations.

Sequence Stratigraphy: An Applied Workshop – SQS

FOUNDATION 5-Day

FIELD TRIP

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Identify unconformities and sequence boundaries
- Identify parasequences 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/production strategies

COURSE CONTENT

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

See website for dates and locations.

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 occurs and the range of trap styles to be expected. This course provides an overview of all hydrocarbon-bearing structural assemblages and their associated trap types. The processes that produce the structures and control their styles are interpreted in terms of basic rock-mechanical principles. Classic outcrops, 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
- Distinguish the characteristics of each structural style on seismic reflection profiles
- Recognize the arrangement of structural styles and traps within structural families
- Apply mechanical-stratigraphic concepts to 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 substratal 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 • Roho and counter-regional pseudoextensional fault systems • Plate-tectonic habitats of structural assemblages • Tectonic synthesis and exploration project

2021 Schedule and Tuition (USD)

HOUSTON, US	5-9 APR	$4410

Analysis of Structural Traps in Extensional Settings – ESS

INTERMEDIATE 5-Day

FIELD TRIP

Extensional terranes 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 common 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 intracontinental rifts. Fault linkage, relay ramp, transfer systems, and intrabasinal structural geometries are investigated in 3D using predictive kinematic and restorative 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

Exploration and development geologists, geophysicists, engineers, and managers responsible for the interpretation and drilling of extensional environments.

YOU WILL LEARN HOW TO

- Recognize the characteristics of extensional and trans-tensional deformation for both basement-involved and thin-skinned styles
- Apply mechanical stratigraphic principles and restoration/balance thinking in interpretation of seismic and other data for extensional structures
- Predict structural geometry from sparse or inconsistent data using kinematic principles
- Critically evaluate interpretations and cross sections for extensional structural environments
- Develop prospects from trapping geometries in extensional structures

COURSE CONTENT

Variety of extensional structural styles and their habitats of development • Fundamental processes of the growth and coalexcence or extensional structures • *and more...*

2021 Schedule and Tuition (USD)

HOUSTON, US	1-5 NOV	$4510

Basin Analysis Workshop: An Integrated Approach to the Exploration and Evaluation of Conv. and Unconv. Resources – BA

INTERMEDIATE 5-Day

Basin analysis, whether for conventional or unconventional resource play analysis, demands an integrated approach from explorationists. It is both inappropriate and misleading to suggest that the tectonic-thermal-sedimentologic evolution of any one basin is an established fact, or even that all basins submit to the same simple and equivocal models. Therefore, this five-day course does not passively present an inventory of basins of the world. Instead, this workshop provides the theory, methods, and active practice for participants to develop and optimize their own individual basin evaluation and modeling modus operandi. Incorporated as practical problems for workshop analysis and substantial team discussion are case histories and new findings from throughout the world utilizing geologic, geophysical, and geochemical data sets. In addition, students construct and interpret their own 1D and 2D basin models using BASINMOD, an industry standard of basin modeling software.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Systematically assess the evolution of a basin's conventional and unconventional petroleum system criticals through space and time through a practical application of geology, geophysics, and geochemistry
- Evaluate the geomechanical fundamentals controlling a basin's burial history through tectonic subsidence analysis
- Relate organic source quantity and quality to sedimentary processes and environments
- Delineate migration pathways through space and time
- Evaluate seal/trap quality
- Geovalidate 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 both well control and seismic generated virtual wells
- *and more...*

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 APR	$4510

** plus computer charge*

Compressional and Transpressional Structural Styles – CPST

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Distinguish the characteristics of compressional and transpressional deformation including distinguishing thin-skinned and basement-involved styles
- Identify the fundamental characteristics of the wrench assemblage
- 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 compressional and transpressional structures

COURSE CONTENT

Compressional structural styles and their plate-tectonic habitats • Wrench assemblage • Transpressive structures • Detached (thin-skinned) styles including forearc, backarc, collisional, and deep-water thrust-fold belts • Basement-involved styles including compressional drape folds, predictive models for rotated blocks, and subthrust 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 compressional structures • Summary of oil and gas fields

2021 Schedule and Tuition (USD)

HOUSTON, US	21-25 JUN	$4510

Deep-water Turbidite Depositional Systems and Reservoirs – DWT

INTERMEDIATE 5-Day

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of iteration of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow 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 petrophysicists.

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 geometrics • Seismic character of deepwater systems • Borehole/wireline characteristics • Significance and use of various tools • Correlation of reservoir units • Predictive models for sand distribution • Critical data input to reserve models • Definition of pay

2021 Schedule and Tuition (USD)

HOUSTON, US	4-8 OCT	$4510

Development Geology – DG

INTERMEDIATE 5-Day

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

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

2021 Schedule and Tuition (USD)

HOUSTON, US	1-5 NOV	$4510
LONDON, UK	16-20 AUG	$5235+VAT

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

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, PeakView, ReserView, OilUnmixer, 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

See website for dates and locations.

Integrated Carbonate Reservoir Characterization – ICR

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	16-20 AUG	$4680
LONDON, UK	8-12 NOV	$5405+VAT

Operations Geology – OG

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Plan and prepare for a drilling location and for geological services
- Identify drilling operations and geological drilling hazards
- Understand and apply logging services
- Understand well testing services
- Evaluate drilling reports
- Describe drilling cuttings and cores
- Evaluate the impact on the field development plan
- Prepare and compile operations reports

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	9-13 AUG	$4510
KUALA LUMPUR, MYS	6-10 DEC	$5425

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 exists. This course offers the industry quantitative, probabilistic play and prospect assessment procedures that are consistent and repeatable allowing for direct comparisons play to play or prospect to prospect. In addition, the methods offer measures of the play prospectiveness based on the number and resource size distribution of potential future fields. Tools include comprehensive assessment forms for prospects and plays, and graphs, data tables, and guidelines for making all assessment decisions.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	23-27 AUG	$4510
LONDON, UK	12-16 JUL	$5235+VAT

** plus computer charge*

Naturally Fractured Reservoirs: Geologic and Engineering Analysis – FR

SPECIALIZED 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	1-5 NOV	$4610

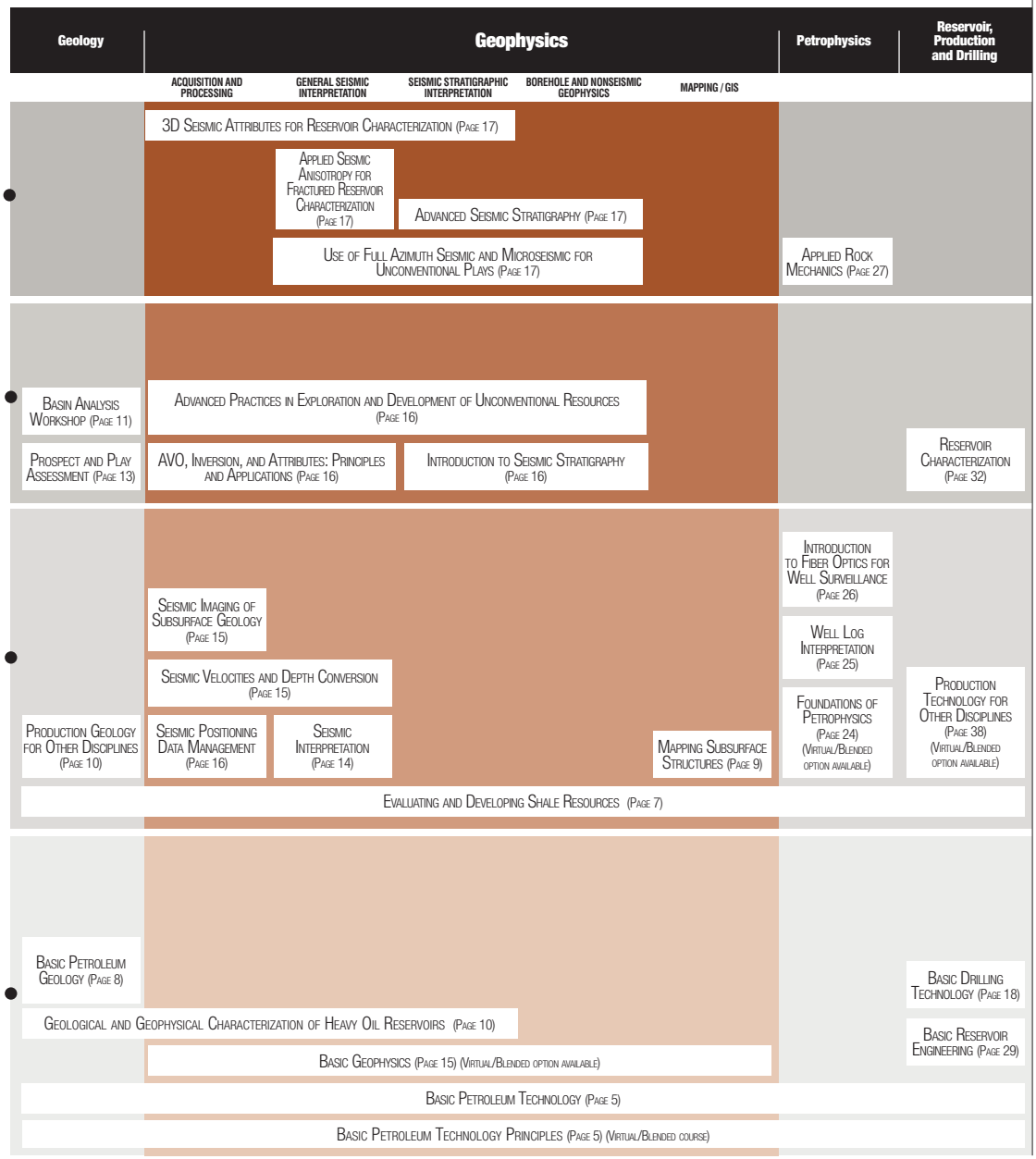
Geophysics
Course Progression Matrix

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

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

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

Mr. Peter Bartok
Mr. Bob Brune
Dr. Michael Burianyk
Mr. Satinder Chopra
Mr. John Logel
Dr. Heloise Lynn
Dr. Walter Lynn
Dr. David Muerdter
Mr. Marco Perez
Dr. John Pigott
Dr. Tom Temples



Seismic Interpretation
– SI1

FOUNDATION 5-Day

Can I observe the reservoir on seismic? How large is the reservoir? Did the well cut a fault? Can seismic help me tie a set of wells? What kind of a structural trap did I drill into? Is the structure valid or a seismic artifact? Are these reflections real or multiples? How can I combine structural and stratigraphic interpretations to develop a structural and depositional history? How does seismic data acquisition and processing impact my interpretation? Will my well encounter hazards such as abnormal pressure or shallow gas? The participant learns to answer these and related questions by gaining an understanding of the seismic system, its limitations and pitfalls, and by interpreting 2D and 3D seismic examples of structural and stratigraphic features associated with actively producing hydrocarbon areas.

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

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

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

2021 Schedule and Tuition (USD)

HOUSTON, US	21-25 JUN	$4410
VIRTUAL	15-26 MAR	$3990

Basic Geophysics – BGP

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

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

19 APR-11 JUN 2021 US$3890
20 SEP-12 NOV 2021 US$3890

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

PETROSKILLS.COM/BLENDED-BGP

2021 Schedule and Tuition (USD)

HOUSTON, US	15-19 NOV	$4310

Seismic Imaging of Subsurface Geology – SSD

FOUNDATION 5-Day

Basic seismic imaging principles and techniques are introduced at the outset of the class to establish the purpose, underlying principles, parameterization, and limitations of the various processing steps leading to final seismic images provided by current state-of-the-art imaging techniques. The course focuses on 3D seismic data. By the end of the course, the participant will understand and appreciate the many steps leading to final interpretable 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.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Assess and determine data processing flows for a variety of acquisition and reservoir scenarios
- Determine the most cost-effective imaging or migration technique given acquisition and structural scenarios
- Recognize various noises and how best to mitigate them
- Assess and appreciate the sensitivity of data processing parameters on final images
- Estimate the vertical and lateral resolution of the processing and attribute products
- Understand 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: pre-stack time and pre-stack depth migration • Migration velocity analysis techniques

See website for dates and locations.

Seismic Velocities and Depth Conversion – SVDC

FOUNDATION 5-Day

This course will teach you how to use velocity information and structural inputs to build a consistent velocity model and/or calibrate ones that have been created during seismic data processing. This class is designed for the interpreter so that he or she understands the theory and practice of how to estimate depths from older time-migrated data, as well as how to quality control (QC) and calibrate newer PSDM data. Also covered 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, and S-wave • Velocity Inputs: accuracy and regional extent of each, including check shots, VSPs, sonic logs, time/depth functions, well picks and pseudo velocities, seismic velocities, and horizons for structural control • Synthetic Seismograms: creation, upscaling, and tie to seismic data. Advanced synthetics including synthetic gather creation, Zoeppritz equations, AVA, 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 raytracing, migration, and uncertainty • Introduction to Advanced Topics: anisotropy, pore-pressure prediction, geostatistics, and forward modeling

2021 Schedule and Tuition (USD)

DUBAI, UAE	19-23 SEP	$5550+VAT
HOUSTON, US	24-28 MAY	$4410

** plus computer charge*

Seismic Positioning Data Management – SPDM

FOUNDATION 2-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Seismic navigation data principles • Basic 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

See website for dates and locations

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 anoxia in unconventional reservoirs • Petrophysical and geophysical techniques in unconventional reservoirs; rock physics and brittleness • Geochemistry, kerogen typing, thermal effects, and reserve estimation • Physical parameters affecting unconventional resources: capillary properties, pressure, seal capacity, etc. • Using global and regional stress maps • Application of the Mohr circle • Determination of frac gradients • Leak-Off Test (Minifrac) and microseismic • Water disposal and aquifer contamination • Economic evaluation of unconventional reservoirs • Volumetric assessment considering free and adsorbed gas • Risk assessment, common risk segment (CRS) analysis

See website for dates and locations

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 interpretation project
- Better understand the nature of the seismic image as it relates to hydrocarbons
- Utilize the information available in the literature from experts in this rapidly developing part of seismic imaging

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	27 SEP-1 OCT	$4510
VIRTUAL	21 JUN-2 JUL	$4090

** plus computer charge*

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 geohistory analysis, helping describe a basin's evolution and the resulting effects upon its spatial and temporal variation in hydrocarbon potential. Seismic stratigraphy chronostratigraphically constrains both the sedimentological 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 selected from diverse settings around the world. Areas for the projects include borehole-constrained seismic data drawn from such regions as the Alaska North Slope, Gulf of Mexico, Red Sea, Southeast Asia, South America, and Western Africa.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

CALGARY, CAN	6-10 DEC	$4555+GST
HOUSTON, US	18-22 OCT	$4610

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 tectonics 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

2021 Schedule and Tuition (USD)

LONDON, UK	27 SEP-1 OCT	$5335+VAT
VIRTUAL	2-13 AUG	$4190

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 upon either cosmetic processing or interpretation as an art; instead, practical methods of seismic stratigraphy are employed as a science, based upon firm, tested principles that are applied to a spectrum of tectonic structural styles and depositional environments. Participants learn how to make seismic modeling-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 AVO)
- Understand the strengths and weaknesses of geovalidation using and misusing synthetics, seismic inversion, and VSP
- Determine fault mechanical stratigraphy through proper interpretation of fault imaging
- Understand the differences, weaknesses, and strengths of both the Vail with the Galloway sequence paradigms and when to optimally employ them
- Develop sea level curves from micropaleontology
- Construct detailed seismic facies maps and understand their relationship to Walter's law
- Classify deltas based upon their seismic characteristics
- Differentiate basin floor fan facies and parasequence sets
- Interpret clastic and carbonate depositional system responses to allocyclic and autocyclic 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 coherency) • 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 • Imaging hydrocarbons • Geohistory reconstruction • Optimizing exploration and development

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT	$4775
LONDON, UK	2-6 AUG	$5500+VAT

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 hydrofracturing to produce. The emphasis of the lectures is steered to 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 collect the data that reveal its presence, and other times because they didn't understand the benefits that properly recorded and processed anisotropic data provide. The class is usually designed as lectures in the morning, with field-data analysis in the afternoons. If the course is taught as an in-house course, with your own properly acquired and properly processed 3D data, then software applications useful for fractured reservoir analysis will be used during the class.

DESIGNED FOR

Working, interpretation geophysicists and other geoscientists assigned to evaluate fractured reservoirs or reservoirs requiring hydro-fracturing to produce.

YOU WILL LEARN HOW TO

- Ask necessary geotechnical questions about your reservoir and play; identify the geophysical data needed to answer those questions; design acquisition and processing procedures; 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 data.
- 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 seismology • *and more...*

See website for dates and locations.

Use of Full Azimuth Seismic and Microseismic for Unconventional Plays – FAMS

SPECIALIZED 5-Day

For surface seismic, participants will learn to evaluate azimuthal seismic in fractured reservoirs or resource intervals needing hydro-fracturing. The course presents reflection seismic and microseismic 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 geologic and/or 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-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

See website for dates and locations.

Well Construction / Drilling

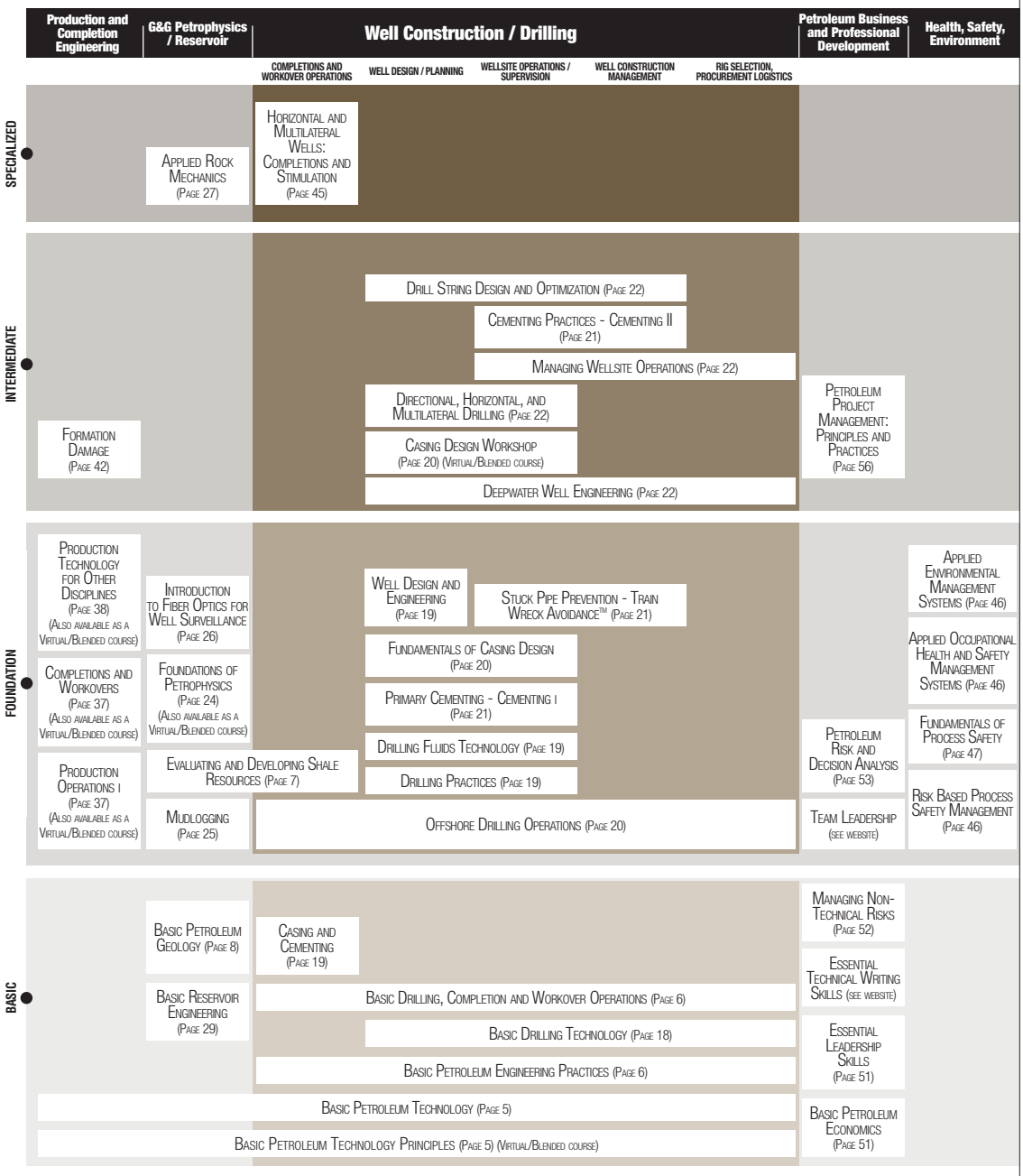
Course Progression Matrix

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** on page 21. Also, be sure to check out our exciting deepwater course **Deepwater Well Engineering - DWE** on page 21.

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

Mr. Peter Aird
Mr. George Armistead
Mr. James Bobo
Mr. Richard Carden
Mr. Kevin Cuyler
Mr. Mark Hackler
Mr. Aaron Klein
Mr. Steve Metcalf
Mr. Hector Moreno
Dr. Don Schmidt
Dr. Subhash Shah
Mr. Bob Westermark
Mr. Larry Wolfson



Basic Drilling Technology – BDT

BASIC 5-Day

FIELD TRIP

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 DEC †	$4585
VIRTUAL	19-30 APR	$3890

† includes field trip

Casing and Cementing – CAC

BASIC 5-Day

This course builds a firm foundation in the principles and practices of designing, planning and conducting successful casing and cement jobs. The course uses a process-based perspective that takes participants from initial casing depth and size selection, casing and liner design procedures, casing running practices, and planning and executing primary cementing through remedial cementing and 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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 JUL	$4310

Well Design and Engineering – WDE

FOUNDATION 10-Day

Well Design and Engineering integrates all major well design technologies from pre-spud 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 the 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 applications
- 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

2021 Schedule and Tuition (USD)

DOHA, QATAR	28 NOV-9 DEC	$9990
HOUSTON, US	1-12 NOV	$8490
LONDON, UK	20 SEP-1 OCT	$9885+VAT

Drilling Fluids Technology – DFT

FOUNDATION 5-Day

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 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 producibility
- Evaluate options for drilling fluid waste management

COURSE CONTENT

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

**Based on laboratory availability*

2021 Schedule and Tuition (USD)

ABERDEEN, UK	25-29 OCT †	$5385+VAT
HOUSTON, US	20-24 SEP †	$4585
VIRTUAL	10-21 MAY	$3990

† includes lab visit contingent on availability

Drilling Practices – DP

FOUNDATION 10-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	9-20 AUG	$7720

Fundamentals of Casing Design – FCD

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	16-20 AUG	$4410

** plus computer charge*

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, loads, and present a design which incorporates life cycle considerations. Estimation of standard and special loads is covered in detail. Standard theories of strength and failure are discussed as well as advanced considerations for combined loads. Topics related to safe handling, running and hanging practices will additionally be covered.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Virtual Schedule and Tuition (USD)

26 OCT-18 NOV 2021 US$3885

BLENDED LEARNING WORKSHOP STRUCTURE

- Virtual Instructor-led Training
- Online Learning Activity/Reading
- Exercise(s)

Week	Hours (Approx)	Subject
1	1	Opening Session: Overview
	2.5	Introduction to Casing Design
2	3	Select Casing Depth and Sizes
	0.5	Select Casing Depth and Sizes
	3	Calculate Collapse and Burst Loads
	1	Calculate Collapse and Burst Loads
	3	Casing Load Determination
3	3	Make Preliminary Casing Selection, Adjust for Axial Loads
	1	Make Preliminary Casing Selection, Adjust for Axial Loads
	3	Casing Selection for Collapse, Burst, and Axial Design
	4	Calculate Combined Load Effects, Adjust and Make Final Selection
	1	Calculate Combined Load Effects, Adjust and Make Final Selection
	1	Final Casing Design with Combined Loads
4	3	Additional Load Considerations
	1	Additional Load Considerations
	3	Workshop Wrap-up
5	2	*Optional session* - Creating Detailed Design for Portfolio Well

TO LEARN MORE, VISIT

PETROSKILLS.COM/CASING-DESIGN-WORKSHOP

Offshore Drilling Operations – ODO

FOUNDATION 3-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

See website for dates and locations.

Primary Cementing – Cementing I – PCE

FOUNDATION 4-Day

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-23 SEP †	$4145

† includes lab visit

Stuck Pipe Prevention – Train Wreck Avoidance™ – SPP

FOUNDATION 3-Day

The Stuck Pipe Prevention Train Wreck Avoidance workshop provides the most comprehensive coverage in the industry for understanding and preventing the underlying causes of Stuck Pipe, Wellbore Instability, Loss Circulation, and other sources of non-productive time (NPT) in drilling operations. The workshop also focuses on correct responses by individuals and teams, early warning signs, and minimizing the impact to drilling operations. Through world-class presentations, practical discussion, and the best reference and instructional materials available, delegates hone their knowledge of basic drilling technology and how it relates to avoiding NPT.

DESIGNED FOR

Entire drilling and completions team, including operator, drilling contractor, and service companies. Agendas are typically customized to address topics relevant to the team.

YOU WILL LEARN HOW TO

- Identify mechanisms and risk factors that lead to stuck pipe incidents
- Anticipate, prevent, recognize, and resolve stuck pipe due to wellbore instability, hole cleaning, differential sticking, and wellbore geometry
- Assess mechanics of wellbore stresses and the impact on wellbore stability
- Analyze trends to identify early warning signs of developing wellbore problems
- Use hole cleaning factors in both vertical and deviated wellbores
- Apply mechanics of jars and how to use them effectively
- Implement effective drilling and tripping practices
- Make cost-effective choices in planning fishing operations

COURSE CONTENT

Stuck Pipe Prevention • Rock mechanics • Wellbore stress • Wellbore instability • Trend recognition • Hole cleaning • Differential sticking • Wellbore geometry • Tripping practices • Fishing practices

2021 Schedule and Tuition (USD)

HOUSTON, US	7-9 JUN	$3310

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 jobs 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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT †	$4685

† includes lab visit

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 3+ 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 kick 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 GOM 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

2021 Schedule and Tuition (USD)

HOUSTON, US	10-14 MAY	$4510

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	6-10 DEC	$4510
MIDLAND	20-24 SEP	$4455
VIRTUAL	3-14 MAY	$4090

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	12-16 JUL	$4670

Managing Wellsite Operations – MWC

INTERMEDIATE 5-Day

Managing Wellsite Operations is an interactive course that teaches participants to successfully manage wellsite operational plans, resource time management, and control measures. Interpersonal skills associated with the art of managing the 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 competencies
- Manage communications to improve wellsite performance and build effective rig teams
- Manage the well monitoring program to reduce lost time risks

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	23-27 AUG	$4510

Explore the Unconventional.

PetroSkills®

PetroSkills delivers the knowledge and skills required for unconventional resource plays.

COURSE PROGRESSION MATRIX

	GEOPHYSICS AND GEOLOGY	PETROPHYSICS	RESERVOIR ENGINEERING	WELL CONSTRUCTION / DRILLING	PRODUCTION AND COMPLETIONS	FACILITIES, PROJECT AND BUSINESS
SPECIALIZED	USE OF FULL AZIMUTH SEISMIC AND MICROSEISMIC FOR UNCONVENTIONAL PLAYS - FAMS	APPLIED ROCK MECHANICS - ARM	HORIZONTAL AND MULTILATERAL WELLS: ANALYSIS AND DESIGN - HML1 COALBED METHANE RESERVOIRS - CMR UNCONVENTIONAL RESOURCE AND RESERVE EVALUATION - URRE		HORIZONTAL AND MULTILATERAL WELLS: COMPLETIONS AND STIMULATION - HML2	ADVANCED HYDRAULIC FRACTURING - AHF
INTERMEDIATE	BASIN ANALYSIS WORKSHOP: AN INTEGRATED APPROACH TO THE EXPLORATION AND EVALUATION OF CONVENTIONAL AND UNCONVENTIONAL RESOURCES - BA ADVANCED PRACTICES IN EXPLORATION AND DEVELOPMENT OF UNCONVENTIONAL RESERVOIRS - EDUR	PETROPHYSICS OF UNCONVENTIONAL RESERVOIRS - PUR	RESERVOIR MANAGEMENT FOR UNCONVENTIONAL RESERVOIRS - RMUR	DIRECTIONAL, HORIZONTAL, AND MULTILATERAL DRILLING - DHD	ARTIFICIAL LIFT FOR UNCONVENTIONAL WELLS- ALUW HYDRAULIC FRACTURING APPLICATIONS - HFU GAS PRODUCTION ENGINEERING - GPO	ONSHORE GAS GATHERING SYSTEMS - PF-45
FOUNDATION	PETROLEUM SYSTEMS ANALYSIS - PSA	INTRODUCTION TO FIBER OPTICS FOR WELL SURVEILLANCE - IFOS INTRODUCTION TO GEOMECHANICS FOR UNCONVENTIONAL RESERVOIRS - IGUR FOUNDATIONS OF PETROPHYSICS - FPP	WELL TEST DESIGN AND ANALYSIS - WTA	WELL DESIGN AND ENGINEERING - WDE	COMPLETIONS AND WORKOVERS - CAW PRODUCTION OPERATIONS 1 - PO1 OPERATIONS AND DEVELOPMENT OF SURFACE PRODUCTION SYSTEMS - PO4 UNCONVENTIONAL RESOURCES COMPLETION AND STIMULATION - URCS	OIL WELL PAD FACILITIES (FOR FACILITIES ENGINEERS) - OWPF-FE PROJECT MGMT IN UPSTREAM FIELD DEVELOPMENT - FPM2 EVALUATING AND DEVELOPING SHALE RESOURCES - SRE
BASIC						MANAGING NON-TECHNICAL RISKS - MNTR OIL WELL PAD FACILITIES (FOR NON-FACILITIES ENGINEERS) - OWPF-NFE BASIC PETROLEUM ENGINEERING PRACTICES - BE BASIC PETROLEUM TECHNOLOGY - BPT

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

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

www.petroskills.com/unconventional

email unconventional@petroskills.com

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 Resources Completion and Stimulation
- Use of Full Azimuth Seismic and Microseismic for Unconventional Plays
- Well Test Design and Analysis
- Well Design and Engineering

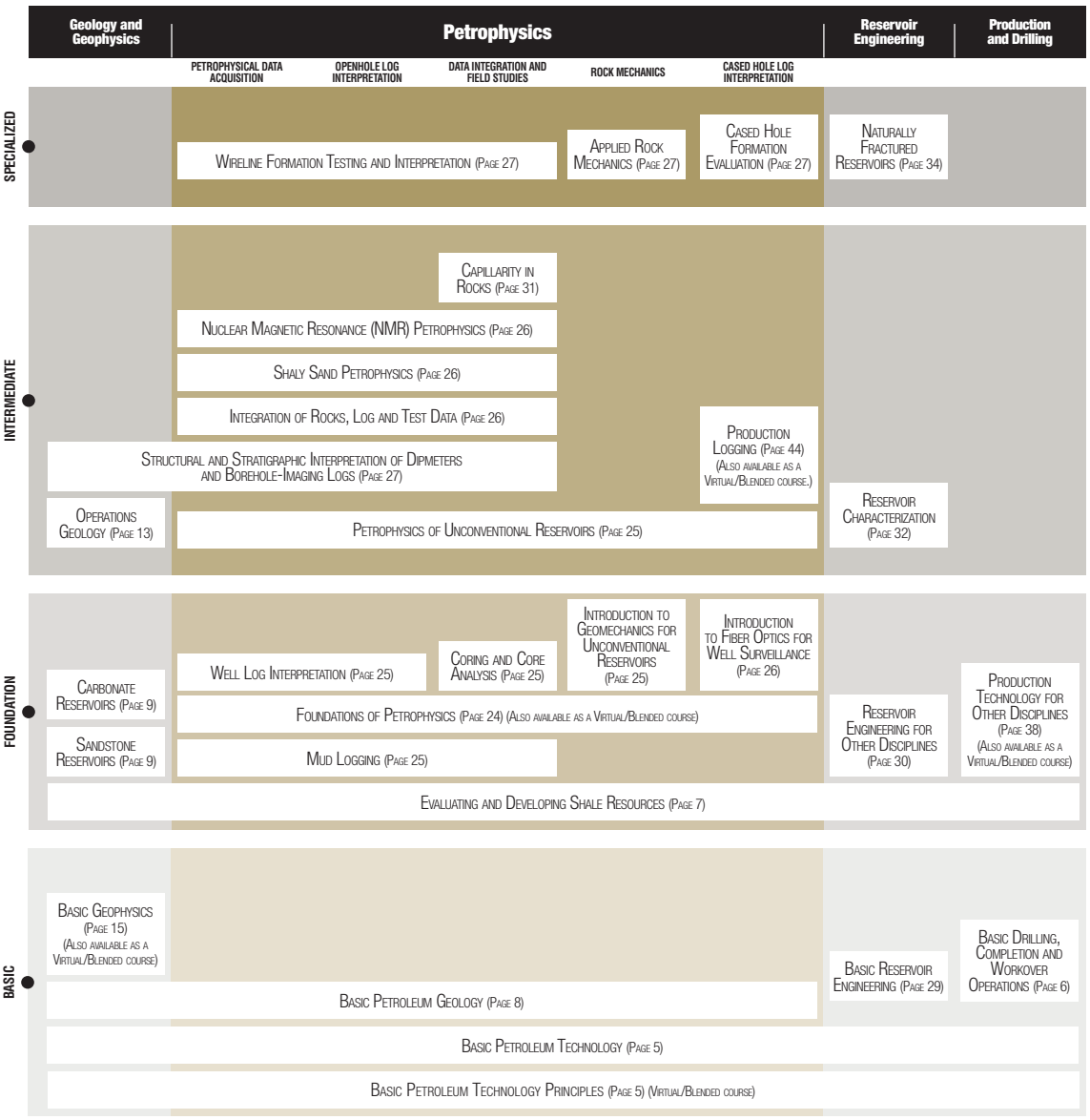
Petrophysics
Course Progression Matrix

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:

Dr. Ahmed Badruzzaman
Dr. Andrew Chen
Dr. Amr Elewa
Mr. Eric Foster
Ms. Laura Foulk
Mr. Jeff Hamman
Mr. Bob Lippincott
Mr. David Patrick Murphy
Mr. Roberto Peveraro
Dr. John Sneider
Dr. Carl Sondergeld
Dr. John Spivey
Dr. Jack Thomas



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 • Mudlogging • Core analysis, acquisition, interpretation, and quality checks • Theory and basics of resistivity, radioactivity, acoustic tools • LWD/MWD versus open hole logging • Determination of rock types using core and logs • Petrophysical impact on economic uncertainty • Evolving petrophysical technologies • Overview of cased hole logging

FPP is also available as a self-paced, online course.

ON-DEMAND COURSE $3500

PETROSKILLS.COM/FPPONLINE

2021 Schedule and Tuition (USD)

HOUSTON, US	4-8 OCT	$4475

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

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 reconnaissance techniques quickly and efficiently discriminate between water, oil, and gas. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Identify reservoirs
- Determine mineralogy, porosity, and saturation in various lithogies
- Recognize the importance of electrical properties of earth materials
- Highlight oil mobility
- Interpret pressure profiles
- Understand optimum tools and logging programs
- Apply quick-look methods of formation evaluation

COURSE CONTENT

Logging objectives • Invasion profile • Challenge of borehole geophysics • Passive electrical properties of earth materials • Resistivity measuring tools, normal, induction, 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 plot • Reconnaissance techniques, Rwa, FR/FP, logarithmic scaler • Porosity-resistivity crossplots • Permeability relationships • Nuclear magnetic resonance • Use of pressure measurements • Computerized log evaluation • Sidewall coring • Recommended logging programs

2021 Schedule and Tuition (USD)

DENVER, US	30 AUG-3 SEP	$4435
HOUSTON, US	13-17 DEC	$4440
LONDON, UK	8-12 NOV	$5165+VAT
PERTH, AU	20-24 SEP	$5375+GST
VIRTUAL	14-25 JUN	$3990

Coring and Core Analysis – CCA

FOUNDATION 5-Day

LAB VISIT

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 SEP †	$4585
VIRTUAL	26 JUL-6 AUG	$3990

† includes lab visit

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 calculations
- Describe the formation cuttings
- Integrate the cuttings evaluation with the drilling parameters
- Interpret all the acquired geological and engineering data at the rig site
- Evaluate the hydrocarbon potential of the formation
- *and more...*

2021 Schedule and Tuition (USD)

HOUSTON, US	4-8 OCT	$4410

Petrophysics of Unconventional Reservoirs – PUR

INTERMEDIATE 3-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Interpret petrophysical data gathering from unconventional reservoirs from both core and log data
- Assess TOC and maturity indicators
- Evaluate measurement provided by service companies
- Gauge gas-in-place and reserves in unconventional reservoirs
- Recognize consequences and magnitudes of shale anisotropy
- *and more...*

2021 Schedule and Tuition (USD)

HOUSTON, US	12-14 JUL	$3370

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 development.

YOU WILL LEARN

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 SEP	$4410

Introduction to Fiber Optics for Well Surveillance – IFOS

FOUNDATION 3-Day

NEW

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

Attendees will learn about the variety of conveyance and deployment methods for fiber deployment in wells. Hypothetical examples will be used to illustrate the different deployment cases. The course will give the 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 diagnostics
- Determine the optimal fiber interrogation units for your application
- Design a basic program for a fiber surveillance
- Understand the physics behind distributed fiber measurements
- Perform basic distributed temperature and acoustic interpretations
- Integrate fiber with other data forms to generate robust well diagnostics

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-28 JUL	$3310

Integration of Rocks, Log and Test Data – ILC

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DOHA	27 JUN-1 JUL	$5650
HOUSTON, US	8-12 NOV	$4510

Nuclear Magnetic Resonance (NMR) Petrophysics – NMRP

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)

2021 Schedule and Tuition (USD)

HOUSTON, US	9-12 AUG	$4050*

** plus computer charge*

Shaly Sand Petrophysics – APS

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DENVER, US	10-14 MAY	$4545

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

INTERMEDIATE 5-Day

FIELD TRIP

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Applications and types of dipmeters and borehole images • Data acquisition and processing • Quality control and artifacts • Generation and use of stereonets and rose diagrams • Quantitative analysis using cumulative dip plots, vector plots, and SCAT plots • In situ stress from borehole breakout and drilling induced fractures • Horizontal wells • Identification and classification of fractures, faults, sub-seismic scale faults, micro-faults, and unconformities • Fracture spacing and wellbore bias correction • Thin bed analysis and net-sand counts • Carbonate porosity and facies interpretation • Sedimentology from borehole images: burrows, cross beds, 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

2021 Schedule and Tuition (USD)

HOUSTON, US	12-16 APR	$4650

† includes field trip

Applied Rock Mechanics – ARM

SPECIALIZED 3-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	15-17 NOV	$3430

** plus computer charge*

Cased Hole Formation Evaluation – CH

SPECIALIZED 4-Day

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

DESIGNED FOR

Geologists, formation evaluations specialists, completion, reservoir 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
- Calculate water and steam saturations from Pulsed Neutron Capture (PNC) Logs
- Correct petrophysical calculations for the influence of shaliness
- Distinguish gas/steam from liquids
- Compute oil saturation directly from Carbon/Oxygen technique
- Locate water entry and judge zonal communication
- Judge where specialty methods, such as Log-Inject-Log 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 or variable salinity conditions in water and steam floods where PNC methods do not work, and direct neutron (PNN) methods to Locate oil/water, gas/liquid, or steam/liquid contacts • Compute water, oil and gas/steam saturation (in steam floods), and residual saturation using log-inject-log methods • Application of above in open-hole completions • Differences in saturation interpretation methods across vendors • Oxygen activation to locate water entry • Job planning and best practice parameters for successful monitoring

2021 Schedule and Tuition (USD)

HOUSTON, US	11-14 OCT	$4130

Wireline Formation Testing and Interpretation – WFT

SPECIALIZED 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Apply formation testing and sampling: technologies, applications, and limitations
- Understand how FTs work; configure tool strings and design/ 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, FWL, and compositional gradient; excess pressure plot for compartmentalization; normalization plot for depleted reservoir • Multiple well pressure trends for reservoir compartmentalization, continuity, and extent • Qualification and quantification of interpretation uncertainties • Mud filtration phenomena dynamics; dynamic gradient; supercharging; wettability/capillary effects • Optical property measurement of reservoir fluids and contamination control; sampling principles and fluid sample QA/QC procedures; in-situ fluid PVT analysis • Permeability test; mini-DST and VIT; practical aspects of well productivity and deliverability potential estimates

2021 Schedule and Tuition (USD)

DUBAI, UAE	30 MAY-3 JUN	$5750+VAT

Reservoir Engineering

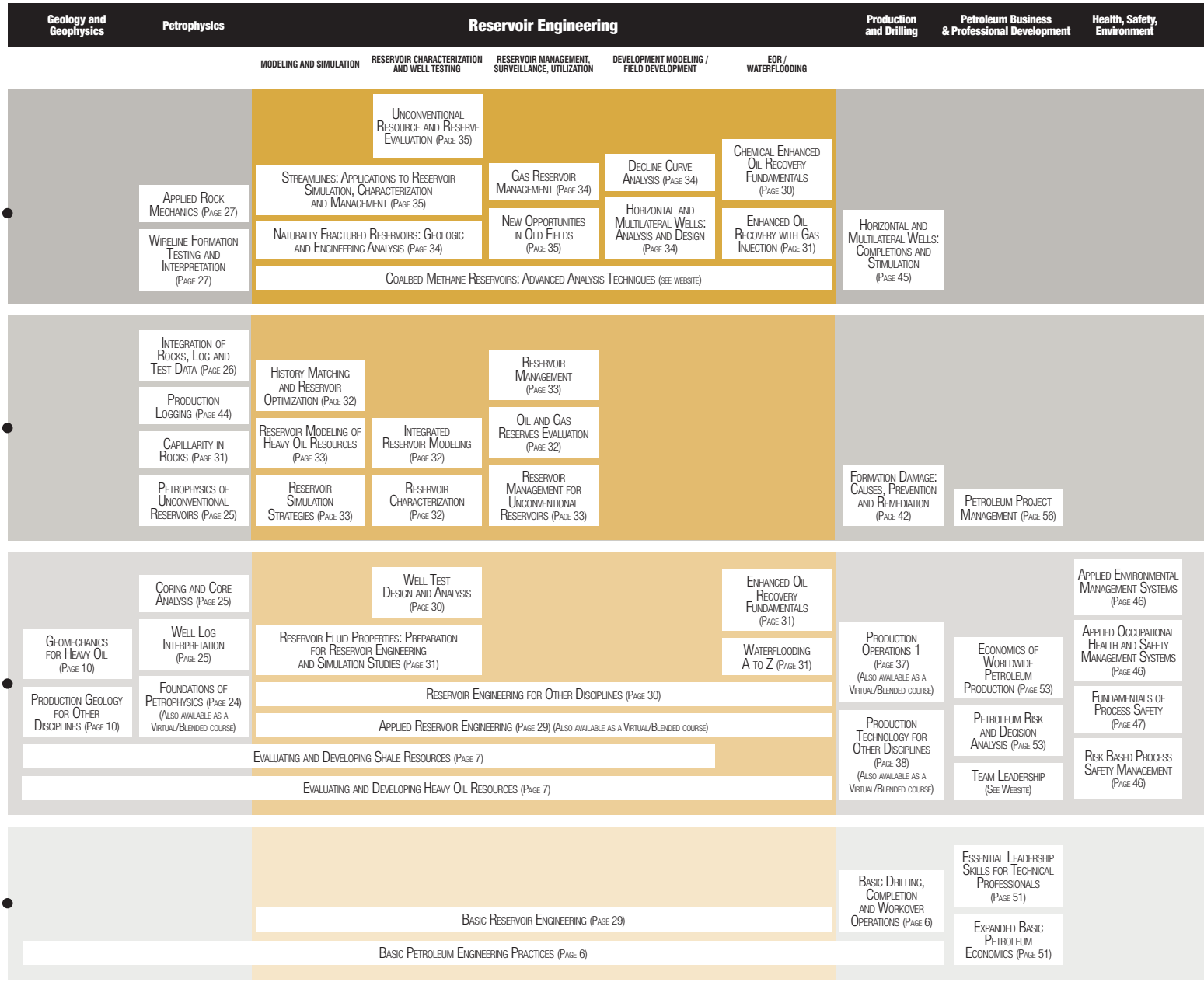
Course Progression Matrix

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

Basic Reservoir Engineering – BR leads off the section as a perfect basic overview for anyone working with reservoir definition, development, or production. The next course, **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. Rosalind Archer
Dr. Asnul Bahar
Dr. Akhil Datta-Gupta
Dr. Mojdeh Delshad
Dr. Iskander Diyashev
Dr. Chris Galas
Mr. Curtis Golike
Mr. Mason Gomez
Dr. Ton Grimberg
Dr. Greg Hazlett
Mr. Richard Henry
Dr. Chun Huh
Dr. Russell Johns
Dr. Mohan Kelkar
Mr. Stanley Kleinsteiber
Dr. Larry W. Lake
Dr. Kishore Mohanty
Mr. David Patrick Murphy
Dr. Grant Robertson
Ms. Deborah Ryan
Mr. Richard Schroeder
Mr. John Seidle
Mr. Rod Sidle
Dr. John Spivey
Dr. Dave Waldren



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

BR is also available as a live virtual course:

15 MAR-14 MAY 2021	**US$3890**
23 AUG-22 OCT 2021	**US$3890**

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

2021 Schedule and Tuition (USD)

DENVER, US	14-18 JUN	$4305
HOUSTON, US	29 NOV-3 DEC	$4310
VIRTUAL	12-23 JUL	$3890

Applied Reservoir Engineering – RE

FOUNDATION 10-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Asset life cycles, professional roles, hydrocarbon reservoir descriptions • Porosity, permeability, compressibility, capillary pressure, wettability and relative permeability, averaging reservoir property data • Phase behavior of reservoir fluids, gas properties, oil properties, water properties, PVT sampling, and understanding PVT laboratory reports • Calculate original hydrocarbons in-place with volumetric methods, build hydrocarbon volume vs depth relationships, and review reserve booking guidelines • Oil recovery material balance, Havlena-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 IPR relationships • Gas well testing: pressure, pressure squared, real gas pseudo pressure solutions, rate sensitive skins, multi-rate testing, gas well deliverability • Hurst van Everdingen, Carter Tracy, and Fetkovitch methods of aquifer analysis and description • Immiscible displacement: fluid displacement process, fractional flow, Buckley Leverett, Welge • 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: why simulate? Various simulation models, simulator types, setting up a simulator model

2021 Schedule and Tuition (USD)

CALGARY, CAN	13-24 SEP	$7620+GST
HOUSTON, US	1-12 MAR	$7720
	1-12 NOV	$7720
MIDLAND, US	2-13 AUG	$7620

** plus computer charge*

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

15 MAR-6 AUG	**US$6985**
23 AUG 2020-7 JAN 2022	**US$6985**

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

Applied Reservoir Engineering – RE

PetroSkills® PetroAcademy™

BLENDED LEARNING WORKSHOP STRUCTURE

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

Week	Hours (Approx)	Subject
1	1.0	Orientation Webcast
	1.0	This is Reservoir Engineering - Online Learning
2	9.0	Reservoir Rock Properties - Online Learning
	1.5	• Session 1
3	1.5	Reservoir Fluid - Session 1
	11.0	• Online Learning
	1.5	• Session 2
4	1.5	Reservoir Flow Properties Fundamentals - Session 1
	9.0	• Online Learning
	1.5	• Session 2
5	3.0	Reservoir Material Balance - Online Learning
6	1.5	Reservoir Material Balance - Session 1
	4.0	• Online Learning
	1.5	• Session 2
7	2.0	Decline Curve Analysis and Empirical Approaches - Sessions 1 and 2
	11.0	• Online Learning
8	6.0	Reserves and Resources - Online Learning
	4.0	Pressure Transient Analysis - 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	Reservoir Surveillance Fundamentals - Session 1
	6.0	• Online Learning
	1.5	• Session 2
16	6.0	Reservoir Management - Online Learning
	1.5	• Session 1
	3.0	Reservoir Management Fundamentals - Online Learning
	1.5	• Session 2

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

Reservoir Engineering for Other Disciplines – REO

FOUNDATION 5-Day

This course gives the non-reservoir engineer a better understanding of reservoir engineering practices and limitations. The course is designed to provide a good understanding of reservoir engineering processes, the required data, and the limitations on the 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 reservoir recovery efficiencies • Material Balance Methods: oil reservoir material balance, Havlena Odeh method, gas material balance, volumetric, compaction, water drive, and compartmentalized reservoirs • Fluid flow and well performance: radial and linear flow, transient, pseudosteady state, steady state flow regimes, productivity of vertical and horizontal wells • Aquifer influx • Immiscible Displacement: fluid displacement process, fractional flow, Buckley Leverett, Welge, water under running, and gas overriding • Coning and Cusping: description of process, critical rates, using horizontal wells • Reservoir Types and Drive Mechanisms: gas reservoirs - volumetric, water drive and compaction drive; oil reservoirs - solution gas drive, water drive, 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

2021 Schedule and Tuition (USD)

HOUSTON, US	8-12 NOV	$4410
KUALA LUMPUR, MYS	29 NOV-3 DEC	$5325
VIRTUAL	12-23 JUL	$3990
	18-29 OCT	$3990

** plus computer charge*

Well Test Design and Analysis – WTA

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	11-15 OCT	$4410

** plus computer charge*

Enhanced Oil Recovery Fundamentals – ORE

FOUNDATION 5-Day

One-third to one-half of the original oil-in-place may remain in a reservoir as it reaches abandonment due to its economic limit. This course covers the recovery improvement possibilities that present themselves at all stages in the reservoir life cycle. It thereby enables one to timely select the most beneficial method and set realistic expectations on 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 better understanding of various conventional and emerging technologies.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	6-10 DEC	$4410
LONDON, UK	9-13 AUG	$5135+VAT

Chemical Enhanced Oil Recovery Fundamentals – EORC

SPECIALIZED 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 JUL	$4610

** plus computer charge*

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 CO_2 Flooding.v

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

2021 Schedule and Tuition (USD)

HOUSTON, US	14-18 JUN	$4810

** plus computer charge*

Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies – RFP

FOUNDATION 5-Day

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

DESIGNED FOR
Reservoir, production and facilities engineers who have a need to model the flow of oil, gas and water through reservoirs, wellbores, 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 oilfield waters
- 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

See website for dates and locations.

Waterflooding A to Z
– WF

FOUNDATION 5-Day

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

2021 Schedule and Tuition (USD)

CALGARY, CAN	23-27 AUG	$4355+GST
HOUSTON, US	1-5 NOV	$4410
LONDON, UK	20-24 SEP	$5135+VAT
VIRTUAL	10-21 MAY	$3990

** 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 petrography • Saturation-height functions • Surface phenomena, capillarity, wettability, and interphase tension • The competition between capillary and gravity forces • Relationships between initial and residual saturations • Interpretation of single and multiple pore system rocks • Clay-bound water • Capillary pressure vs. NMR • Seal capacity

2021 Schedule and Tuition (USD)

HOUSTON, US	26-28	$3370
VIRTUAL	26 APR-7 MAY 18-29 OCT	$3055

** plus computer charge*

History Matching and Reservoir Optimization – HMRO

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

VIRTUAL	2-13 AUG	$4090

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	6-10 DEC	$4510

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 reliability 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 external inspection or internal historical records

COURSE CONTENT

Detailed examination of and instruction on 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/comment letters, bank lending evaluations • Economics and entitlements impact on reserves • Special topics: case studies, reserves in unconventional reservoirs and/or IOR/EOR projects, ethics

2021 Schedule and Tuition (USD)

DENVER, US	26-30 JUL	$4660
HOUSTON, US	11-15 OCT	$4665

** plus computer charge*

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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 SEP	$4510
VIRTUAL	12-23 APR	$4090

Reservoir Management – RM

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Apply the principles of sound reservoir management
- Use the interdisciplinary synergistic approach to efficient reservoir management
- Include each reservoir management component and the importance of timing and cost/benefit analysis
- Develop checks and balances

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DENVER, US	9-13 AUG	$4535
HOUSTON, US	23-27 AUG	$4540
VIRTUAL	15-26 MAR	$4090

** plus computer charge*

Reservoir Management for Unconventional Reservoirs – RMUR

INTERMEDIATE 5-Day

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

DESIGNED FOR

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types. The course is focused on reservoir management issues for tight gas, tight 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 & PBUs)

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DENVER, US	9-13 AUG	$4505
HOUSTON, US	18-22 OCT	$4510
VIRTUAL	26 APR-7 MAY	$4090

** plus computer charge*

Reservoir Modeling of Heavy Oil Resources – HORM

INTERMEDIATE 3-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

See website for dates and locations.

Reservoir Simulation Strategies – RSS

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Buckley Leverett displacement • One dimensional water oil displacement • Model components, types, and modern gridding methods • Two dimensional displacement • Grid orientation and refinement • Routine and special core analysis • Single phase up-scaling of geo-cellular model parameters

2021 Schedule and Tuition (USD)

LONDON, UK	11-15 OCT	$5235+VAT

** plus computer charge*

Decline Curve Analysis and Diagnostic Methods for Performance Forecasting – DCA

SPECIALIZED 2-Day

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

DESIGNED FOR

Engineers or technical assistants who are responsible for making forecasts of future production using decline 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, Stagg's, P/Z vs. Gp, etc.) for rate and reserves analysis
- Use advanced decline curve and production data analysis for reservoir characterization

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	14-15 JUN	$2725

** plus computer charge*

Gas Reservoir Management – GRM

SPECIALIZED 5-Day

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

DESIGNED FOR

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

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Gas reservoir fluid properties: gas condensate sampling and understanding laboratory reports • Gas reservoir fluid flow and well testing: deliverability testing and non-darcy flow, testing for 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, coalbed methane reservoirs

2021 Schedule and Tuition (USD)

HOUSTON, US	30 AUG-3 SEP	$4610
VIRTUAL	21 JUN-2 JUL	$4190

** plus computer charge*

Horizontal and Multilateral Wells: Analysis and Design – HML1

SPECIALIZED 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

See website for dates and locations.

Naturally Fractured Reservoirs: Geologic and Engineering Analysis – FR

SPECIALIZED 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	1-5 NOV	$4610

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 than can be realized with effective utilization of the natural drive mechanism(s) and the appropriate use of improved recovery methods
- Identify under-performing wells or field areas and recommend appropriate intervention
- Determine the upside potential of a field, distinguishing between incremental reserves and reserve acceleration
- Examine alternative re-development strategies by studying case histories and working example industry problems

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	16-20 AUG	$4610

** plus computer charge*

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
- Simulate flow and visualize results at the geologic model scale
- Calculate swept 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

COURSE CONTENT

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

See website for dates and locations.

Unconventional Resource and Reserve Evaluation – URRE

SPECIALIZED 5-Day

This five-day advanced course is designed to expose attendees to the understanding and application of the latest approaches, techniques, and requirements being applied to reserves evaluation within unconventional resources. Particular focus is given to actions and methodologies that are necessary to enhance the reserve categorization. Discussion and class examples will emphasize the testing protocols necessary within the exploration, appraisal, and development phases of the resource life cycle. The course is based around the Petroleum Reserve Management System (PRMS). Variations needed to conform to other national standards such as the SEC, NI-51, SORP, NPD, Chinese, as well as other standards, is taught as a stand-alone module. A majority of the offering is focused on shale oil and shale gas resources, with selected coverage of tight gas, coalbed methane, and coal seam gas plays 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 oil\gas, tight gas, CBM\CSG, and hybrid plays
- Compute gas\oil in place and estimated ultimate recovery in unconventional resources
- Design a data collection program appropriate within the exploration, appraisal and development phases of an asset life cycle
- Apply analysis of core analysis, well test data, and proximate analyses to enhance reserve estimation
- Describe the advantages and disadvantages between various reserve estimating techniques including decline curve, rate transient, and the probabilistic approach
- Differentiate between various reserve and resource accounting methods
- Differentiate between prospective resources, contingent resources and reserves
- Summarize the concepts of 'reasonable certainty' and 'reliable technology'
- Create a unconventional reserve growth portfolio
- Minimize unconventional reserve write-downs

COURSE CONTENT

Fundamentals of unconventional 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 evaluations • Reserve portfolio management • Alternate evaluation approaches • Ethics and public information releases

2021 Schedule and Tuition (USD)

DENVER, US	21-25 JUN	$4605
HOUSTON, US	13-17 DEC	$4610

** plus computer charge*

Production and Completions Engineering

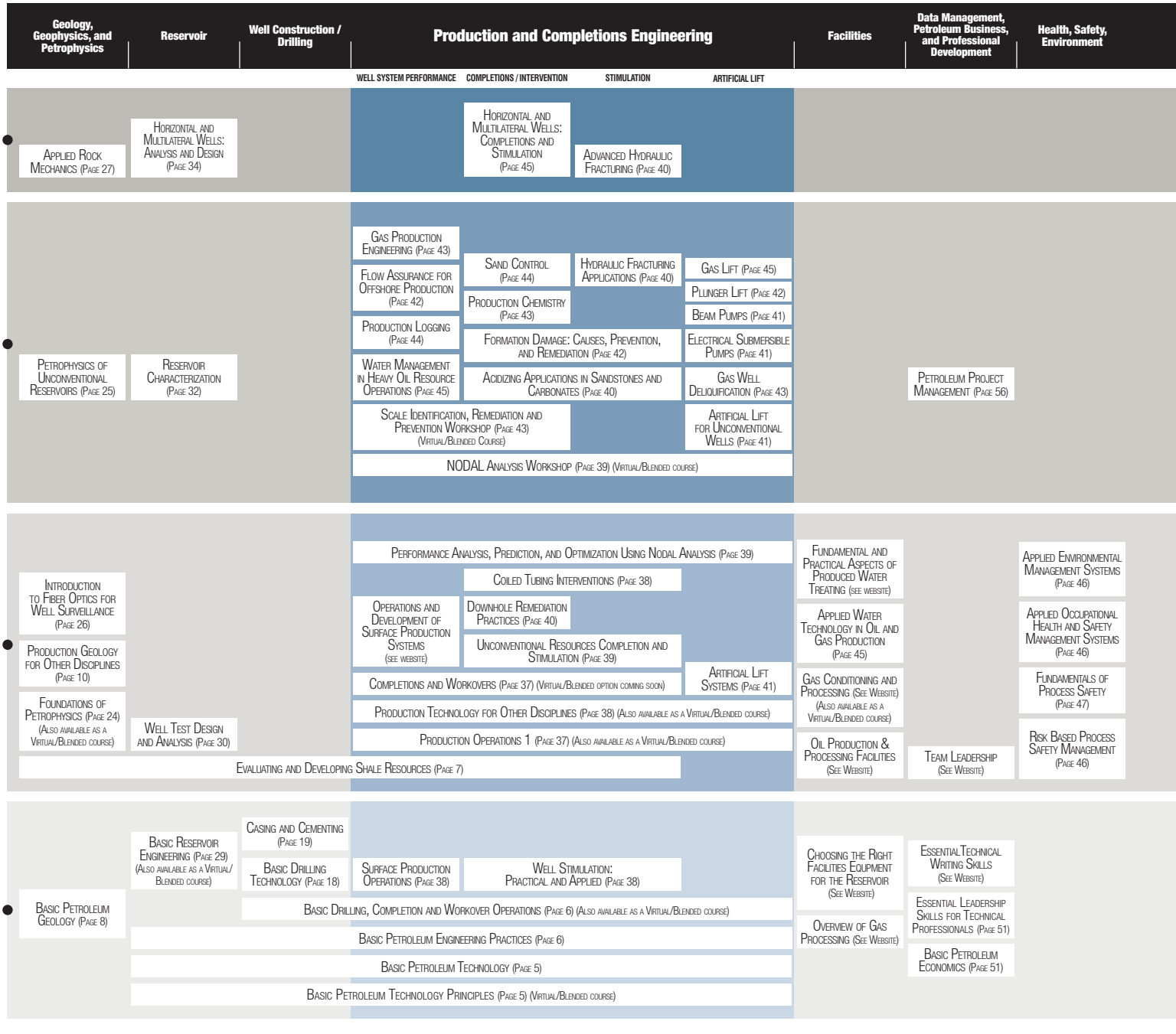
Course Progression Matrix

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:

Dr. Ahmed Badruzzaman
Dr. Omar Barkat
Mr. Paul Barry
Mr. Larry Britt
Dr. Iskander Diyashev
Dr. Shari Dunn-Norman
Dr. Dale Fitz
Mr. Rafael Gay-de-Montella
Dr. Ali Ghalambor
Mr. Dan Gibson
Mr. Mason Gomez
Mr. Larry Harms
Mr. Aaron Horn
Dr. Satish Kalra
Dr. Mohan Kelkar
Dr. James Lea, Jr.
Mr. Diego Londono
Mr. John Martinez
Dr. Howard McKinzie
Mr. Steve Metcalf
Mr. Manickam Nadar
Mr. Bob Nichol
Dr. Phil Notz
Mr. William Ott
Dr. Carlos Palacios
Dr. Cliff Redus
Mr. Kenneth Saveth
Mr. Richard Schroeder
Dr. Subhash Shah
Mr. Kyle Travis
Mr. Hugo Vargas
Mr. Bob Westermark
Mr. Scott Wilson



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.

4 OCT-3 DEC 2021 US$4390

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

PETROSKILLS.COM/BLENDEDCAW

2021 Schedule and Tuition (USD)

DENVER, US	12-16 APR	$4840
DUBAI, UAE	3-7 OCT	$6105+VAT
HOUSTON, US	11-15 OCT	$4850
LONDON, UK	8-12 NOV	$5650+VAT

Production Operations 1 – PO1

FOUNDATION 10-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Importance of the geological model • Reservoir engineering fundamentals in production operations • Understanding inflow and outflow and applied system analysis • Well testing methods applicable to production operations • Well completion 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...*

2021 Schedule and Tuition (USD)

CALGARY, CAN	24 MAY-4 JUN	$7895+GST
HOUSTON, US	19-30 JUL	$7995
	8-19 NOV	$7995
KUALA LUMPUR, MYS	1-12 NOV	$9595
LONDON, UK	16-27 AUG	$9260+VAT

** plus computer charge*

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

29 MAR-16 JUL 2021 US$6985

13 SEP-24 DEC 2021 US$6985

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

Production Operations 1 – PO1

PetroSkills® PetroAcademy™

BLENDED LEARNING WORKSHOP STRUCTURE

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

Week	Hours (Approx)	Subject
1	1	Orientation Webcast
	4	Production Principles
2		Well Performance and Nodal Analysis Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
3		Onshore Well Completion
	4	• Conventional
	4	• Unconventional
4	4	Primary and Remedial Cementing
	4	Perforation
5	4	Rod, PCP, Plunger Lift, and Jet Pump
6		Reciprocating Rod Pump Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
7	1.5	Gas Lift and ESP Pump
8		Gas Lift Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
9		ESP Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
10	4	Formation Damage and Remediation
		Matrix Acidizing Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
11	4	Flow Assurance and Production Chemistry
	4	Sand Control
12		Sand Control Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2
13	4	Hydraulic Fracturing
	4	Production Problem Diagnosis and Intervention Planning
14	4	Production Logging
		Production Logging Fundamentals
	1.5	• Session 1
	5	• Online Learning
	1.5	• Session 2

TO LEARN MORE, VISIT

PETROSKILLS.COM/PO1-BLENDED

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 SEP	$4435
KUALA LUMPUR, MYS	6-10 DEC	$5350
VIRTUAL	3-14 MAY	$3990

**plus computer charge*

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

2021 Schedule and Tuition (USD)

HOUSTON, US	2-6 AUG	$4310

Surface Production Operations – PO3

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

Properties of fluids at surface • Flowlines, piping, gathering systems; solids and liquid limits • Oil - water- gas - solids - contaminants • Separation and treatment • 2-3 phase separators, free water knockouts, centrifugal, filter • Storage tanks, gun barrels, pressure/vacuum relief, flame arrestors • Stabilizers • Foams, emulsions, paraffins, asphaltenes, hydrates, salts • Dehydrators • Water treaters: SP packs, plate interceptors, gas floatation, coalescers, hydrocyclones, membranes • Acid gas treatment: coatings, 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/Scales: inhibition and treatment

2021 Schedule and Tuition (USD)

DUBAI, UAE	12-16 DEC	$5450+VAT
HOUSTON, US	3-7 MAY	$4310
	1-5 NOV	$4310
VIRTUAL	16-27 AUG	$3890

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 corrosive 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 • CT drilling operations • Life estimation (fatigue) • Corrosion • String management • Checklists • Nitrogen • Emergency responses and contingencies

2021 Schedule and Tuition (USD)

DUBAI, UAE	7-11 NOV	$5550+VAT
HOUSTON, US	16-20 AUG	$4410
VIRTUAL	12-23 JUL	$3990

Unconventional Resources Completion and Stimulation – URCS

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	11-15 OCT	$4410

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 basics • Liquid in gas streams, what is a dry gas well, loaded wells, predicting temperatures

2021 Schedule and Tuition (USD)

DENVER, US	9-13 AUG	$4430
HOUSTON, US	7-11 JUN	$4435

** plus computer charge*

NODAL Analysis Workshop – NAW

PetroSkills® PetroAcademy™

COURSE DESCRIPTION

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

Virtual Schedule and Tuition (USD)

2-17 SEP 2021	US$3990

BLENDED LEARNING WORKSHOP STRUCTURE

- Virtual Instructor-led Training
- Online Learning Activity/Reading
- Exercise(s)

Week	Hours (Approx)	Subject
1	1	Kick-off Session: Overview
	4	Online Activity Overview
2	3	Inflow/Outflow Models in SNAP
	4	Exercises
	3	Components of Skin Perforating
	4	Exercises
3	3	Outflow Basics, Advanced Outflow, HZ and Frac
	4	Exercises
	2	Artificial Lift and Transient tests
	6	Integrated Problem Set
4	1	(Optional) Delta 1 and Delta 2
	1	Workshop Wrap-Up

TO LEARN MORE, VISIT

PETROSKILLS.COM/ NODAL-VIRTUAL

Downhole Remediation Practices for Mature Oil and Gas Wells – DRP

FOUNDATION 5-Day

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.

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.

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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 DEC	$4470

Hydraulic Fracturing Applications – HFU

INTERMEDIATE 5-Day

The course reviews the basic concepts of hydraulic fracturing and the broad applications of the technique. Fracturing technology benefits and limitations in all types of sandstone and carbonate 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.

DESIGNED FOR

Production, reservoir, and drilling engineers, and others who have a basic understanding of hydraulic fracturing and need to enhance their knowledge about fracturing concepts and applications.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Introduction to the fracturing process and mechanics • Fracture design concepts and methodologies • Fracturing fluid additives and proppant • Strengths and limitations of fracturing applications • Production increase • Factors involved in field implementation • Acid vs. proppant fracturing • Frac packing concepts • Waterfracing concepts • Horizontal well fracturing • QA/QC of fracturing treatments • Methods to evaluate fracturing treatment success

2021 Schedule and Tuition (USD)

HOUSTON, US	1-5 NOV	$4510
VIRTUAL	7-18 JUN	$4090

Advanced Hydraulic Fracturing – AHF

SPECIALIZED 5-Day

This advanced course is designed for those who have a practical understanding of the applications of hydraulic fracturing and want to expand their knowledge. The course 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 also 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.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 SEP	$4610
VIRTUAL	2-13 AUG	$4190

Acidizing Applications in Sandstones and Carbonates – ASC

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT	$4510
VIRTUAL	12-23 JUL	$4090

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

2021 Schedule and Tuition (USD)

HOUSTON, US	2-6 AUG	$4435
LONDON, UK	18-22 OCT	$5160+VAT

** plus computer charge*

Artificial Lift for Unconventional Wells – ALUW

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Understand the importance of identifying and agreeing on the objectives of production 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 use relevant PR 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/play

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 SEP	$4510

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, belts/ 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 • Belts • Sheaves • Gear box • Unit • Polished rod • Wellhead/ stuffing box • Rods • Pump • Tubing • Artificial lift efficiency • Heavy oil considerations • Gas separation/handling • Best operating practices • Component design • System analysis • Pump off controllers

See website for dates and locations.

Electrical Submersible Pumps – ESP

INTERMEDIATE 5-Day

ESPs 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 products, and best practices. 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 sytem 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

2021 Schedule and Tuition (USD)

MIDLAND, US	25-29 OCT	$4455

** plus computer charge*

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 (bypass), 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 • IPRs for plunger lift • Systems used to monitor plunger in the well • What systems to use when conventional plunger no longer works

See website for dates and locations.

Flow Assurance for Offshore Production – FAOP

INTERMEDIATE 5-Day

Flow assurance is a critical component in the design and operation of offshore production facilities. This is particularly true as the industry goes to deeper water, longer tiebacks, deeper wells, and higher temperature and pressure reservoirs. Although gas hydrate issues dominate the thermohydraulic design, waxes, asphaltenes, 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 techniques for: gas hydrates, paraffin (waxes), asphaltenes, emulsions, scale, corrosion, erosion and solids transport, and slugging
- Understand the elements of an operability report for subsea production facilities, flowlines, and export flowlines

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	6-10 DEC	$4510
LONDON, UK	13-17 SEP	$5235+VAT

** plus computer charge*

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, removed 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, completion, reservoir, and 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

2021 Schedule and Tuition (USD)

HOUSTON, US	29 NOV-3 DEC	$4510
KUALA LUMPUR, MYS	27 SEP-1 OCT	$5425

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 well 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 inflow 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, retrograde; reserve estimates, laboratory simulation; gas cycling • Field operations problems: interpreting P/Z plots; hydrate formation

2021 Schedule and Tuition (USD)

CALGARY, CAN	15-19 NOV	$4480+GST
HOUSTON, US	13-17 SEP	$4535
VIRTUAL	18-27 MAY	$4090
	19-28 OCT	$4090

** plus computer charge*

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 on 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 welss loading or not • Optimize techniques with nodal analysis • Sizing tubing • Compression: selection, sizing, and operation • Plunger lift: cotinuous (bypass), conventional and gas assisted • Use of foam to deliquefy gas wells • Hydraulic pumps • Use of beam pumps to deliquefy gas wells • Gas lift • Electrical submersible pumps • Progressive cavity pumps • Other methods to solve liquid loading problems

2021 Schedule and Tuition (USD)

HOUSTON, US	18-22 OCT	$4535

** plus computer charge*

Scale Identification, Remediation and Prevention Workshop – SIR

PetroSkills® PetroAcademy™

INTERMEDIATE

Scale Identification, Remediation and Prevention is an essential part of a production or workover engineer's scope of work. This workshop provides a comprehensive overview of dilemmas in operating producing and injection wells 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/LSI: Rice U ScaleSoftPitzer software • Scale prevention and inhibition

TO LEARN MORE, VISIT
PETROSKILLS.COM/SCALE-BLENDED-VIRTUAL

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 treating, 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, facilities 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 causes and control of foaming
- Predict scale forming conditions
- Select and apply scale inhibitors
- Control gas hydrate formation
- Predict and control paraffin (wax) deposition
- Evaluate methods for asphaltene control
- Scavenge low concentrations of H_2S
- 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 • Defoamers • Foam basics • Field application of foams • How defoamers work • Compounds that cause scaling • Prediction of scaling tendency • Scale inhibitors • Solvents to dissolve scales • Requirements for gas hydrates to form • Types of compounds used to control hydrate formation • Causes of paraffin (wax) problems • Paraffin treatment chemicals • Asphaltene stability tests • Asphaltene treatment chemicals • Chemicals used as H_2S scavengers • Application of H_2S scavengers • Oil carryover in water • Removal of oil and oily solids • Tests required for chemicals used in deep water • Green chemicals (environmentally friendly chemicals)

2021 Schedule and Tuition (USD)

HOUSTON, US	19-23 JUL	$4510

Production Logging – RMP

INTERMEDIATE 5-Day

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 tracers • 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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 DEC	$4510

** plus computer charge*

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

12 APR-28 MAY US$4090

Production Logging – RMP NEW

PetroSkills® PetroAcademy™

BLENDED LEARNING MODULE STRUCTURE

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

Week	Hours (Approx)	Subject
	1	Orientation Webcast
1	4	Production Logging Wellsite and Downhole Environment Core
2	7	Conventional Production Logging: Temperature and Single-Element Spinners Fundamental
	1.5	• Session 1
	1.5	• Session 2
3	7	Conventional Production Logging: Two-Phase Flow Fundamental
	1.5	• Session 1
	1.5	• Session 2
4	5	Production Logging in High Angle/ Horizontal Wells Fundamental
	1.5	• Session 1
	1.5	• Session 2
5	7	Advanced Nuclear Production Logging Fundamental
	1.5	• Session 1
	1.5	• Session 2
6	7	Special Purpose Production Logging Fundamental
	1.5	• Session 1
	1.5	• Session 2

TO LEARN MORE, VISIT

PETROSKILLS.COM/VIRTUALRMP

Sand Control – SNDC

INTERMEDIATE 5-Day

Sand causes a wide variety of costly problems when oil and gas are produced from unconsolidated reservoirs. The most costly problem is usually the loss of production resulting from formation damage caused by poorly planned and/or executed sand control applications. This course will identify the parameters that must be considered when selecting the sand control technique to be used. Examples, problems, and case histories will be examined to illustrate key points. Sand control failures will be used to illustrate the types of problems that can lead to early well failures. The course will also teach how to perform quality control checks during the sand control application to help insure successful wells. Because Sand Control in horizontal wells often proves to be short-lived when incorrectly applied, examples and class problems will focus on correctly choosing successful completion techniques for horizontal wells. Several new promising sand control technologies have been introduced in the last few years, such as expandable screens of 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 prepacking and enhanced prepacking • Frac packing • Open hole gravel packing • Expandable screens • Gravel pack performance • Horizontal well completions

2021 Schedule and Tuition (USD)

HOUSTON, US	11-15 OCT	$4510
LONDON, UK	2-6 AUG	$5235+VAT

Water Management in Heavy Oil Resource Operations – HOWM

INTERMEDIATE 3-Day

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

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 establishing, improving, optimizing, or supervising the implementation of technology improvements. This course will be useful to managers 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 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
- Synthetize and define the applicability conditions of technologies
- Troubleshoot field situations, learned from field cases, discussions, and debates in class
- Understand water mass and ionic/solids balance
- Estimate and calculate equipment requirements, predesign and specify equipment
- Predict efficiencies or performance of equipment, anticipate remediation of spills

COURSE CONTENT

Heavy oil review and basic definitions, heavy oil around the globe • Thermo-extraction produced water, the process (SAGD and CSS) ratios • De-oiling technologies, traditional, deviations, and future • Alkalinity and hardness concepts, softening and silica removal, hot and warm lime softening • Ion exchange softening technology, SACs and WACs technologies, the in and out of vessel regeneration • Boiler feed water final treatment, standard requirements and chemical conditioning • Evaporator alternatives and zero liquid discharge technology • Mining bitumen extraction, tailings pond, process affected waters, their treatment and reuse • Cooling tower requirements, water conditioning, and treatments • Deep well injection of waste water: requirements and treatment

See website for dates and locations.

Horizontal and Multilateral Wells: Completions and Stimulation – HML2

SPECIALIZED 5-Day

Successful multilateral and horizontal wells require new considerations, interdisciplinary planning, and special techniques. This intense course focuses on the critical need for a proper understanding of all aspects of 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

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

YOU WILL LEARN HOW TO

- Successfully design and optimize horizontal and multilateral well completions
- Engineer wells, taking into account limitations imposed by well bore stability and borehole friction
- Determine the appropriate zonal isolation methods for horizontal and multilateral wells
- Identify key components of fracture design and analysis in horizontal wells
- Design damage removal, stimulation, and workover operations

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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 APR	$4610

** plus computer charge*

Applied Water Technology in Oil and Gas Production – PF21

FOUNDATION 5-Day

This course provides an overview of the main water handling systems typically encountered in upstream (E&P) production operations, both onshore and offshore. The chemistry of the main water-related problems of mineral scales, corrosion, bacteria, and oily water will be reviewed both from the theoretical and practical aspects. Produced water treatment equipment and typical water quality specifications, 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 needing to understand water-related problems in oil and gas production and their solutions.

YOU WILL LEARN

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

COURSE CONTENT

Water chemistry fundamentals • Water sampling and analysis • Water formed scales • Corrosion control • Water treatment microbiology • Produced water discharge/ disposal and treatment principles • Produced water 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

2021 Schedule and Tuition (USD)

HOUSTON, US	26-30 JUL	$4410

Gas Lift – GLI

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

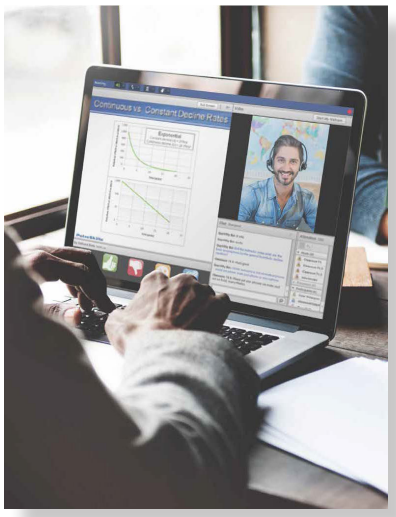
COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DUBAI, UAE	10-14 OCT	$5675+VAT
HOUSTON, US	27 SEP-1 OCT	$4535

** plus computer charge*



On-Demand Online Training Courses

Browse our library of on-demand courses for immediate training. This training format combines self-paced online modules with recorded instructor-led sessions, utilizing PetroSkills' knowledge, expertise, content, and technology to deliver world-class training to oil and gas professionals around the world. Benefits include reduced time to competency, no travel expenses, acces to a PetroSkills expert, and more.

HSE Courses - *Available On-Demand*

- Process Safety Engineering Principles: PSE Online

Online Skill Modules

More than 100 individual skill modules are available online. Work through them at your pace, whenever and whereever you need them.

Browse available HSE modules:

- Process Safety Risk Analysis and Inherently Safer Design
- Risk Analysis and Inherently Safer Design Fundamentals
- Process Hazard Analysis and Layers of Protection Analysis Techniques
- Process Hazard Analysis and Layers of Protection Analysis Fundamentals
- Leakage and Dispersion of Hydrocarbons
- Combustion Behavior of Hydrocarbons
- Sources of Ignition and Hazardous Area Classification
- Leakage and Dispersion, Combustion Behavior, Sources of Ignition Fundamentals
- Specific Plant Systems and Equipment
- Relief and Flare Systems
- Relief, Flare, and Depressurization Fundementals
- Historical Incident Databases, Plant Layout and Equipment Spacing
- Fire Protection Systems
- SIS, Monitoring and Control
- Historical Incident Databases and Metrics, Bad Actors (Specific Systems) Fundamentals

Risk Based Process Safety Management

– HS45

FOUNDATION 5-Day

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

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

DUBAI, UAE	12-16 SEP	$5550+VAT
HOUSTON, US	8-12 NOV	$4410
LONDON, UK	26-30 JUL	$5135+VAT
VIRTUAL	29 NOV-9 DEC	$3990

Fundamentals of Process Safety – PS2

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 PS4.

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

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)

2021 Schedule and Tuition (USD)

HOUSTON, US	4-8 OCT	$4410
LONDON, UK	22-26 NOV	$5135+VAT

Spill Control and Remediation Engineering – SCRE

FOUNDATION 3-Day

NEW

The first part of this course reviews the basics of spill control response principles, organization, procedures, and equipment used. Attendees will be introduced to evaluation of spills, organization of response and communications, surveillance and tracking, data records and information. The second part of this course will review the basics of remediation engineering applicable to property contaminated by crude and hydrocarbons. It will review the various technologies to treat spill-contaminated waters and soils. The course will finish with a review of solids handling for permanent disposal.

DESIGNED FOR

Operators and field managers, pipeline operators, loading and unloading personnel, and those involved with crude and hydrocarbon transportation. It will also benefit personnel involved in treatment of contaminated property or hard-to-dispose contaminated wastes. This course will be useful to managers in completion and optimization of operations. The course is an important reference parameter for safety situations where there might be involvement of governmental or civil protection.

YOU WILL LEARN

On Spill Control:

- To understand and analyze spill causes and most common situations
- Factors to consider when faced with a spill situation
- Priorities in the three-tiered response consideration, personnel requirements
- Equipment to control spills, basic principles and design, applicability of technologies
- Personnel risks and protective equipment
- Environmental effects and information to all at stake (Government, Municipal-Regional or other authority, Health and Safety)
- Investigation of root causes, decontamination of equipment and waste management

On Remediation Engineering:

- To detect contaminated land, migration phenomena, phase distribution
- To assess hydrocarbon's biodegradability, use gas chromatography and UV light properties
- Technology of air sparging biodegradation, in-situ soil vapor extraction remediation
- Ex-situ soil washing, bioremediation and phytoremediation advantages
- Bioremediation of metal contaminated soils
- Composting and vermiculture
- Electro kinetics, stabilization and solidification for final disposal

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, phytoremediation, composting, and permanent solidification and disposal

2021 Schedule and Tuition (USD)

HOUSTON, US	15-17 NOV	$3310

Your H&S competency will be recognized globally with Chartered Membership of IOSH!

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).

Designed 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.

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

For more details, see page 47 or

petroskills.com/hsp

PetroSkills®

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

2021 Schedule and Tuition (USD)

HOUSTON, US	16-20 AUG	$4095

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

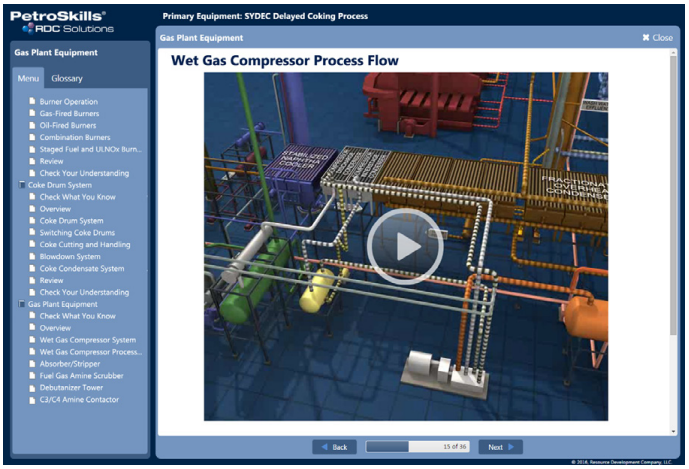
Work identification • Planning prioritization • Scheduling execution • History records • Optimizing preventive maintenance • Predictive maintenance planning • Critical equipment focus • Emergency response

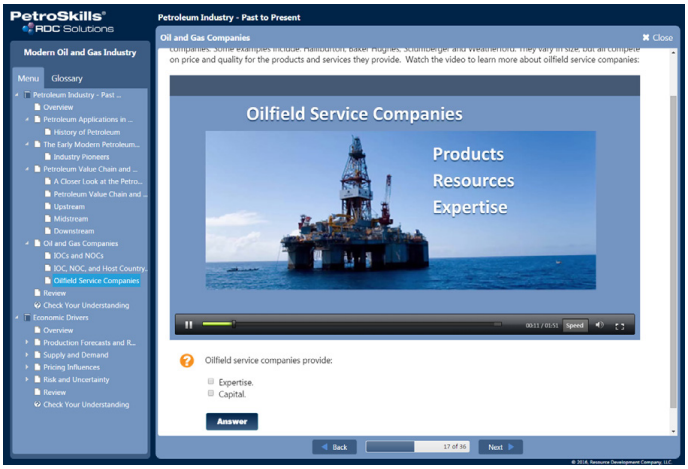
2021 Schedule and Tuition (USD)

HOUSTON, US	29 MAR-2 APR	$4195

How can you **accelerate competency** and **eliminate travel expenses**?

Add **e-Learning from PetroSkills** to your development programs!





ePilot™

Online Learning for Operations & Maintenance

ePilot™ is over 1400 hours of technical skills and safety training used at over 500 sites worldwide. Topics include:

- Core Competency
- Electrical
- Gas Processing
- Health, Environmental, Safety, and Security
- Instrumentation
- Mechanical Maintenance
- Pipeline Fundamentals
- Process Operations
- Production Operations
- Refinery Operations
- Refinery Process Units
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Designed specifically for the global Oil and Gas Industry

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Customization for Site Specifics

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Integrates with existing LMS/ERP systems - AICC/ SCORM Compliant

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

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

2021 Schedule and Tuition (USD)

HOUSTON, US	18-22 OCT	$4310
LONDON, UK	13-17 SEP	$5035+VAT
VIRTUAL	16-27 AUG	$3890

Essential Leadership Skills for Technical Professionals – OM23

BASIC 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 DEC	$4310

NEW COURSE

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.

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.

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 oganizational 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...*

2021 Schedule and Tuition (USD)

HOUSTON, US	16-19 AUG	$3890
VIRTUAL	19-29 JUL	$3510+VAT

Economics of Worldwide Petroleum Production – EWP

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Use cash flow techniques in economic evaluations
- Evaluate and choose investment opportunities
- Use models to weigh risk and uncertainty
- Evaluate 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, financial ratios, what is and is not included, reading between the lines • Worldwide business operations: concessions, licenses, production sharing contracts, joint ventures, cost of capital, sources of funding, debt and equity • Performance appraisal: buy/sell assessments • Computer economics software • Tips on format and inclusion of economic factors in computer spreadsheet analysis • Ethics in economic analyses

2021 Schedule and Tuition (USD)

LONDON, UK	6-10 SEP	$5135+VAT

Petroleum Risk and Decision Analysis – PRD

FOUNDATION 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Decision Tree Analysis: decision models, value of information (a key 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*

2021 Schedule and Tuition (USD)

HOUSTON	6-10 DEC	$4410
VIRTUAL	7-18 JUN	$3990
	20 SEP-1 OCT	$3990

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 decision tree capabilities. The course emphasis is on the evaluation concepts and techniques, rather than particular software programs.

DESIGNED FOR

Evaluation engineers, analysts, managers, planners, and economists. This course is intended for professionals involved with developing project evaluation, portfolio, and other forecasting and assessment models. Prior background in decision analysis is expected. Before registering, please visit http://www.decisionapplications.com/ada-pre-read/ to review a course prerequisites list and to take a short self-assessment quiz. You may 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 DA process for modeling; influence diagrams; judgements and biases; sampling error bias; sensitivity analysis; documentation and good modeling practices; real options overview • Monte Carlo Simulation: multi-pay prospect risking (similar to play analysis); calculating probabilities and distributions with simulation; modeling and optimizing investment portfolios; valuing added control and flexibility; stopping rules; ways to model correlation • Decision Tree Analysis: value of information review; sensitivity analysis; solving with utility for risk aversion • Decision Policy: portfolio optimization to maximize economic value; efficient frontiers; multi-criteria decisions; risk policy as a utility function; calculating expected utility and certain equivalent; insurance and hedging; optimizing working interests • Implementation: eliciting a decision maker's or organization's preferences for trade-offs among objectives, time value, and risk attitude; decision analysis presentation agendas and formats; special topics from the instructor's own research and experience

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 DEC	$4610
LONDON	11-15 OCT	$5335

** plus computer charge*

Cost Management – CM

FOUNDATION 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 price of our products fluctuates widely, the most vulnerable companies are those that are ineffective in understanding and managing their costs. The ability to properly manage costs is now paramount in a company's success and even their ultimate survival. As the energy industry goes through its most monumental changes since the 1970s, the companies that can identify efficiencies and inefficiencies will be able to react to the challenges of the global market place, thus generating higher profits. This seminar is an introduction to Practical Cost Management techniques designed to help the participant better understand the underlying dynamics of cost using recent events and trends, using relevant exercises, timely case studies and role-playing techniques.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Understand the different cost classifications and cost drivers
- Determine and monitor the behavior of costs
- Build your own activity dictionary
- Design management control system that works
- Understand the principles of Activity Based Cost Management (ABCM) 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 efficiencies • Developing productivity measurements that work • Operating Cost Management using the budgets efficiently and effectively Using GAP analysis in measuring productivity of costs • Support departments cost allocations Transfer pricing • Determining the break-even cost and volumes • Using variance analysis budget for monitoring performance • Optimizing the supply chain • Developing and analyzing capital investment projects Replace versus maintain • Life Cycle Costing • Using different scenarios to more effectively manage costs Performance • Measurement using capacity management techniques

2021 Schedule and Tuition (USD)

HOUSTON, US	29 NOV-3 DEC	$4410

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	24-28 MAY	$4460

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 cannot be negotiated without an effective understanding of the underlying economics. Negotiating strategies will determine contractual terms ultimately defining the economic benefits to be realized.

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

- Distinguish between different types of contracts
- Understand the economics terms of an E&P contract
- Determine the economic value of various contract terms
- Negotiate and assess the value of contractual terms

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT	$4510
LONDON, UK	13-17 SEP	$5235+VAT

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, contracts 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...*

2021 Schedule and Tuition (USD)

HOUSTON, US	13-15 SEP	$3310

Effective Materials Management – SC42

FOUNDATION 3-Day

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

DESIGNED FOR

Professional and management personnel who have responsibility for materials, spare parts, and 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...*

See website for dates and locations.

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

- How industry is structured, including host country and strategic relationships
- Business drivers and interface issues to be supported by procurement
- The role of industry economics in dictating procurement good practices in cost management
- Industry global compliance needs and how procurement can add value
- *and more...*

2021 Schedule and Tuition (USD)

HOUSTON, US	16-18 AUG	$3370

Supplier Relationship Management – SC63

INTERMEDIATE 2-Day

Continuous improvement in all aspects of the supply chain is necessary to remain competitive in today's global economy. The traditional adversarial relationship and transactional focus of buyers and suppliers cannot meet this demand for continuous improvement in lead-time, quality, and overall supplier performance. As a result, significant changes are occurring in the philosophies and approaches that define the relationship between purchasers and sellers in world-class organizations. 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...*

2021 Schedule and Tuition (USD)

HOUSTON, US	30 SEP-1 OCT	$2685

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

INTERMEDIATE 3-Day

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

DESIGNED FOR

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

YOU WILL LEARN

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	27-29 SEP	$3370

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 material to overnight mail. Maintaining a competitive position and even survival will depend on the organization's ability to use all of the continuous improvement strategies that have been developed to reduce cost across the entire supply chain for the life of the product or service. Fundamental to developing and implementing these strategies is knowledge of cost/price analysis, value analysis, and total cost of ownership concepts. This course provides the concepts that are essential skill sets in developing and implementing the strategies required to achieve the high levels of cost reductions possible from the supply chain. SC64 is also available as a 5-day in-house course with expanded content.

DESIGNED FOR

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

YOU WILL LEARN

- Importance of price/cost analysis in continuous improvement programs
- The difference between price and cost analysis
- Methods of price analysis
- How to manage volatile markets
- Use of Producer Price Indexes
- Methods of cost analysis
- Development of "Should Cost"
- Types of TCO models

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	4-6 OCT	$3370

Petroleum Project and Program Management Essentials – P3ME

FOUNDATION 3-DAY

NEW

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.

DESIGNED FOR

Project managers and engineers, facility engineers, operations and maintenance 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

- Apply essential work management techniques to a variety of tasks
- Identify key constraints and interfaces and develop action plans to address them
- Develop charters, 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

2021 Schedule and Tuition (USD)

HOUSTON, US	23-25 AUG	$3310
VIRTUAL	29 NOV-3 DEC	$2995

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

2021 Schedule and Tuition (USD)

HOUSTON, US	1-3 NOV	$3310
VIRTUAL	22-26 MAR	$2995

Petroleum Project Management: Principles and Practices – PPM

INTERMEDIATE 5-Day

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

DESIGNED FOR

Exploration and production personnel with a background in geoscience, petroleum engineering or drilling should attend. If you are a facilities engineer, we refer you to our Project Management for Engineering and Construction (FPM22) 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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT	$4510
LONDON, UK	8-12 NOV	$5235+VAT

** plus computer charge*

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 schedule and cost management, risk mitigation, and the proper use of scarce resources (people and materials) will help you make better decisions. Upon completion you will know how to improve engineering and service discipline work relations, use execution plans to integrate the work, and effectively employ cost and schedule control tools.
This course is taught using a combination of instruction, facilitated discussion, and indepth exercises based on the instructor's petroleum development successes and failures. The exercises will include both individual and group activities that provide you with a practical application of the principles and practices necessary to keep your project on track.

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	25-29 OCT	$4510
VIRTUAL	10-21 MAY	$4090
	11-22 OCT	$4090

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

2021 Schedule and Tuition (USD)

HOUSTON, US	29 NOV-3 DEC	$4510

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, midstream, and downstream 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 the steps 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 progress 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 is it 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...*

2021 Schedule and Tuition (USD)

HOUSTON, US	2-4 AUG	$3370

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 onshore and offshore developments. Case studies include deep-water projects with complex production components, as well as unconventional shale projects that require significant infrastructure investment.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2021 Schedule and Tuition (USD)

HOUSTON, US	13-17 SEP	$4510

Advanced Project Management – FPM62

SPECIALIZED 5-Day

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

YOU WILL LEARN HOW TO

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

2021 Schedule and Tuition (USD)

HOUSTON, US	20-24 SEP	$4610

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

See website for dates and locations.

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 (NOCs & IOCs) 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 PMC

2021 Schedule and Tuition (USD)

DUBAI, UAE	26-28 SEP	$4285+VAT

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 end 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 occur
- *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, earned value, buildup of field indirect charges, 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...*

2021 Schedule and Tuition (USD)

HOUSTON, US	15-17 NOV	$3430

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

2021 Schedule and Tuition (USD)

HOUSTON, US	29 NOV-1 DEC	$3430

PetroSkills®

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

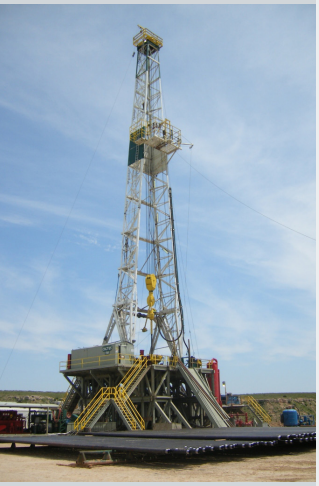
Skillful and competent leadership is extremely important for safety, productivity, and asset management. The 21st century brings new emphasis on leaders, new communication technologies, increased focus on safety, information overload, workforce dynamics, asset integrity, and many other concerns which 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!

MDT MULTI-DISCIPLINE TRAINING
G GEOLOGY
GP GEOPHYSICS
W/D WELL CONSTRUCTION/DRILLING
PP PETROPHYSICS
RES RESERVOIR ENGINEERING
P&C PRODUCTION AND COMPLETIONS ENGINEERING
HSE HEALTH, SAFETY, ENVIRONMENT
O&M OPERATIONS & MAINTENANCE
DATA PETROLEUM DATA MANAGEMENT
PB PETROLEUM BUSINESS
SC PROCUREMENT/SUPPLY CHAIN MANAGEMENT
PM PROJECT MANAGMENT
PPD PETROLEUM PROFESSIONAL DEVELOPMENT

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 world-wide. His skills then transferred to the oil and gas industry. He re-trained from 1980-1987 as a drilling supervisor, then worked in staff-based positions with Shell International and BP until 1993. Further skills, knowledge, and experience were gained in various global consultancy positions from 1993-2015. Peter worked in frontier Exploration Appraisal and Development subsea, deepwater, HPHT, and horizontal drilling projects. He often worked with complex wells. Project-based work experience was gained in the early 1990's 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, Faeroes, 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), Centrica (Norway), and Providence Resources (Ireland). His drilling speciality 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 Marine 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. W/D

MR. JEFFREY (JEFF) ALDRICH is a Vice President and Senior Geoscientist with MHA Petroleum Consultants Inc., a Denver-based petroleum consulting firm. He has over 30 years of global oil and gas experience working from frontier exploration through appraisal and large development projects. His expertise is in unconventional reservoirs, prospect evaluation, reserve determinations and multi-discipline and multi-culture team dynamics. Prior to joining MHA, he held various management and technical positions with Dart Energy, an Australian global unconventional gas company, Greenpark Energy, a UK CBM company, PetroSA, the South African national oil company, Forest Oil, Maxus Energy and Pennzoil Oil and Gas Company. He has a BS in Geology from Vanderbilt University and an MS in Geology from Texas A&M University. He is an active member in the AAPG, SPE, RMAG, DWLS, DIPS and is a Certified Petroleum Geologist (#3791). He is author or co-author of over 25 papers and/or technical presentations. G RES MDT

DR. ROSALIND 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, PTT 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, Austrial Pacific Energy, Greymouth 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. RES MDT

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 gradient 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. W/D

DR. AHMED BADRUZZAMAN holds a PhD in Nuclear Engineering and Science from Renssekaer Polytechnic Institute, Troy, NY, and has spent 35 years in the energy field leading research, application, and instructing cased and open-hole nuclear techniques. With Pacific Consultants and Engineers, based in California, Ahmed consults for the USDOE on assessing alternatives to radionuclide logging sources. He is also a Visiting Scholar at University of California in Berkeley, CA, where he advises the university of educational curriculums on nuclear logging and studies related to advanced techniques. As a scientist for Chevron (1991-2012), Ahmed excelled in his role of Internal Consultant on Nuclear Logging by developing the industry-standard three-phase algorithm to compute oil-saturation in steam floods, led R&D to assess nuclear tool response in complex environments using modeling, patented a non-chemical sources pseudo-density concept, pioneered the multiple-detector pulsed neutron tool idea for cased-hole applications, and developed the corporation's nuclear logging source safety guide. Ahmed's work experience also includes leading R&D for Sandia National Laboratories, Schlumberger-Doll Research, and Babcock & Wilcox, instructing a Graduate course at Berkeley (2001-2009), and consulting for International Atomic Energy Agency (IAEA) on their draft Well Logging Source Safety Guide (2011-2012). Dr. Badruzzaman is the author of over 40 papers, holds two patents, is the recipient of several SPE/SPWLA awards, and is currently writing a textbook on nuclear logging. He also holds prestigious titles within the industry including Fellow of the American Nuclear Society, former SPE Distinguished Lecturer, SPWLA Distinguished Speaker, chairman of the SPWLA Nuclear Logging SIG, former chairman of the SPE DL Committee, former VP of Publication of SPWLA, and former editor of Petrophysics. P&C PP

DR. ASNUL BAHAR has been developing and implementing new techniques for reservoir field studies and related fields for 10 years. For 4 years he has been teaching courses relating to Geostatistics for integrated reservoir modeling. Dr. Bahar is proficient in using commercial software (PETREL) and 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 Integration and History Matching, Fracture Modeling and Integration into Reservoir Model, UAE Reservoir Evaluation, Integrated Reservoir Characterization and Flow Simulation, and more. Dr. Bahar has a PhD in Petroleum Engineering from the University of Tulsa as well as an MS in Petroleum Engineering. Dr. Bahar received his BS in Mechanical Engineering from the Institut Teknologi Bandung in Indonesia. RES

DR. OMAR BARKAT is a registered and licensed Professional Engineer and the Executive Director for Upstream Operations with PetroProTech. He has been a training specialist and technical consultant for OGCI-PetroSkills since 1997. He has over 28 years of combined industrial and academic experience in the USA, North Africa and Europe. He has been an active international oil and gas consulting engineer since 1993 involved in projects related to surface production operations, upstream facilities, field development, oil and gas production systems performance optimization, equipment selection, petroleum fluids treating and processing and fluids disposal management. From 1980 to 95, he worked on several oil and gas production technical issues and led research and development projects in areas such as: cement slurries, hydraulic fracturing fluids, proppant transport, emulsions, drilling muds, formation damage, cutting transport, H_2S/CO_2 corrosion, fluid flow and rheology, drag and pour point reducing agents and petroleum processing. He has successfully designed and delivered several short courses, seminars and lectures in a variety of oil and gas topics throughout the world. He is a former tenured university full professor in Louisiana and Oklahoma, a current member of several international societies including SPE, AIChE, ACS and ASEE, and a member of the US National Engineering Honor Society Tau Beta Pi. He is an invited 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 professorship, 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 Polytechnique School of Algiers, an MS and a PhD from the University of Tulsa. P&C MDT

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 exploitation planning and multi stage, fractured horizontal well completion practices. Previous experience has been as a field production engineering manager of an onshore oilfield re-development/brownfield project for PDVSA and partners in Venezuela which required a combination of gas lift, submersible pump, and rod pump artificial lift completion technology, and frac pack sand control well completions. Previous Indonesia experience was in the design and completion of dual string, multiple selective, underbalanced, TCP high pressure gas wells, artificial lift oil well completions, and exploration well testing and evaluation for Pertamina and ARCO partners for Bontang LNG gas supply operations. As district reservoir engineer for Pertamina and Arco partners in Indonesia, Mr. Barry was responsible for the plan of development and reserves determination and certification for a 1.3 TCF offshore Bali gas field. He has also worked as a field engineer in Saudi Arabia for Aramco, responsible for a 1.2 MMBWD reservoir pressure support injection well system and injection water quality, producing well gravel pack completions, corrosion control systems, and, as Mobil Oil facilities engineer in the Aramco Gas Projects department. He has represented company technical and commercial interests in both UK and Norwegian North Sea sector oil and gas producing fields. Mr. Barry has served as an officer in the Jakarta and Dubai SPE sections. He holds a BSCE from the University of Notre Dame and an MSCE from Marquette University, and is a registered Professional Engineer in Colorado, USA. P&C

MR. PETER BARTOK is an Adjunct Professor of Geology at the University of Houston and a Petroleum Exploration Consultant with research interests in unconventional shale resources, complex salt tectonics, and the application of rock physics to exploration. His experience with BP included project management for Latin America and US Chief Onshore Geologist as well as research investigations related to high sensitivity aeromagnetics in Europe, Canada and the Gulf of Mexico. He also performed studies on the role of CO_2 and diagenesis in the sub-salt of the southern North Sea. He has evaluated prospects in over 40 basins of the world in Latin America, Europe, China and West Africa. He defined the exploration technique that led to the discovery of the Pinda carbonates in Angola. Mr. Bartok received BS and MS degrees from the State University of New York. He has worked as a geophysicist for over 20 years and published over 20 articles. G GP

MR. ROBI BENDORF, CPSM, MCIPS, CPM, M.Ed., has over 35 years of purchasing and sales experience, involving domestic and international activities, for a broad range of manufacturing and service businesses. He has extensive experience in consulting and training in purchasing, contracts, reengineering the supply management process, the management of procurement functions, global sourcing of materials and components, reducing cost of purchased materials and services, and negotiation of complex transactions and contracts. He has held purchasing and contracts management positions in high volume manufacturing, subcontract, job shop, and service 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 (ISM/NAPM), 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 CPSM, and also holds the MCIPS Certification as awarded by 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. SC

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 gas 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 high-pressure/high-temperature operations throughout the lower 48 states. Bobo 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. W/D

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-involved 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. He has authored numerous refereed papers, which have 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 associate editor of the Bulletin and Geology. Dr. Boyer is a Member and Fellow of the AAPG, where he has also served as associate editor of the Bulletin. G

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 Medallion 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 honored him as a Distinguished Lecturer. He 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. PM

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 stimulations and integrated field studies 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 Forum Committees on Gas Reservoir Engineering and Hydraulic Fracturing. In addition, Larry has authored over forty technical papers on reservoir management, pressure transient analysis, hydraulic fracturing, and horizontal well completion and stimulations. He is a graduate of the Missouri University of Science & Technology (MS&T) where he has a BS in Geological Engineering and a Professional Degree in Petroleum Engineering. He is an adjunct professor in the Petroleum Engineering Department at MS&T where he also serves on both the Petroleum Engineering and University Engineering Advisory Boards and is a member of the Academy of Mines and Metallurgy. P&C

MR. ROBERT (BOB) BRUNE is a technology-oriented Geophysicist with wide ranging experience in E&P and extensive experience in seismic acquisition. His focus in seismic acquisition has always been on challenging surveys, and the development and use of technology, primarily in operational groups. He has worked at GSI, Amoco, USGS, Sohio/BP, TGS-Nopec, 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/BP; and VP Operations, President-Offshore, and Chief Geophysicist at TGS. Bob's experience in recent years has included the diversity of: marine streamer survey operations and design; airgun array designs; TZ and shallow water operations and design; land survey operations; vibroseis interaction; frac monitoring techniques; rotational seismic for several applications; and a range of environmental / regulatory issues for both land and marine. He has a BS in Geology from the University of Missouri at Rolla, an MS in Geophysics from Stanford University, an MS in Computer Systems from University of Denver, along with extensive training and education in petroleum engineering, chemistry, math, and engineering. GP

DR. MICHAEL BURIANYK is currently an independent geophysicist pursuing various projects in the field of geophysical education and training. He has held several highly 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

Discipline icon legend on page 60

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 deposition, 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 reservoir description and formation evaluation. Dr. Chen has 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 WFT interpretation and application 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. PP

DR. STEVE CHEUNG is the President of StevelOR 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 shutoff. He taught in-house classes and trouble-shot 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 the SPE Global Training and Soft-skills Committees. 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. P&C

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 characterization of reservoirs. He has published 5 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, CHOA (Canadian Heavy Oil Association), APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta) and TBPG (Texas Board of Professional Geoscientists). Mr. Chopra holds a Masters of Philosophy in Physics (1978) and a Master's of Science in Physics (1976). G GP

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 Instructor for Drilling and Completion Fluids, Multi-Service Field 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. W/D

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 Carll 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 2006) and the AIME Rossitter W. Raymond Award (1992). He is co-author of the SPE textbook Streamline Simulation: Theory and Practice.' He received a Ph.D. degree from the University of Texas at Austin. RES

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, property 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 has approximately 90 technical papers in these areas. She is in charge of UTCHEM development and user support. She is a Review Chairman for the SPE Journal of Reservoir Evaluation and Engineering. Dr. Delshad has a BS in Chemical Engineering from Sharif University in Iran, and an MS and PhD both in Petroleum Engineering from The University of Texas at Austin. RES

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 Russia. 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, co[illegible]ing, 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 Moscow 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. GP RES P&C MDT

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 well completions and workovers. She has taught artificial lift, production engineering 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 USDW'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. P&C

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 authored or co-authored many 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. PP

DR. DALE FITZ has 36 years of experience as a petrophysicist 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 providing petrophysical support for extended reach high-angle/horizontal drilling programs and providing cased-hole nuclear and production logging support for difficult production challenges world-wide. During this time, he was heavily involved in developing and delivering training worldwide to ExxonMobil and affiliates on basic well logging, cased-hole nuclear

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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 Petrophysicists 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. P&C

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 new hire and continuing education internal seminars for Marathon. She has numerous technical publications and her society affiliations include SPWLA, DWLS, 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. PP

DR. THEODORE (TED) FRANKIEWICZ has over 30 years of experience in the oil industry with Occidental Petroleum, Unocal Corp., Natco Group (now Cameron), and currently, SPEC Services, Inc. He has a Ph.D. in Physical Chemistry from the University of Chicago, holds 15 patents, and has authored over 25 professional publications. At Unocal, he was responsible for developing the water treatment systems, which were installed in the Gulf of Thailand to remove mercury and arsenic as well as residual oil from the produced water. At Natco Group he developed an effective vertical column flotation vessel design and used CFD to diagnose problems with existing water treatment equipment as well as to design new equipment. He was an SPE Distinguished Lecturer on Produced Water Treatment in 2009-10, and serves on the SPE Steering Committee for their Global Workshop Series on Water Treatment. His field/operational experience in oilfield chemistry, design of process equipment, and the development of process systems has provided him with unique insights into the issues that challenge operators as their water production and water treatment complexity and cost escalates over time. P&C

DR. CHRIS 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. RES

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 HC-steam mix injection in wells. He is an expert in water treatment and water conditioning both for industrial and for municipal applications. Recently, Rafael has been involved in water treatment of fracking waters and is proficient in using OLI, 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. P&C

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 Distinguished Achievement Award for Petroleum Engineering Faculty, Production and Operations Award, Distinguished Service Award, DeGolyer Distinguished Service Medal, and the Distinguished Member Award by the Society of Petroleum Engineers. Dr. Ghalambor served as a 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 on the SPE Board of Directors and Chairman of the SPE International Symposium and Exhibition on Formation Damage Control. He received a PhD from Virginia Polytechnic Institute and State University and an MS and BS from the University of Southwestern Louisiana. He is a registered professional engineer. P&C

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 style focuses on first principles and developing an understanding of why things happen which then dictates an appropriate response. P&C

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 Completions, Reservoir, and Drilling disciplines, and helps support the overall organization as VP, Learning. P&C RES MDT

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 extensively on carbonate reservoir characterization issues, including as lead editor of AAPG Memoir 80 'Integration of Outcrop and Modern Analogs 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. G

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, regional synthesis, and prospect and play evaluation. He holds his PhD from Monash University in Australia, and a BS and MS from of University of Illinois at Champaign-Urbana. G

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.

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He has served in roles from a Project Drilling Engineer to a Project Manager. Responsibilities have included project management and drilling 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 Project Management Institute (PMI). Mr. Hackler holds a BS degree in Petroleum Engineering & Technology from Oklahoma State University. W/D

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 extensive experience in design, construction, risk management 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. PM

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 Corillins 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). PPD

MR. JEFF HAMMAN consults on subsurface characterization and provides training and technical mentoring. He had 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. PP

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 also was leader of the Gas Lift Optimization Team at 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 deliquification. He received a BS in Chemical Engineering from Oklahoma State University. P&C

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. G

DR. 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 India, steamfloods in California 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. RES MDT

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 determination, 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). RES

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. MDT

MR. ALAN HIPPMAN, CEng, FIMechE, IntPE (UK), SPE, is a resident of Colombia, having lived in Venezuela, 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 company experience globally with Hunting Oilfield Services. In 1981 Alan 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 Alan 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 retired from BP at the end of 2009, and has been working as 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 Managerial 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. W/D

DR. CHUN HUH is a well-known expert in process modeling, EOR simulator development, and the use of simulation for process design and scale-up for surfactant flooding, polymer flooding, miscible and foam flooding, and heavy oil recovery from unconsolidated sands. He joined the Department of Petroleum and Geosystems Engineering of UT-Austin as a Research Professor after working for many years as an Engineering Advisor at ExxonMobil Upstream Research Co. in Houston, participating and making key contributions in all areas of enhanced oil recovery (EOR). Currently, at UT-Austin, he is actively involved in all aspects of EOR research, collaborating with a number of professors. He received a BS degree from Seoul National University and a PhD from the University of Minnesota, both in chemical engineering. RES

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. MDT

DR. RUSSELL T. JOHNS is the George E. Trimble Chair of Energy and Mineral Sciences at the Department of Energy and Mineral Engineering at The Pennsylvania State University. He also holds the Energi Simulation Chair in Fluid Behavior and Rock Interactions. He recently served as Chair of the Petroleum and Natural Gas Engineering Program from 2015 - 2018. He is currently the Editor-In-Chief for SPE journals. Prior to his current position, Dr. Johns served on the

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petroleum engineering faculty at The University of Texas at Austin from 1995 to 2010. He also has nine years of industrial experience as a petrophysical engineer with Shell Oil and as a consulting engineer for Colenco Power Consulting in Baden, Switzerland. He holds a BS degree in electrical engineering from Northwestern University and MS and PhD degrees in petroleum engineering from Stanford University. He has over 200 publications in enhanced oil recovery, thermodynamics and phase behavior, unconventional gas engineering, multiphase flow in porous media, and well testing. Dr. Johns received the SPE Ferguson medal in 1993 and served as Co-Executive Editor for SPE Reservoir Evaluation and Engineering journal from 2002-2004. In 2009, he was awarded the SPE Distinguished Member award and in 2013 the SPE Faculty Pipeline award. He also received the 2016 SPE international award in Reservoir Description and Dynamics. He is currently director of the Enhanced Oil Recovery consortium in the EMS Energy Institute at Penn State University. RES

DR. HOWARD D. JOHNSON is a Shell Professor of Petroleum Geology at the Imperial College London. His extensive experience in the Petroleum Geology industry includes research, exploration and production geology, sedimentology and petroleum engineering. He also has wide experience in delivering technical courses, including Development Geology, Sedimentology, Reservoir Characterization and Modelling and Basin Analysis. He consulted for many companies such as BP, ExxonMobil, Shell and PETRONAS. His involvement within the industry goes on to include many technical publications, membership several professional bodies, such as SPE, AAPG, and PESGB, and participation on several societal and industry committees. He received a BS in Geology from the University of Liverpool and a PhD in Geology with focus on Sedimentology from the University of Oxford. He spent a few years as a research fellow at the University of Leiden and the University of East Anglia where he was involved in sedimentology research. G

DR. SATISH K. KALRA is a petroleum engineer with over 25 years of management, operations, teaching, research, and consulting experience with national and private oil companies. As an Associate Professor of Petroleum Engineering, he taught graduate and undergraduate students at the University of Southwestern Louisiana, Lafayette. He also worked for the University of Texas at Austin. His career includes assignments with ONGC (National Oil Company of India), ARCO Offshore (now BP), BJ Services, Agio Oil and Gas, Schlumberger / Holditch, Miller and Lents and SKAL-TEX Corporation. He is widely published in technical literature and was the Chairman of the National SPE Committee on Monographs. His technical expertise includes the design and supervision of production and well completion operations, formation damage and sand control, reservoir management, technology transfer and contract negotiations. He actively participated in several technology transfer agreements with various Indian, Chinese, and Russian companies. He is fluent in English, Russian and several Indian languages. Recently he was nominated as a member of the Russian Academy of Natural Sciences US Section. He received an M.S. and Ph.D. in petroleum engineering from the Gubkin Oil Institute, Moscow, Russia and a degree in law from Gujarat University, India. P&C MDT

DR. MOHAN 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 oil companies, the US Department of Energy, and Oklahoma Center for Advancement of Science and Technology. He has taught various short courses for many oil companies in Canada, Indonesia, Singapore, Nigeria, Kuwait, Abu Dhabi, Scotland, India, Denmark and across the United States. 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. P&C RES

MR. BILL KEMP has 40 years of oil and gas industry experience in engineering, operations, product development and commercialization, business development, sales, and 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-in-training. He had numerous field engineering, sales, product marketing and business development positions at Halliburton. As global marketing manager for stimulation in the late 1990s, he led the introduction of various innovative acidizing and fracturing technologies. He left Halliburton in 2000 to start a consulting company specializing in oilfield market research and new technology commercialization. Bill has been active in SPE and served numerous roles at both the local and national level. Bill has a BSEE from the University of Texas at Austin. MDT

MR. AARON L. KLEIN is based in Houston, Texas, and is the Vice President of Operations at PetrEX International, Inc. His training credentials with PetrEX include Leadership and Performance Skills Workshops, RigSMARTS Rig Crew Competency Training, Well Planning and Design, Train Wreck Avoidance, and more. Before joining PetrEX International, Inc. in 2005, he worked as a Drilling Foreman and Drilling Engineer for several major operators. Mr. Klein holds a Bachelor of Science in Chemical Engineering from South Dakota School of Mines and Technology. W/D

MR. STANLEY KLEINSTEIBER is a Senior Petroleum Engineer with MHA Petroleum Consultants Inc., a Denver-based petroleum consulting firm. Mr. Kleinsteiber has over 24 years of petroleum engineering experience and has authored or co-authored papers dealing with production decline type curve analysis, CO_2 flooding, and depletion of a rich gas condensate reservoir by nitrogen injection. Since joining MHA he has performed reservoir engineering studies in numerous US basins, Canada and Australia, as well as co-developed an in-house gas reservoir engineering course for several clients. Mr. Kleinsteiber has experience related to exploration well testing in the Mediterranean Ocean offshore Israel. He has also performed field development studies for coalbed methane reservoirs in the Bowen Basin of eastern Australia, and well test analyses for exploration wells in Hungary. Prior to joining MHA, he held various reservoir engineering positions with Amoco Production Company both in their Tulsa, Oklahoma research center and Denver regional production office. Mr. Kleinsteiber's last position with Amoco was Western Business Unit Technology Coordinator where he was an internal consultant to the business unit's engineering staff in the Rocky Mountain and Mid-Continent regions. Mr. Kleinsteiber and his colleagues at Amoco developed the initial plan of depletion for fields in Wyoming and Utah using compositional numerical simulation. His specific contributions were in the areas of fluid property characterization, well testing and simulation studies for various development options. Mr. Kleinsteiber also directs continued development of MHA's GAS3D reservoir simulator and software for production decline type curve analysis. He received a BS in petroleum engineering with highest honors from the University of Oklahoma in 1978. RES

DR. LARRY W. LAKE is a professor and Interim Chair in the Department of Petroleum and Geosystems Engineering at The University of Texas at Austin. He frequently conducts industrial and professional society short courses in enhanced oil recovery and reservoir characterization. He is the author or coauthor of more than 100 technical papers, four textbooks and the editor of three bound volumes. Previously, he worked for Shell Development Company in Houston, Texas and was chairman of the department from 1989 to 1997. Formerly, he held the Shell Distinguished Chair and the W.A. (Tex) Moncrief, Jr. Centennial Endowed Chair in Petroleum Engineering. Currently, he holds the W.A. (Monty) Moncrief Centennial Chair in Petroleum Engineering. He has served on the Board of Directors for the Society of Petroleum Engineers (SPE), as well as on several of its committees. He has received many awards/recognitions including: the 1996 Anthony F. Lucas Gold Medal of the AIME, the Degoyer Distinguished Service Award in 2002, the 1999-2000 Billy and Claude R. Hocott Distinguished Research Award and The University of Texas and the SPE/DOE Symposium IOR Pioneer Award in 2000. He received the SPE distinguished Service award in 2000, was named an SPE Honorary Member in 2006 and has twice been an SPE distinguished lecturer. In 2001, was chosen as a member of the Texas Society of Professional Engineers Dream Team. He is a member of the National Academy of Engineers, and received a BSE and PhD degrees in Chemical Engineering from Arizona State University and Rice University, respectively. RES

DR. JAMES F. LEA, JR. is an instructor of industry courses and is involved in industry production and artificial lift related projects. He has received the SPE award for 'Legends of Artificial Lift.' He spent 20 years with Amoco Corporation and was involved in consulting on flowing/lifting wells, testing, and research on lift methods, creating new computer programs for lifted and flowing wells, teaching production schools and monitoring JIPs on pipeline flow, artificial lift, erosion, corrosion, and others. He is on the API and 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" (Elesevier), 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. Slonneger 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. P&C

MR. JEFFREY (JEFF) LELEK has over 33 years' petroleum industry experience with Amoco, BP, and TNK-BP. Starting as a geologist in Denver, he has worked and/or managed exploration - appraisal - field development - production stage projects, as well as business development, strategy, commercial, and organizational capability areas. After working in most western US basins, Middle East New Venture access, and Amoco's corporate headquarters, he was Exploration Manager in Cairo responsible for building the Nile Delta effort, Gas Asset Manager in Canada, Developments Manager in Australia focused on LNG exports, and Exploration Manager in the North Sea. The latter part of his big company career involved discipline management, including people strategy, competency definition and development, global resource allocation, and hiring. His last position was Technical Capability Director for TNK-BP in Moscow. Jeff has a BA in geology from Dartmouth College, an MS in geology from the University of Montana, and an MBA. G

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, USA. During his early career he worked extensively as a Geologist in the Texas Gulf Coast and West Texas regions in the United States. He later expanded into

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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 start the 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 Department in Tripoli, Libya which had considerable success having both an external focus in 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 enmeshed with BP's E&P early development program called the Challenge Program. After retiring from BP in late 2009, 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. G MDT

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 petroleum engineering training. Prior to retirement he was Learning Leader for Geoscience and Petroleum Engineering at Shell's Houston learning center. Previous jobs included global Petrophysical Learning Director at Rijskijk, NL and Principal Petrophysical Engineer for a deepwater development project. He also served in various technical management positions during his career prior to retiring from Shell in 2010. Bob is skilled at delivering technical training across cultural and geographic groups. He has a BS/ME from Mississippi State, an MBA from the University of New Orleans and is a Registered Professional Engineer. PP MDT

MR. JOHN LOGEL is a Geophysical Consultant to various organizations as a mentor/teacher and prospect reviewer. John's previous positions were as Chief Geoscientist North Sea for Talisman Energy Norge/UK in Aberdeen Scotland, the Lead Geophysicist in Norway, and Senior Geoscience Advisor for North American Operations in Calgary AB. Prior to Talisman, John held several technical management and advising positions with Anadarko Canada, and Petro-Canada in Calgary and before that he worked 19 years for Mobil in numerous assignments in Europe and North America. John has over 34 years of experience in the industry, and has worked on the discovery, delineation and development of several giant, world-class oil and gas fields throughout the world. His interests are in reservoir prediction and characterization from seismic data, understanding and quantifying risk. His latest emphasis has been in the adaptation of geophysical techniques to better understand, predict and exploit unconventional reservoirs effectively. He teaches enthusiastically and loves to develop technology and encourage professional growth. John is a professional Geophysicist and holds a BS and MS from the University of Iowa. He is a member of SEG, CSEG, APEGA, and AAPG. John has held several positions with the CSEG and the SEG serving on technical committees; is on the curriculum committee for the DoodleTrain (CSEG); held several session chair positions at conventions; and held positions on the international showcase. John has authored or co-authored over 50 professional papers. GP

MR. DIEGO LONDONO is a Petroleum Engineer with 19+ years of experience in rigless well interventions acquired while working with major Services and E&P companiesin different locations around the world. His comprehensive professional 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 Stimulation and Coiled Tubing Field Engineer, then for BP as Well Interventions Engineer/Company Man in rigless well interventions. He worked for ENI in the giant Kashagan offshore project in the Caspian Sea as Coiled Tubing/Well Intervention Engineer, then 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. P&C

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 dedicated his career to providing high quality 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. O&M PPD

MR. PETE LUAN has over 25 years of international upstream project management experience. He has also consulted for the past 10 years helping energy companies improve 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. PM

MR. CHRISTIAAN 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. Christiaan 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. PB

MR. KEN LUNSFORD 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 and training for asset development, value improving 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. PM

DR. HELOISE 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. GP

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 returned to his true passions - 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. GP

MR. JOHN MARTINEZ has 50 years' experience in

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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, downhole equipment evaluation and selection. Surface facility design experience includes multiphase pipelines, separation, metering, compression, dehydration, water treatment and disposal, and pumps. He is a specialist in revising and upgrading lift and surface facilities to reduce failures and operating cost. He is a registered Professional Engineer in Texas. He received an MS and BS in Mechanical Engineering from the University of Texas. P&C

MS. RANDI MARTINSEN is a certified petroleum geologist with 40 years of experience (domestic and international) working in industry, consulting and teaching. She holds a B.S. in Earth and Space Science from Stony Brook University, NY and an MS in Geology from Northern Arizona University, Flagstaff. She started her career with Cities Service Company, Denver, CO., and subsequently, became a consultant. She has also been a Lecturer in Geology and Geophysics at the University of Wyoming (UW) for 35 years and has taught courses in petroleum geology and engineering, clastic depositional systems, sequence stratigraphy, reservoir characterization, field geology and physical geology. Her research focuses on developing and improving geologic models useful for exploration and production from stratigraphic traps and she has numerous publications in this area. Currently, she is transitioning to retiring from UW so as to be able to commit more time to her newly formed company, Hydrocarbon InSight, LLC. She is also currently the President of the American Association of Petroleum Geologists (AAPG). G

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, gold, conventional oil and gas and unconventional resources, both oil sands and source shale plays. He has worked for Marathon Oil, Western Oil Sands, 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 sand resources. He has a BS and MS from West Texas State University and a PhD from the University of Texas at El Paso. MDT

DR. MARK A. MCCAFFREY received his BA (1985) from Harvard University, magna cum laude with highest honors in geological sciences, and his PhD (1990) in chemical 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 geochemist, 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 #264), 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 fingerprinting, 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 relation to paleoenvironmental studies and petroleum exploration." In 1998, with project team members, Mark received the Arco Award of Excellence "for developing a new charge 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 Bernold M. "Bruno" Hanson DEG Excellence of Presentation award. G

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 depositional systems, exploration and development. 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, Stratimagic, GeoProbe, VoxelGeo, TerraSpark, GeoTeric, Petrel, and Shell seismic interpretation, 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 experienced in 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 part of a best of AAPG session. He has been an instructor for new hire training and co-taught a deepwater interpretation workshop for Nautilus. He was named mentor of the year from ConocoPhillips 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. G

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 shutoff, drag reduction techniques for 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 received a BS degree in Chemistry and Mathematics from Central Oklahoma University, and a PhD in Physical Chemistry from Arizona State University. P&C MDT

DR. 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 play analysis, 2D and 3D interpretation and prospecting, integrated geologic mapping and volumetric/risk analysis. Strengths include adaptability, passion for continued learning and a strong work ethic. Timothy received his PhD in Geological Sciences from University of Texas at Austin, his MS in Geology from New Mexico State University, and his BA in Geology from Rutgers University. G

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 Enhancement. He also spent nearly seven years as the Technical Manager in the Permian Basin area for Baker Hughes US Land Pressure Pumping in Midland, TX. In addition to facilitating a variety of top tier, engaging learning events for PetroSkills, Steve owns an independent consulting company, Dead Branch Consulting LLC. Mr. Metcalf has a Bachelor's Degree in Chemistry, with a double minor in Mathematics and Physics from Emporia State University. He also has a Master's of Science Degree in Physical Chemistry from Kansas State University. Steve is a Registered Professional Petroleum Engineer in Oklahoma since 1988, a member of the Society of Petroleum Engineers since 1977, and has co-authored over 60 papers in the areas of cementing, acidizing, and fracturing. In addition, Mr. Metcalf is an inventor and co-inventor on six US patents. P&C W/D

DR. KISHORE MOHANTY is the H.B. Harkins Professor of Petroleum & Geosystems Engineering at the University of Texas at Austin. His work experience includes 18 years of teaching at the University of Houston and 10 years of industrial research at the Exploration and Production Research Division, Atlantic Richfield Co. in Plano, Texas. He has many publications covering such topics as Transport in Porous Materials; Surfactant, Colloid and Interface Science; and Oil Recovery Enhancement Techniques. He received a Ph.D. in Chemical Engineering from the University of Minnesota and a Bachelors of Technology in Chemical Engineering from the Indian Institute of Technology. RES

MR. HECTOR C. MORENO was a Senior Instructor with Halliburton Baroid Fluid Services. As a Chemical Engineer he has been involved in the manufacturing, distribution and product application of drilling fluids. After being a supervisor of Schlumberger Mud Logging operations in Southern Argentina, he worked as a Core Analyst and built with Core Laboratories International -and using CoreLAB equipment- the first complete Core Analysis facility in Latin America to serve most of the area from the city of Bogot, Colombia. He developed better analytical techniques for precious and semiprecious metals from mining samples with the University of Buenos Aires in a joint project with the Latin American branch of Falconbridge. He worked as a fluids engineer in SE Asia, Europe, and Latin America before becoming engaged in the trade of nonmetallic minerals and supplier of imported commodities such as barite and bentonite for distinguished

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operators and fluids companies in Texas and Louisiana. He received his BS degree in chemical engineering at the University of Buenos Aires, Argentina. W/D

MR. JAMES D. MORSE is an applied structural geologist and President of Computational Geology, Inc. (CG). After studying structural geology and rock mechanics at Texas A&M University, Morse worked for Amoco, gaining valuable experience mapping the complex structures of the Idaho-Wyoming-Utah Thrust Belt. Seismic quality in thrust belts is often fair or poor, 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 apply 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 fair or poor. CG's clients have used GEODES worldwide to markedly 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. G

MR. LARRY R. MOYER has over 30 years' experience in all facets of the exploration, land and production phases of the oil and gas industry. He has extensive experience developing integrated geological, geophysical and engineering interpretations for use in exploration, field development and producing property evaluation, including geological and geophysical field and well-site supervision. He also has experience with coal, oil shale and hydrology projects. He has experience with all aspects of managing operated and non-operated oil and gas properties with emphasis in accounting, Joint Operating Agreements, oil and gas sales contracts/marketing, AFE's, revenue audits, gas balancing audits, permitting, and filing of regulatory reports. He has successfully sold prospects to both industry and non-industry partners to fund drilling wells and producing property acquisitions. He received a BA in accounting from Western State College, and a MS in Geology from University of Colorado. G

MR. DAVID PATRICK MURPHY retired from Shell Exploration and Production after almost 35 years of engineering and operational experience, with emphasis on petrophysical engineering and technical learning. For over 16 years he was formation evaluation lecturer in the University of Houston Petroleum Engineering Graduate Program. He received the Outstanding Lecturer award from the University of Houston Cullen College of Engineering twice. He is widely published including multiple articles in World Oil and contributions to Carbonate Reservoir Characterization: A Geological-Engineering Analysis, Part II (Elsevier 1996). He has been a judge for Hart's E&P annual Meritorious Engineering Awards and an industry advisor for Oilfield Review. He is a member of the Society of Petrophysicists and Well Log Analysts (SPWLA) and the Society of Petroleum Engineers (SPE). He has taught numerous SPWLA short courses. SPE committee memberships have included Education and Professionalism Committee and Measurement While Drilling Reprint Editorial Committee. Murphy is a Licensed Professional Engineer in Petroleum Engineering. He received a BS degree in Petroleum Engineering from the University of Oklahoma. PP RES

MR. MANICKAVASAKAN (MANICKAM) S. NADAR is a consultant Principal Petroleum engineer with 27 years of experience in the upstream oil and gas industry and 6 years in petrochemical process operations. With a strong background in Production Technology, Well Operations, Well Completions & Workovers, Artificial Lift, Asset Modeling and Optimization, he has specialized in artificial lift technologies, well and system designs, analysis, trouble-shooting, reliability improvement and production enhancement. He has made significant contribution in the artificial lift selection, design, operation, surveillance and optimization of large volume gas lifted and ESP wells for many operators. Mr. Nadar has worked for major international operating companies and handled various responsibilities in production engineering operations and artificial lift systems, onshore and offshore. In the service sector, he has delivered many challenging well and network modeling and optimization projects that helped clients achieve substantial increase in production, operation efficiency and cost savings. Recently he has helped companies to implement real-time surveillance and optimization systems that allows operators use collaborative work environments for achieving their KPIs. A university topper and gold medalist, Mr. Nadar holds a BSc degree in Chemistry from Madurai University, India and a degree in Chemical Engineering from Institution of Engineers (India). With several SPE papers and text book publications to his credit, he has conducted many workshops, training seminars and short courses for SPE and other organizations. P&C

DR. 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, all from the University of Alberta. He is currently employed at the Alberta Government, Department of Energy in Edmonton. P&C

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 Geomatrix Consultants, an Oakland based geological and environmental consulting firm. Prior to that, he was Director of Operations for Lumina 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. PB

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 including the 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 ASTD recognized him as the "Professional of the Year" in 1989 and his alma mater; Texas A&M University at Commerce, selected him as a "Distinguished Alumni" in 1990. PPD

DR. PHIL NOTZ is an offshore industry consultant for flow assurance issues. He worked as a chemical engineer for DuPont from 1968 to 1971, a research scientist and reservoir engineer for Getty Oil Company/Texaco/Chevron from 1978 to 2002. He worked for offshore engineering and construction firms, Doris Inc. (2002-2004) and Technip USA (2004-2008) as flow assurance manager. While at Getty/Texaco, Dr. Notz taught courses in surfactant polymer flooding, reservoir engineering, carbon dioxide flooding, reservoir fluid properties and flow assurance to operations in the US, UK, Ecuador and Saudi Arabia. He was Texaco's representative on the GPA research committee, the Colorado School of Mines Gas Hydrates Consortium and the DeepStar Flow Assurance Committee. Dr. Notz has a BS from the University of Wisconsin in Chemistry (Chemical Engineering minor) and a PhD from Michigan State University in Analytical Chemistry. P&C

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 written numerous technical papers relating to well completion and workover 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. P&C

DR. CARLOS PALACIOS 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, oil treatment, and corrosion monitoring in fields in Colombia, Bolivia, Peru, Ecuador, Mexico, Argentina, Venezuela, Kuwait, and the US. Dr. Palacios has been an instructor for about 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 # 7,942,200 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. P&C

DR. DAVID PELTON has been a professional communicator for over 35 years and has performed for and spoken to audiences in the United States, Central and Western Europe, Armenia, Azerbaijan, Russia, The Ukraine, Africa, The Middle East, and Southeast Asia. He has taught at major

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colleges and universities and has been an active seminar/workshop facilitator for petroleum and non-petroleum businesses in California, Colorado, Illinois, Louisiana, Massachusetts, New York, Rhode Island, Texas, Virginia and in Canada, England, Holland, Ireland, Wales, the Czech and Slovak Republics, Benin, Nigeria, The United Arab Emirates, Malaysia, and Singapore. Today he is a member of numerous training institutes and societies and enjoys a national and international reputation as a communications consultant, lecturer, trainer, and coach. He received degrees from Cornell University, The New England Conservatory of Music and the University of Cincinnati. PPD

MR. ANDREW PEPPER is Director of This is Petroleum Systems LLC - "t!Ps" - a consulting service that conducts studies, research into new workflows and tools, and training in the field of Petroleum Systems Analysis. The scope is both conventional and unconventional and global - but with current focus on the Gulf of Mexico and Permian Basins. He has held functional roles including responsibility for internal training at BP, Hess and BHP Billiton since 2000. Prior to forming t!Ps, 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 exploration dominance of the sub-salt of the deep water Gulf of Mexico. His early career as an international exploration geologist was punctuated by a rotation into the Sunbury Research Center from 1985-1989, where Andy performed technical studies and conducted research in the (then developing) fields of organic geochemistry and basin modeling. He has presented many oral papers beginning 1989, and is best known for publication of a trilogy of papers concerning petroleum generation and expulsion in 1995. These algorithms are now coded into modern basin modeling packages. In 1981 Andy received a BSc 1st Class Honors in Geologic Sciences at Leeds University, UK, where he is currently a Visiting Academic. G

MR. MARCO PEREZ has almost two decades of geophysical experience, in both north American and international basins, developing and employing AVO and inversion techniques to high grade exploration and development drilling locations. He has over 10 years' experience in technology groups at both Encana and Apache, applying rock physics-based interpretations to AVO and inversion projects. Mr. Perez is currently a manager of technical specialists, focusing technical direction of a multi-disciplined geotechnical team. He is tasked with generating workflows that integrate disparate data sets including petrophysical, microseismic, aeromagnetic, core, geological mapping, 3D seismic data, drilling, and completions data towards understanding production data in unconventional reservoirs. He has published and presented numerous papers at international conferences showcasing novel techniques to maximize seismic data. He won best RECORDER paper in 2010 and co-authored best CSEG 2018 oral presentation. He is an expert in implementing leading edge geophysical techniques in exploring and developing conventional and unconventional plays while providing technological leadership. This includes finding practical solutions to exploration and development problems that impact project economics. Mr. Perez has a BS in Physics from McGill University and an MS in Geophysics from the University of Calgary. GP

MR. ROBERTO PEVERARO is a petroleum geoscience and engineering consultant with over 38 years' experience in the oil industry, including senior technical management positions in formation evaluation, rock physics and borehole geophysics. Before founding Petrocomp Consulting, Ltd., he worked at Schlumberger and BNOC BRITOIL BP, where he held various senior level executive positions. In addition to having extensive technical authorship and publications, he is a senior member in IEEE, SEG, SPE, and SPWLA, a Recipient of SPWLA 2002 Distinguished Technical Achievement Award for Significant Technical Contributions in Formation Evaluation, and a Founder member of European Association of Petroleum Geoscientists and Engineers. He received both graduate and postgraduate degrees in Engineering Physics, and Applied Physics and Geophysics from Technical University Darmstadt, Germany. PP

DR. JOHN D. PIGOTT is an internationally recognized energy expert with more than 25 years' experience in worldwide hydrocarbon exploration-exploitation. He has been an Advisor to Foreign Energy Ministries, an Exploration Consultation for Oil Companies Worldwide, and a University Professor. He has worked in many different areas including concession design, corporate management evaluation and reorganization, regulator advisement and technical advisement. He integrated geological and geophysical data into predictive, comprehensive basin models for hydrocarbon exploration on 5 continents. He designed and implemented geologically targeted 2D-3D seismic acquisition, processing, and interpretation for field development in South East Asia, North Sea, Central America, and the Gulf Coast. He received a BS in Geology, a BA in Zoology (cum laude) and an MA in Geology from The University of Texas and a PhD in Geology from Northwestern University. G GP

MR. WILLIAM (BILL) E. POWELL is an oil and gas professional with over 30 years of experience in field operations, technical sales, marketing, and management with autonomous operations and profit and loss responsibility. Prior to entering the oil and gas industry with Schlumberger he served as a commissioned officer in the U.S. Marine Corps. Bill holds BS and MS degrees in Physics. He is a member of the Society of Petroleum Engineers, American Association of Petroleum Geologists, Society of Exploration Geophysicists, and European Association of Geoscientists and Engineers. Over the course of his career, Bill has taught short courses and seminars on a variety of technical topics. Bill served as Vice President Marketing for S.A. Holditch & Associates Inc., a well-known petroleum consultancy where he played a key role in building the brand equity that was the basis of their successful acquisition and integration into 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. MDT

DR. CLIFF REDUS is an independent petroleum engineering consultant who specializes in production system optimization and subsea flow assurance. Prior to starting his consulting business, he was an Associate Professor of Petroleum Engineering at the University of Tulsa. He has 35 years of 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 industrial research for the last 10 years 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. P&C

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 has been very diversified covering oil and gas reservoirs, onshore and offshore properties, primary, secondary and tertiary operations, and reservoir exploration and development projects. His responsibilities have been in reservoir engineering and reservoir simulation, but he has also done production engineering and exploratory well 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 written many internal publications. He has been an active member of SPE since 1975 and has held numerous positions within different SPE organizations. He received a B.S. degree in Engineering Science and a M.S. degree in Chemical Engineering from the University of Toronto. He also received a Ph.D. degree in Chemical Engineering from the California Institute of Technology. RES

MR. GERRY H. ROSS has more than 39 years' formation evaluation and rock based Petrophysics 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 engagement. He is course director for Basic Petroleum 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 engineering, reservoir description, and formation damage research. His international oil and gas knowledge was developed through extended assignments in South America, Asia, the North Sea and the US. He is a member of the SPE, SPWLA, PESGB, SEAPEX and a past president of the Aberdeen Chapter of the SPWLA. He received a BSc in Geology from Bedford College, London University. MDT

MS. DEBORAH RYAN is a Senior Reservoir Engineer. She has thirteen years of experience in oil and gas engineering, with experience in both conventional and unconventional. Deborah has an excellent working knowledge of Petrel/Eclipse, CMG, Aries, Petroleum Experts, IHS Harmony, PVTSim, and Microsoft Office Suite. Ms. Ryan has a Masters in Petroleum Engineering and a Bachelors in Chemical Engineering (with Honors), both from Curtin University of Technology in Perth, Australia. RES

DR. KENT SAUGIER is a hands-on scientific, technology and business professional with 25 years' experience in upstream oil and gas, offshore technology, economics, economic modeling, international petroleum contracts, project management, software applications and technology including design, licensing and commercialization. He has domestic and international experience, excellent presentation skills and strong customer awareness. He received both a B.A. and a Ph.D. in Chemistry from the University of California. PB MDT

MR. KENNETH J. SAVETH is a Senior Applications Engineer with 28 years of experience and expertise in PC pumping systems design, installation and support. He has performed root cause failure analysis on these pumping systems and provided reports and recommendations based on his findings. He has many years of experience training both internal and external personnel. Kenneth has a Bachelor of Science degree in Petroleum Engineering Technology from Oklahoma State University. P&C

MR. RICHARD H. SCHROEDER is founder and President of RHS Management, specializing in technical and management consulting for the petroleum industry. He has more than 45 years of experience in engineering, international operations, management and teaching experience in all phases

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of exploration, production, research and corporate development. He specializes in reservoir management, production optimization, drilling, operations, completion and workover capabilities, personnel development, communications and multi-discipline team building. His professional experience includes: 9 years in engineering, research and supervision with Exxon; 8 years as Sr Vice President with May Petroleum, an independent drilling fund company; 8 years as President of Rosewood Resources, a privately-owned international integrated oil company; and 7 years as President/Vice Chairman/Consultant of Harken Energy Corp., an international exploration company. He has authored articles and manuals on various phases of petroleum engineering and personnel management. He is a member of API, SPE, IPAA, and TIPRO, is a Tau Beta Pi Fellow, and has various outstanding lecturer awards. He received a BS in Engineering Science and an MS in Petroleum Engineering from the University of Texas at Austin. RES P&C MDT

MR. JOHN SCHUYLER, CAM, CCE, CMA, CMC, CPIM, PMP and PE, is a decision analyst, evaluation engineer, and investor. He founded his consulting practice, Decision Precision, in 1988. He has over 37 years of experience in analysis, consulting, training and management, primarily in the energy industry. His focus has been in feasibility analysis, appraisals, 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 practices. He is the revision author of Decision Analysis for Petroleum Exploration, 2nd Ed., author of Risk and Decision Analysis in Projects, 2nd Ed., and has written over 40 articles, papers and handbook chapters. He received BS and MS degrees in mineral-engineering physics from the Colorado School of Mines and an MBA from the University of Colorado. His website is www.maxvalue.com. PB

DR. JOHN SEIDLE is a Vice President and Senior Reservoir Engineer with MHA Petroleum Consultants, a Denver based petroleum consulting firm. He has more than 30 years' 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 shales and conventional gas and oil projects throughout the USA. He has taught an industry coalbed methane course for over a decade. He has co-authored 21 technical papers, a monograph chapter and holds 6 patents. He is a Registered Professional Engineer in Colorado, Oklahoma, and Wyoming and a member of SPE, SPEE, and CIM. He received a PhD in Mechanical Engineering from the University of Colorado. RES

DR. 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 17 years in academia. 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 the emerging technologies of horizontal wells and coiled tubing. 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 New Mexico, all in Chemical Engineering. He is a registered licensed professional engineer. W/D P&C

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 course instructor/lecturer on Reserves and Economics at Texas A&M University for two years. He is a member of the Society of Petroleum Engineers (SPE) and the Society of Petroleum Evaluation Engineers (SPEE). He has been a past member of the SPE Oil and Gas Reserves Committee and currently serves on the SPEE Reserves Definition Committee. Other society service includes as an SPE Distinguished Lecturer and on the SPEE Board of Directors. He has co-authored and presented several SPE technical papers on Reserve Estimation topics with two published in the SPE Economics and Management Journal. He received a BS in Chemical Engineering from the University of Akron. RES

DR. JOHN S. SNEIDER is President of Sneider Exploration, Inc., an exploration/exploitation consulting service that conducts studies around the world, but with a focus in Latin America, China, North Africa and the United States. He is also involved with industry training with more than 18 years' experience in Venezuela, Chile, Colombia, Peru, Argentina, Mexico, the North Sea, Switzerland, Korea, China, the Gulf Coast, Alaska, and the Permian Basin. From 1994 to the present, he has been a partner in PetroTech Associates, providing exploration/exploitation with analysis and evaluation of reservoir, seal and flow barrier rock types. From 1989 to 1990 he was a consultant for Green Hill Petroleum, Inc., in East Texas, and previously was a geologist with Shell Oil, Inc., in South Texas. While working on his PhD in Geology and Geophysics at Rice University, he spent 18 months in the Elf Acquitaine Paris office working various sequence stratigraphy projects focusing in the North Sea. He received a BS and an MS in Geology from Texas A&M and a PhD in Geology and Geophysics from Rice University. G PP

DR. HAMIDREZA (MEHRDAD) SOLTANZADEH is a Geomechanics Specialist at Canadian Discovery Ltd providing consulting services for geomechanical characterization, well planning, production improvement, and reservoir containment. Prior to joining CDL, he worked with Alberta Innovates-Technology Futures where he conducted several geomechanical characterization and thermo-poro-mechanical studies for caprock integrity assessment for different SAGD, CO_2-EOR, and CCS projects. Hamidreza has an extensive experience in characterization of geomechanical behavior of reservoirs and caprocks in response to pressure and temperature change as this was the main focus of his research during his PhD program and his subsequent work at the University of Saskatchewan, Canada. Prior to that, he practiced application of rock and soil mechanics in different areas of geotechnical engineering for about 7 years in various consulting and operational companies and research institutes. Hamidreza has taught several geomechanics-related and reservoir engineering courses at different universities including University of Saskatchewan. He is a registered professional engineer with APEGA and has co-authored several technical papers and reports. G RES

DR. CARL H. SONDERGELD is Professor and Curtis Mewbourne Chair, Mewbourne School of Petroleum and Geological Engineering at the University of Oklahoma. He has over 12 years in the field of education and over 19 years with Amoco as a Special Research Associate working in rock physics. He has developed course manuals, newsletters, web pages and two software packages: Rock Properties Database and Analysis System and Unified Rock Modeling Software. He has published over 75 papers on various subjects and he is principal or co-author on 14 patents. He received a Ph.D. in geophysics from Cornell University and both an M.A. and B.A. in geology from Queens College of the City of New York. PP

DR. JOHN P. SPIVEY has over 20 years' experience in the petroleum industry, with interests in pressure transient analysis, production data analysis, reservoir engineering, continuing education, and software development. From 1984 to 1990, he worked for SoftSearch, Inc. (later Dwights EnergyData) developing petroleum economics and engineering software. In 1990, he joined S.A. Holditch & Associates (SAH), which was purchased by Schlumberger (SLB) in 1997. While at SAH/SLB he conducted reservoir simulation, gas storage, and tight gas application studies and taught industry short courses in well testing and production data analysis. He actively participated in on-going development of SABRE, SAH numerical reservoir simulator, and in research in techniques for production data analysis for gas wells. He also designed and developed PROMAT, an analytical production data analysis and forecasting program, and WELLTEST, an interactive pressure transient test analysis program. In 2004, he started his own reservoir engineering consulting company, Phoenix Reservoir Engineering, and software development company, Phoenix Reservoir Software. Since 1992, he has served as Visiting Assistant Professor or Adjunct Assistant Professor at Texas A&M University, teaching undergraduate and graduate classes in gas reservoir engineering and pressure transient analysis, and serving on several graduate student committees. He is the editor of the SPE Reprint Series Vol. 52, Gas Reservoir Engineering, and Vol. 57, Pressure Transient Testing, and coauthor of SPE Textbook Series Vol. 9, Pressure Transient Testing and has published numerous papers and articles in industry journals and trade publications. He received a BS Physics from Abilene Christian University, an MS in Physics from the University of Washington, a PhD in Petroleum Engineering from Texas A&M University, and is a registered professional engineer in Texas. PP RES

DR. TOM J. TEMPLES is a consulting geologist and geophysicist with over 30 years of experience in geology, geophysics, health and safety relating to both the petroleum and environmental industries. He is an adjunct professor at Clemson University and was formerly a Research Associate Professor at the University of South Carolina. He has extensive experience in subsurface mapping, seismic stratigraphy, sequence stratigraphy, seismic interpretation, petroleum geology, and geophysics. He is a former Vice President and Exploration Manager of independent oil producers where he was responsible for exploration and generation of prospects for drilling as well as the risk assessment and budget preparation. Prior to this he was Senior Geotechnical Advisor to the Department of Energy and served in various capacities with Texaco. He received a B.S. from Clemson University, a MS from University of Georgia and a PhD from the University of South Carolina. G GP

MR. DAVID TENHOOR, CPIM, has been consulting and teaching APICS (The Association for Operations Management) CPIM certification courses since 2005. He has taught in many different industries from chemical processing to discrete manufacturing. Companies include BASF, National Oilwell Varco, Halliburton, ExxonMobil Chemical and Cameron. David brings a well-rounded package of industry experience to PetroSkills/JMC. He has held positions in Inventory Control, Manufacturing Management, Strategic Sourcing and Transportation/Distribution

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Management. He also has experience in Finance and Product Development. David received his undergraduate degree in Geology from Hope College in Holland, Michigan and an MBA in Supply Chain Management from Michigan State University. He is a member of the Houston Chapter of APICS and served two terms on the Board of Directors as Treasurer. SC

DR. JOHN (JACK) B. THOMAS has more than 45 years of diverse work experiences in which he has conducted or worked on hydrocarbon projects in most of the active petroleum-bearing basins of the world. He is recognized as an expert in reservoir characterization of conventional and unconventional reservoirs including those in tight gas, coalbed methane, all types of siliclastic and carbonate reservoirs. He has presented seminars in more than 26 nations on aspects of these topics. Currently he is PetroSkills Petrophysics Discipline Manager and course instructor. He has authored or co-authored two books on applied 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 leader 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. PP

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 goals through the execution of such. He has built and supervised a staff of experienced oil and gas professionals, evaluated drilling prospects, acquired producing properties, managed the operations of drilling and the production of oil and gas properties. He is experienced in all phases of petroleum engineering including economics, drilling, log analysis, completion, production and reservoir. He has a BS degree in Petroleum Engineering from the University of Oklahoma. P&C

MR. DAVID M. TUBBS has over 39 years of industry experience predominantly in oilfield operations. He has worked in most major basins of the United States, Central and Northern North Sea and the North Atlantic. He started his career in 1980 with Standard Oil of Ohio (Sohio) and continued with BP after the merger. From there David worked a variety of rolls with Louisiana Land and Exploration (LL&E), Burlington Resources and Leor Exploration before starting his consulting career with his own firm Liam Engineering LLC. David has extensive experience in all types of drilling, completion, and workover operations, particularly HPHT/sour service drilling and floating drilling. He oversaw the drilling of Burlington's Deep Bossier field development in East Texas and implemented a "slim-hole" drilling program utilizing expandable tubulars which saved over $1MM per well. Prior to this role he was the Burlington project manager for the construction of the Ensco 7500. He oversaw the procurement and factory acceptance testing of most of the primary equipment purchased for the rig. As an independent consultant he has enjoyed working a wide variety of areas including horizontal drilling and completions in addition to exploration/appraisal drilling in central Idaho. David graduated with high honors from New Mexico Institute of Mining and Technology in May 1980 with a BS in Petroleum Engineering. He is a member of SPE and a registered professional engineer in Texas. W/D

DR. KATINKA C. VAN CRANENBURGH is a founding partner of Community Wisdom Partners (CWP), a consultancy specializing in the creation of mutually beneficial relationships between business and societal actors. For over 16 years, she has contributed to Heineken's social performance policy and program, focusing on developing countries and complex environments. She created the Heineken Africa Foundation, a corporate philanthropic institution, and was responsible for the design and implementation of 45 health-care projects at a value of several million euros. In her last position as global employees' and human rights manager, she contributed to Heineken's global practice in non-technical (or societal) risk management. This included training commercial, human resources, public affairs and business managers, and executives in corporate social responsibility and proactive response to pressures and challenges from the external world. Katinka's academic background, including her PhD dissertation on how multinational companies and religious institutions manage business ethics, provides a solid theoretical foundation to all the practical work she does. At CWP she focuses on online and in-house training and consultancy coaching of business managers. Katinka is a columnist at The Post Online and is authoring a book with the working title "Between Manager and Human Being." She has a PhD in Management from the Rotterdam School of Management and an International MBA from the HES, University of Amsterdam. PB

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 execution, supervision and management with well testing, down hole tools, data acquisition, completions, cementing, fracturing, stimulations and workover 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 workover operations, costs and technical issues, with emphasis in testing. 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. P&C MDT

DR. WILLIAM J. WADE is President of Applied Tomographics Inc., a research and development operation specializing in down-sizing and up-powering CT scanners for future industrial applications. Formerly, he was President of LSS International, performing core analysis and CT-scanning in Trinidad, Nigeria, and Houston. His other professional experience includes positions at Champlin Petroleum Company and the Tennessee Division of Geology. He taught on carbonate depositional systems, sequence stratigraphy, carbonate petrography, physical geology, and marine geology at Louisiana State University, Montgomery College and Vanderbilt University. Currently, he is co-writing a book on carbonate reservoirs. In addition to publishing numerous technical papers, he was associate editor for the American Association of Petroleum Geologists Bulletin. He is a member of the American Association of Petroleum Geologists, Geological Society of America, Society for Sedimentary Research, Houston Geological Society, and International Association of Sedimentologists. He received a BA and MS in geology from Vanderbilt University, and a PhD in sedimentology from Louisiana State University. G

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 processes. He holds a BSc in Engineering Science (Mechanical) from Edinburgh University (1978) and is a Chartered Engineer with the Institute of Mechanical Engineers. HSE

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

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. W/D

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