NEW in 2018

• Advanced Project Management Workshop (pg 57)
• Advanced Practices in Exploration and Development of Unconventional Resources (pg 16)
• Competent Person Fall Protection (pg 46)
• Computer-Based Subsurface Mapping (pg 9)
• Managing Project Controls for Contractors and Owners (pg 56)
• NEW PetroAcademy Virtual/Blended Learning Options:
  - Basic Drilling, Completion, and Workover Operations (pg 6)
  - Basic Geophysics (pg 15)
  - Basic Reservoir Engineering (pg 29)
  - Completions and Workovers (pg 37)
  - Production Technology for Other Disciplines (pg 38)
A competent workforce has always been critical for our industry’s success, but it is even more important with challenging product prices. Doing more with less is how we can thrive in hard times, but that requires a very competent workforce.

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

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

NEW courses to look for in this edition include:

- Advanced Practices in Exploration and Development of Unconventional Resources (EDUR) - see page 16
- Advanced Project Management Workshop (APMW) - see page 57
- Competent Person Fall Protection (FPST) - see page 46
- Computer-Based Subsurface Mapping (CSM) - see page 9
- Managing Project Controls for Contractors and Owners (PC21) - see page 56

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

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

The following blended/virtual courses are available now and we will be adding more throughout 2018. For more information, see the back cover, or petroskills.com/blended.

- Applied Reservoir Engineering - page 29
- Basic Drilling, Completion, and Workover Operations - page 6
- Basic Geophysics - page 15
- Basic Petroleum Technology Principles - page 5
- Basic Reservoir Engineering - page 29
- Casing Design Workshop - page 20
- Completions and Workovers - page 37
- Foundations of Petrophysics - page 24
- NODAL Analysis Workshop - page 39
- Production Operations 1 - page 37
- Production Technology for Other Disciplines - page 38
- Scale Identification, Remediation, and Prevention Workshop - page 44
- Geophysics Progression Matrix
- 3D Seismic Attributes for Reservoir Characterization – SAR
- Advanced Practices in Exploration and Development of Unconventional Resources – EDUR
- Advanced Seismic Stratigraphy: A Sequence – Wavelet Analysis Exploration – Exploitation Workshop – ADS
- Applied Seismic Anisotropy for Fractured Reservoir Characterization – ASA
- AVO, Inversion, and Attributes: Principles and Applications – AVO
- Basic Geophysics – BGP (also available as a virtual/Blended course)
- Introduction to Seismic Stratigraphy: A Basin Scale Regional Exploration Workshop – ISS
- Seismic Acquisition Technology in a Regulatory Era – SATR
- Seismic Imaging of Subsurface Geology – SSD
- Seismic Interpretation – S1
- Seismic Velocities and Depth Conversion – SVDC
- Use of Full Azimuth Seismic and Microseismic for Unconventional Plays – FAMS

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.

Message from the CEO

Ford Brett
CEO, PetroSkills

Cover Image:
The Twelve Apostles, Port Campbell National Park, Australia. The Twelve Apostles is a series of limestone rock stacks rising to heights of 148 ft (45 m). The limestone dates back to 15 to 20 million years, with layers of varying density and durability.
TABLE OF CONTENTS

Petrophysics Progression Matrix

24

Applied Rock Mechanics – ARM

27

Capillarity in Rocks – CIR

26

Cased Hole Formation Evaluation – CH

27

Coring and Core Analysis – CCA

24

Foundations of Petrophysics – FPP (Also available as a Virtual/Blended course)

26

Integration of Rocks, Log and Test Data – ILC

27

Mudlogging – MDLG

25

Nuclear Magnetic Resonance (NMR) Petrophysics – NRMP

26

Petrophysics of Unconventional Reservoirs – PUR

27

Shaly Sand Petrophysics – APS

29

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

27

Well Log Interpretation – WLI (Virtual/Blended option coming soon)

27

Wireline Formation Testing and Interpretation – WFT

Reservoir Engineering Progression Matrix

28

Applied Reservoir Engineering – FE (Also available as a Virtual/Blended course)

29

Basic Reservoir Engineering – BR (Also available as a Virtual/Blended course)

29

Capillarity in Rocks – CIR

30

Chemical Enhanced Oil Recovery Fundamentals – EOCR

31

Decline Curve Analysis and Diagnostic Methods for Performance Forecasting – DCA

31

Enhanced Oil Recovery Fundamentals – ERF

31

Enhanced Oil Recovery with Gas Injection – EORGI

31

Gas Reservoir Management – GPM

32

History Matching and Reservoir Optimization – HMRO

32

Horizontal and Multilateral Wells: Analysis and Design – HML1

32

Integrated Reservoir Modeling – GRO

34

Naturally Fractured Reservoirs: Geologic and Engineering Analysis – FR

34

New Opportunities in Old Fields – NOF

35

Oil and Gas Reserves Evaluation – OGR

33

Reservoir Characterization: A Multi-Disciplinary Team Approach – RC

33

Reservoir Engineering for Other Disciplines – RDE

31

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

31

Reservoir Management – RM

33

Reservoir Management for Unconventional Reservoirs – RMUR

33

Reservoir Modeling of Heavy Oil Resources – HORM

33

Reservoir Simulation Strategies – RSS

33

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

33

Unconventional Resource and Reserve Evaluation – URERE

33

Waterflooding A to Z – WF

31

Well Test Design and Analysis – WTA

Production and Completions Engineering Progression Matrix

36

Acidizing Applications in Sandstones and Carbonates – ASC

40

Advanced Hydraulic Fracturing – AHF

40

Applied Water Technology in Oil and Gas Production – PW

41

Artificial Lift Systems – ALS

41

Beam Pumps – BP

38

Coiled Tubing Interventions – CTTI

37

Completions and Workovers – CWM (Also available as a Virtual/Blended course)

37

Downhole Remediation Practices for Mature Oil and Gas Wells – DRP

40

Electrical Submersible Pumps – ESP

41

Flow Assurance for Offshore Production – FAOP

43

Formation Damage: Causes, Prevention, and Remediation – FDP

44

Gas Lift – GLI

43

Gas Production Engineering – GPO

45

Gas Well Depletion/Reduction – GWD

45

Horizontal and Multilateral Wells: Completions and Stimulation – HML2

45

Hydraulic Fracturing Applications – HFA

46

NODAL Analysis Workshop (NAV) (Virtual/Blended course)

39

Performance Analysis, Prediction, and Optimization Using Nodal Analysis – P20

44

Plunger Lift – PLIS

44

Production Chemistry – GPC

44

Production Logging – RMP

Production and Completions Engineering (continued)

37

Production Operations 1 – PO1 (Also available as a Virtual/Blended course)

38

Production Technology for Other Disciplines – PTO (Also available as a Virtual/Blended course)

44

Sand Control – SDC

44

Scale Identification, Remediation and Prevention Workshop – SIR (Virtual/Blended course)

38

Surface Production Operations – PO3

45

Surface Water Management in Unconventional Resource Plays – SWM

39

Unconventional Reservoirs Completion and Stimulation – URCS

45

Water Management in Heavy Oil Resource Operations – HWOM

38

Well Stimulation: Practical and Applied – WS

Health, Safety, Environment

46

Health, Safety, Environment Progression Matrix

46

Applied Environmental Management – HSM

46

Competent Person Fall Protection – FPST

48

Fundamentals of Process Safety – PSF

48

Risk Based Process Safety Management – RPSM

Petroleum Business

52

Advanced Decision Analysis with Portfolio and Project Modeling – ADAO

51

Basic Petroleum Economics – BEC3

52

Cost Management – CM

53

Economics of Worldwide Petroleum Production – EWP

51

Expanded Basic Petroleum Economics – BEC

53

Fundamentals of International Oil and Gas Law – IOG

53

International Petroleum Contracts – IPC

51

Introduction to Petroleum Business – IPB

53

Petroleum Finance and Accounting Principles – PFA

50

Petroleum Risk and Decision Analysis – PRD

53

Strategic Thinking: A Tool-Based Approach – STT

Procurement / Supply Chain

54

Contracts and Tenders Fundamentals – CTF

55


55

Effective Materials Management – SC42

55

Institute of Clemson University

54

Inside Procurement in Oil and Gas – SC5

53

Strategic Procurement and Supply Management in the Oil and Gas Industry – SC6G

55

Supplier Relationship Management – SC6G

Project Management

57

Advanced Project Management – PMFM

57

Advanced Project Management II – PMFM2

57

Advanced Project Management Workshop – PPMW

57

Managing Brownfield Projects – PMBM

57

Petroleum Project Management: Principles and Practices – PPMP

57

Managing Brownfield Projects for Contractors and Owners – PC21

57

Project Management for Engineering and Construction – PMMC

57

Project Management in Upstream Field Development – PMFD

57

Risk Management for Upstream Capital Projects – PMRC

Petroleum Data Management

50

Argus Coordinate Reference Systems for Petroleum – GCRS

50

Argus Data Management for Petroleum – GDM

50

Argus Essentials for Petroleum – GE

49

Geomatics: Geokey and Cartography – GECM

49

Introduction to Data Management – IDM

50

Seismic Positioning Data Management – SPDPM

Petroleum Professional Development

57

Advanced Hydraulic Fracturing – AHF

56

Advanced Practices in Exploration and Development of Unconventional Resources – UDED

57

Applied Rock Mechanics – ARM

57

Basic Petroleum Engineering Practices – BPE

57

Basic Petroleum Technology – BPT

57

Completions and Workovers – CWM

57

Directional, Horizontal, and Multilateral Drilling – DHOD

57

Evaluating and Developing Shale Resources – SRE

57

Foundations of Petrophysics – FPP

57

Gas Production Engineering – GPO

57

Horizontal and Multilateral Wells: Analysis and Design – HML1

57

Horizontal and Multilateral Wells: Completions and Stimulation – HML2

57

Hydraulic Fracturing Applications – HFA

57

Petroleum Systems Analysis - PSA

57

Petrophysics of Unconventional Reservoirs – PUR

57

Project Management in Upstream Field Development – PMFM

57

Reservoir Management for Unconventional Reservoirs – RMUR

57

Surface Water Management in Unconventional Resource Plays – SWM

57

Unconventional Resource and Reserve Evaluation - URE

57

Unconventional Resources Completion and Stimulation – URC

17

Use of Full Asymmetric Seismic and Micro seismic for Unconventional Plays – FAMS

19

Well Design and Engineering – WDE

38

Well Test Design and Analysis – WTA

Instructor Biographies

60

Petroleum Skills Alliance

2

In-­House Training

3

Comprehensive Solutions

4

Petroleum Academy – Blended Learning Solutions

7

Future Skills

5

Sign Up for Emails

23

Unconventional Resources Progression

23

eLearning - ePilot and ePetrol

23

Petroleum Skills Conference Center

21

Sign Up for Emails

23

Testimonials - Our Participants Say It Best

21

Field Trips

48

Petroleum Academy – Blended Learning Solutions

51

Sign Up for Emails

49

Inside Back Cover Regional Contacts and Registration

51

Inside Back Cover CEU/PDI Certificates

21

Back Cover Petroleum Academy - Blended Learning Solutions

60

Instructor Biographies

60

Petroleum Skills Special Features

60

Petroleum Skills Alliance

2

In-­House Training

3

Comprehensive Solutions

4

Petroleum Academy – Blended Learning Solutions

7

Sign Up for Emails

23

Unconventional Resources Progression

23

eLearning - ePilot and ePetrol

23

Petroleum Skills Conference Center

21

Sign Up for Emails

23

Testimonials - Our Participants Say It Best

21

Field Trips

48

Petroleum Academy – Blended Learning Solutions

51

Sign Up for Emails

49

Inside Back Cover Regional Contacts and Registration

51

Inside Back Cover CEU/PDI Certificates

21

Back Cover Petroleum Academy - Blended Learning Solutions

60

Instructor Biographies

60
Mission: Build competent petroleum professionals by delivering learning and development when, where, and how customers need it.

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

For more information on membership, go to petroskills.com/membership
IN-HOUSE TRAINING
WHEN YOU NEED IT,
WHERE YOU NEED IT.

DO YOU HAVE TEAM TRAINING NEEDS? WE CAN HELP!

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

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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.

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How do you meet the challenges of competency development?

PetroSkills Solutions

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

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

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

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

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

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

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

Blended Learning Program Example:

- **Virtual Instructor-Led Training Session**
- **PetroCore® Reference Articles**
- **Moderated Discussion Forum**
- **E-Learning**

### PetroSkills® PetroAcademy

**Blended Learning Solutions**

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

For more information, visit petroskills.com/blended
Overview of the Petroleum Industry – OV

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

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 reservoires are discussed. Then, various facets of exploration technology, drilling engineering and operations, well completion technology, and production technology are covered before finishing with surface processing of produced fluids.

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

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

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

Basic Drilling, Completion and Workover Operations – BDC

BASIC 5-Day

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

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

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

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

Field Study – Heavy Oil Resources – HOF

BASIC 3-Day FIELD TRIP

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

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

YOU WILL LEARN
• How to understand the depositional and stratigraphic framework of the McMurray Formation
• How to understand the structural setting and relationships of timing, emplacement and preservation of Alberta’s bitumen/heavy oil resource
• The complex lithologic heterogeneities of the McMurray and their effect on mining and in-situ production
• To appreciate the challenges and progress of Environmental preservation efforts for the development and production of Alberta’s bitumen resource

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

BDC ALSO AVAILABLE AS A SELF-PACED, VIRTUAL COURSE

VIRTUAL DELIVERY S$3930

PETROSKILLS PetroAcademy
PETROSKILLS.COM/VIRTUAL-BDC

2018 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th></th>
<th>2018 Schedule and Tuition (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Denver, US 17-21 SEP $4140</td>
</tr>
<tr>
<td></td>
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<td>Kuala Lumpur, MY 29 OCT-2 NOV $4970</td>
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<td></td>
<td>London, UK 2-7 DEC $4790+VAT</td>
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<tr>
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<td>Oklahoma City, US 30 JUL-3 AUG $4090</td>
</tr>
<tr>
<td></td>
<td>DALLAS, US 6-12 OCT $4090</td>
</tr>
<tr>
<td></td>
<td>FT McMURRAY, CANADA 27-29 AUG $5940+GST</td>
</tr>
</tbody>
</table>

† includes field trip
Overview of Heavy Oil Resources – HOOV

BASIC 2-Day

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

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

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

COURSE CONTENT
Comparison of conventional and unconventional reservoirs • Worldwide heavy oil resources and occurrences • Bitumen and heavy oil definitions and introduction • Geology, history, and development of Canada’s 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)

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. This course takes an unbiased practical approach to the applications, citing benefits and limitations. The course provides an overview and details of specific occurrences of the geology, evaluation, development and commerciality of heavy oil/in-situ oil sands resources. Each attendee should come away with a great foundational knowledge of the business of evaluating and developing heavy oil resources.

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

YOU WILL LEARN HOW TO
• Evaluate and develop heavy oil/oil sands resources
• Understand the importance of heavy oil/oil sands resources in today’s world energy market
• Contrast heavy oil/oil sands resources as compared to conventional and other unconventional resources with aspects of finding, developing, and producing
• Understand the geology, critical attributes, and commerciality of the Canadian heavy oil/oil sands resources
• Collect the appropriate data and evaluate the critical geologic and reservoir parameters of various types of heavy oil/oil sands resources
• Recognize and evaluate the environmental challenges required to develop and produce heavy oil/oil sands resources
• Understand the process and methodology to evaluate, select, plan, design, and implement a heavy oil/oil sands resources 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 resources • 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’s heavy oil sands • Heavy oil/oil sands characteristics and development strategies • Oil sands mining details and reclamation • Environmental challenges for oil sands resources • Heavy oil and in-situ oil sands recovery process review • Introduction to Steam Assisted Gravity Drainage (SAGD) • Other commercial thermal in-situ methodologies • Commercial application of Cold Heavy Oil Production with Sand (CHOPS) in Canada and other non-thermal heavy oil recovery methods • Field examples and development strategies of heavy oil and in-situ oil sands recovery projects • Overview of thermal well completions and production facilities • Reserves and economics

Evaluating and Developing Shale Resources – SRE

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 play 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 and shale oil, tight gas, and coaled methane
• Recognize and describe shale play differences and critical reservoir properties to identify the sweet spots
• Estimate gas and oil in place
• Apply different resource evaluation techniques recognizing the advantages and disadvantages of each technique
• Apply drilling, completion, and stimulation technology to shale gas and shale oil formations
• Evaluate and forecast individual well and reservoir performance
• Determine how to estimate well reserves in both P&I (proven 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

2018 Schedule and Tuition (USD)

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

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

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

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

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

<table>
<thead>
<tr>
<th>Instructor Name</th>
<th>Geology Course</th>
<th>Petrophysics Course</th>
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<tr>
<td>Mr. Jeff Aldrich</td>
<td>Dr. Michael Graesser</td>
<td>Dr. Lawrence Teupel</td>
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<tr>
<td>Mr. Peter Barton</td>
<td>Dr. James Grahat</td>
<td>Dr. William Wade</td>
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<tr>
<td>Dr. Steven Boyer</td>
<td>Mr. Andrew Harper</td>
<td>Dr. Brian Williams</td>
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<tr>
<td>Mr. Satinder Chopra</td>
<td>Dr. Howard Johnson</td>
<td>Ms. Randi Martinson</td>
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<tr>
<td>Dr. Bruce Cronen</td>
<td>Mr. John Keasberry</td>
<td>Dr. Michael Grammer</td>
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<tr>
<td>Mr. John Dillon</td>
<td>Mr. Jeff Lele</td>
<td>Dr. Tim McMahon</td>
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<tr>
<td>Mr. John Moore</td>
<td>Mr. James Moore</td>
<td>Mr. Larry Moyer</td>
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<td>Mr. John Snyder</td>
<td>Mr. Chris Tan</td>
<td>Dr. John Gigott</td>
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<tr>
<td>Mr. Michael Moore</td>
<td>Mr. Daniel Vigg</td>
<td>Dr. Dennis Preslandowski</td>
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<tr>
<td>Mr. John Swiderski</td>
<td>Dr. Michael Tan</td>
<td>Dr. John WilliAMS</td>
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<tr>
<td>Ms. Mary Tanza</td>
<td>Mr. Larry Moyer</td>
<td>Dr. Tom Temple</td>
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**Foundation Geology** (Basic Petroleum Geology) (Page 19)

Petroleum Geology for Early Career Geoscientists and Engineers (as needed)

**Basic Petroleum Technology** (Page 5)

**Basic Petroleum Technology Principles** (Page 5) (Also available as a Virtual/Blended course)

**Basic Petroleum Engineering** (Page 29) (Also available as a Virtual/Blended course)

**Basic Drilling Technology** (Page 18)

**Basic Reservoir Engineering** (Page 30) (Also available as Virtual/Blended course)

**Advanced Reservoir Engineering** (Page 31) (Also available as a Virtual/Blended course)

**Conventional Reservoir Engineering** (Page 31) (Also available as a Virtual/Blended course)

**Field Geology** (Basic Petroleum Geology) (Page 37)

Petroleum Geology for Early Career Geoscientists and Engineers (as needed)

**Basic Petroleum Technology** (Page 5)

**Basic Petroleum Technology Principles** (Page 5) (Also available as a Virtual/Blended course)

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**Conventional Reservoir Engineering** (Page 31) (Also available as a Virtual/Blended course)

**Geophysics** (Page 17)

**Geological and Geophysical Characterization of Foreign Oil Reservoirs** (Page 10)

**Geophysical and Geophysical Characterization of Heavy Oil Reservoirs** (Page 10)

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**Geophysical and Geophysical Characterization of Foreign Oil Reservois** (Page 10)
Computer-Based Subsurface Mapping  
- CSM

**FOUNDATION 5-Day NEW**

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  
- Grid 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 stipple maps  
- Volumetrics

**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,S in carbonate reservoirs  
- Natural fractures in carbonates  
- Case histories and exercises from the Americas, Europe, and Asia  
- Exploration and exploitation strategies in carbonate and mixed terrains

**Sandstone Reservoirs  
- SR**

**FOUNDER 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  
- Shallow marine  
- 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 exploitation and production case histories  
- Exploration and production scaled case histories

**Mapping Subsurface Structures  
- MSS**

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

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

**YOU WILL LEARN HOW TO**
- Recognize common contouring pitfalls
- Find thickness in deviated wells
- Use thickness maps for input 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 (Aliani) diagrams for fault trap and seal analysis
- Map structures with multiple overlapping faults

**COURSE CONTENT**
Manual and computer contouring techniques  
- Using dip in mapping  
- Different measures of thickness  
- Thickness in deviated wells  
- Thickness maps  
- Dip-dominant cross sections  
- Data projection  
- Trend and plunge of folds on 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

**2018 Schedule and Tuition (USD)**

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See website for dates and locations

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

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Geochemistry: Tools for Effective Exploration and Development — MGT

FOUNDATIONS 5-Day

Undiscovered reserves in prolific, mature basins and bypassed petroleum in developed fields are key targets for increasing reserves at minimal cost. Geochemical tools can dramatically improve discovery and development success by identifying and characterizing these targets in both conventional and unconventional systems. Participants learn to interpret geochemical logs, map organic facies variations, identify petroleum systems using multivariate data, predict vertical and lateral variations in oil quality and gas-to-oil ratios, and how to integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression. The class gives special attention to three key applications of 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 and allocation of commingled production • Case studies • Determining the origin of hydrocarbon gases found in aquifers

Geomechanics for Heavy Oil – HOGM

FOUNDATIONS 3-Day

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

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)

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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 reservoirs 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 • Seismic-based exercises on each of these units

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See website for dates and locations

Petroleum Systems Analysis – PSA

FOUNDATIONS 5-Day

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

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

YOU WILL LEARN HOW TO
- Understand the Petroleum System controls and their relationships with petroleum generation and migration
- Understand and more realistically evaluate geohistory
- Understand the role of geophysical and geochemical data
- Understand the sources of geological data, its variability, and the effects of the data, its interpretation, on the projects and their economics
- Understand geological interpretation impact on reservoir management, and development/production
- Understand geological and geophysical data/interpretation

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Production Geology for Other Disciplines – PGD

FOUNDATIONS 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 geoscience tick, you will be able to phrase the appropriate questions, and then you will be able to deal with the answers. This course assumes the participant has some understanding of elementary geology, but it will provide a review of key geological principles and environments of deposition, all key to 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 interested in reservoir development and production positions.

YOU WILL LEARN HOW TO
- Understand the sources of geological data and the interpretation of that data, including maps, cross-sections, electric logs, and seismic sections
- Recognize the relationships between paleo-environmental interpretations and the practical application of these interpretations to field development
- Recognize and appreciate uncertainty in geological and geophysical data/interpretation
- Understand the uncertainty surrounding the geologist’s interpretation
- Recognize ways in which geological data is presented for evaluation in integrated asset teams
- Understand and more realistically evaluate geological 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 • Volumes • Well planning • Reservoir appraisal • Field development • Uncertainty analysis

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See website for dates and locations

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Any course is available inhouse at your location. Contact us today.
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 Mioocene delta complexes in Venezuela, Cretaceous incised valleys in the US, Paleozoic incised valleys and the rate elastic basin floor fans and lowstand prograding complexes in the US, and Jurassic basin floor and slope fans in France.

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

YOU WILL LEARN HOW TO
• Identify unconformities and sequence boundaries
• Identify 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

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 outcrop physical models, 2D and 3D seismic, and mature-field log-based interpretations from around the world provide analog examples for practical interpretation. Participants will fill in 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 styles and families • Mechanical principles governing fold and fault geometry • Predicting structural style from stratigraphy • Folding vs. faulting • Palinspastic restoration of cross sections • Structural validation criteria • Sequential restoration and growth history • Regional arches and domes • Compaction and subsurface solution • Wrench faults: simple, convergent, and divergent • Conjugate and domino-style strike-slip regimes • Thin-skinned fold-thrust belts • Fault-related folds • Duplexes • Basement-involvedcontraction • 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 • Rho and counterformal pseudotensional faults • Parallel-tensional habit of structural assemblages • Tectonic synthesis and exploration project

Analysis of Structural Traps in Extensional Settings – ESS

INTERMEDIATE 5-Day
FIELD TRIP
Extensional structures provide some of the world’s largest known oil reservoirs and remain one of the major frontier plays of the immediate future, both onshore and, particularly, in deep water offshore. 3D seismic has revolutionized structural mapping. However, the most realistic geologic interpretation of these structures is only as good as our ability to recognize and exploit the fundamental characteristics of the forms that are possible. This course presents outcrop, subsurface, seismic sections, and model analogs that will provide the starting point for structural interpretation in a wide range of extensional environments. Interpretations are validated by restoration and comparison to balanced models. This course covers the latest thinking on the use of predictive kinematic models appropriate for rifted and other extensional and transtensional areas. The instructors of this course are happy to accept examples from your company for analysis in class as one of the demonstration exercises. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time.

DESIGNED FOR
Geoscientists who require a practical familiarity with the application of a variety of state-of-the-art conventional and unconventional tools of hydrocarbon evaluation to sedimentary basins.

YOU WILL LEARN HOW TO
• Systematically assess the evolution of a basin’s petroleum system criticals through space and time through a non-linear parallel approach integrating geology, geophysics, and geochemistry
• Decorate a basin through space and time and build predictive basin models useful in exploration
• Evaluate the geomechanical fundamentals controlling a basin’s burial history through tectonic subsidence analysis
• Determine the thermal history of a basin and its importance upon source maturity dynamics
• Relate organic source quantity and quality to sedimentary processes and environments
• Delineate migration pathways through space and time
• Characterize the elements of reservoir and seal quality
• Construct and analyze petroleum events chart
• Geoscale the model
• Rank and quantify petroleum system risk deterministically and stochastically using Monte Carlo methods
• Construct and analyze a decision tree
• Classify basins for optimizing their exploration and development

COURSE CONTENT
Introduction to the Petroleum System and Petroleum System Criticals • Geomechanical fundamentals of basin formation • Burial history curve • Tectonic subsidence analysis • Geothermics: steady state and rifting • Organic geochemistry: quantity, quality, and maturity • Migration pathways • Reservoir-traps-seal systems • Critical points • Basin classification • Quantifying uncertainty, minimizing risk, and making decisions • Synthesis

Basin Analysis Workshop: An Integrated Approach – BA

INTERMEDIATE 5-Day
Basin analysis demands an integrated approach from explorationists. It can be 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. This five-day course provides the theory, methods, and practice for participants to develop and optimize their own individual basin evaluation and modeling modus operandi. Incorporated as practical problems for workshop analysis and significant group discussion are case histories from throughout the world utilizing geologic, geophysical, and geochemical data. In addition, students construct and interpret their own new subsidence curve histories using BAP/SIM and the industry standard computer software for basin modeling. Each participant should bring a hand calculator to class.

DESIGNED FOR
Geoscientists who require a practical familiarity with the application of a variety of state-of-the-art conventional and unconventional tools of hydrocarbon evaluation to sedimentary basins.

YOU WILL LEARN HOW TO
• Predict structural geometry from sparse or inconsistent data using kinematic models
• Recognize typical extensional and transtensional petroleum-trapping geometries

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

2018 Schedule and Tuition (USD)

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‡ includes field trip

2018 Schedule and Tuition (USD)

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‡ includes field trip

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Deep-water Turbidite Depositional Systems and Reservoirs – DWT
INTERMEDIATE 5-Day

Compressional and Transpressional Structural Styles – CPST
INTERMEDIATE 5-Day

Development Geology – DG
INTERMEDIATE 5-Day

Geochemical Techniques for Solving Reservoir Management and Field Development Problems – GTS
INTERMEDIATE 5-Day

**Compressional and Transpressional Structural Styles – CPST**

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 analog models 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.

**Course Objectives**

- **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
- Flaxural-slip restoration
- Area-depth technique for section validation, depth to detachment, bend-length changes, and fault prediction
- Fault-bend folds • Fault-tip folds
- Fault-propagation folds
- Detachment folds
- Buckle folds and the break-fold model
- Duplexes
- Triangle zones
- Growth folds
- Fracturing in compressional structures
- Summary of oil and gas fields

**Deep-water Turbidite Depositional Systems and Reservoirs – DWT**

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of evaluation 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 techniques. 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. Special note: sessions in Nice and Kilkee will include field trips. The seven-day sessions will be combined field and classroom based sessions. There will be four days in the classroom with lecture material and oilfield exercises on exploration and production, and three days in the field examining spectacular deepwater settings of either the Amont Sandstone Formation in Nice, Ross Sandstone Formation in Kilkee, or the Point Lobos Submarine Canyon and Pigeon Point Formation in Monterey, California. For Nice session, a moderate degree of physical fitness is required. For Kilkee, the going is easier in the field.

**Course Objectives**

- 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 reservoir models • Definition of pay

**Development Geology – DG**

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.

**Course Objectives**

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 from 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

**Geochemical Techniques for Solving Reservoir Management and Field Development Problems – GTS**

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 geochimnistry 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.

**Course Objectives**

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, PaaKView, ReserView, OLIUnmixer, Excess Pressure calculations, etc.)

**Course Content**

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

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2018 Schedule and Tuition (USD)

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*plus computer charge*
Integrated Carbonate Reservoir Characterization — ICR

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

Operations Geology — OG

INTERMEDIATE 5-Day

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

Prospect and Play Assessment — PPA

INTERMEDIATE 5-Day

This fully revised and updated course is a fully modern approach to defining prospect and play volumetrics, uncertainties in defining these volumes and the risk that the accumulation fields. This course offers a comprehensive, probabilistic play and prospect assessment procedures that are consistent and repeatable allowing for direct comparisons play to play and prospects to prospect. In addition, values are offered 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, geochronists, 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 assessment: techniques, comparative data, and graphs to estimate input factors, such as trap volume, porosity, net/gross saturation, hydrocarbon fill fraction, formation volume factors, and recovery efficiencies • Probability methods • Risk analysis • Hydrocarbon charge assessment: procedures for estimating possible amounts of oil and gas generated, migrated, and trapped in prospects • Prospect assessment workshop: Play assessment techniques: estimating the possible numbers, sizes, and associated risks for potential fields, with useful data on field densities, field-size distributions, oil versus gas relationships, and independent risks • Play recognition and mapping: play classification and subdivision, and play maps that high-grade the most favorable areas with minimal geologic risks • Play assessment workshop: projects supplied either by the instructor or by participants, worked by teams and reported to the entire group • Aggregation of assessment results: summing, derisking, and preparation for economic analysis • Limitations, pitfalls, uses, and discovery concepts: the philosophy of judging and using assessment results and the importance of basic geological concepts

Naturally Fractured Reservoirs: Geologic and Engineering Analysis — FR

SPECIALIZED 5-Day

FIELD TRIP

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 exercises 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 fluids 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

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

The first two courses in this section, **Basic Geophysics – BGP** and **Seismic Interpretation – S11**, 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 | Ms. Nancy House | Dr. Walter Lynn | Dr. David Muerdter |
| Mr. Bob Brune | Mr. John Logel | Mr. Donald MacPherson | Dr. John Pigott |
| Mr. Satinder Chopra | Dr. Heloise Lynn | Dr. Ken Mahrer | Dr. Tom Temple |

### Geophysics Course Progression Matrix

**Geology**

- **Basic Geophysics** (Page 15) (Virtual/Blended option available)
- **Basic Drilling Technology** (Page 18)
- **Basic Petroleum Engineering** (Page 19)
- **Basic Petroleum Geology** (Page 8) (Virtual/Blended option coming soon)
- **Basic Petroleum Technology** (Page 5)
- **Basic Petroleum Technology Principles** (Page 5) (Virtual/Blended course)

**Geophysics**

- **Geological and Geophysical Characterization of Heavy Oil Reservoirs** (Page 8)
- **Basic Geophysics** (Page 15) (Virtual/Blended option available)
- **Basic Petroleum Geology** (Page 8) (Virtual/Blended option available)
- **Basic Petroleum Technology** (Page 5)
- **Basic Petroleum Technology Principles** (Page 5) (Virtual/Blended course)

**Petrophysics**

- **Reservoir, Production and Drilling**

**Acquisition and Processing**

- **Advanced Practices in Exploration and Development of Unconventional Resources – EDUR**

**General Seismic Interpretation**

- **Seismic Stratigraphy and Seismic Facies**
- **Sequence Stratigraphy and Seismic Facies**

**Seismic Stratigraphic Interpretation**

- **2D and 3D Interpretation Techniques**
- **Interpretation of Structural and Stratigraphic Features**

**Borehole and Nonseismic Geophysics**

- **Hydrocarbon Geochemistry**
- **Hydrocarbon Sedimentology**

**Mapping / GIS**

- **ArcGIS Essentials for Petroleum** (Page 50)
- **ArcGIS for Petroleum** (Page 50)
- **Well Log Interpretation** (Page 28)
- **Foundations of Petrophysics** (Virtual/Blended option available)
- **Geometric Geometry and Cartography** (Page 48)

**Interpretation**

- **Advanced Practices in Exploration and Development of Unconventional Resources** (Page 16)

**3D Seismic Attributes for Reservoir Characterization** (Page 17)

**Borehole Geophysics**

- **Seismic Positioning**
- **Seismic velocities and Depth Conversion**
- **Seismic Acquisition Technology** (Page 16)

**Prospect and Play Assessment** (Page 10)

- **AVO, Inversion, and Attributes: Principles and Applications** (Page 16)

**Reservoir Characterization** (Page 20)

- **Seismic Imaging of Shallow Geology** (Page 15)
- **Seismic Velocities and Depth Conversion** (Page 16)

**Intermediate**

- **Advanced Practices in Exploration and Development of Unconventional Resources** (Page 16)
- **Mapping Subsurface Structures** (Page 18)

**Basin Analysis Workshop** (Page 11)

- **AVO, Inversion, and Attributes: Principles and Applications** (Page 16)

**Seismics Positioning**

- **Use of Full Azimuth Seismic and Microseismic for Unconventional Plays – FAMS** (Page 17)
- **Advanced Seismic Stratigraphy** (Page 17)

**Geophysics**

- **Seismic Interpretation of Different Structural Styles**
- **Seismic Interpretation of Different Structural Styles**
- **Seismic Interpretation of Different Structural Styles**
- **Identify Different Structural Styles From Seismic Data**
- **Create a Basic Stratigraphic Framework Using Seismic Stratigraphy**

**Foundation**

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

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**Seismic Interpretation – S11**

**FOUNDER**

- 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

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**2018 Schedule and Tuition (USD)**

- **HOUSTON, US**
  - **27-31 August**
  - **$4240**
- **KUALA LUMPUR, MYS**
  - **1-5 October**
  - **$5070**
- **LONDON, UK**
  - **5-9 November**
  - **$4890+VAT**
## Basic Geophysics – BGP

### 5-Day

**Basic**

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

### 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 wavelength 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

### ALSO AVAILABLE AS A VIRTUAL COURSE

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## Seismic Acquisition Technology in a Regulatory Era – SATR

### 5-Day

**Foundation**

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

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

### Designed For

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

### You Will Learn How To

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

### Course Content

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

## Seismic Imaging of Subsurface Geology – SSD

### 5-Day

**Foundation**

Basic seismic imaging principles and techniques are introduced at the outset of the course. The basic principles are extended to include advanced techniques that are referenced throughout the rest of the course. This course focuses on 3D seismic data. By the end of the course, the participant will understand how seismic acquisition and data processing steps affect seismic amplitudes to assess their validity as input to various post-processing steps. The course uses 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-G 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 and pre-stack depth migration
- Migration velocity analysis techniques

## 2018 Schedule and Tuition (USD)

### Houston, US

- **30 Apr-4 May** $4140
- **30 Jul-3 Aug** $4140
- **26-30 Nov** $4140

### London, UK

- **22-26 Oct** $4790+VAT

See website for dates and locations
Seismic Velocities and Depth Conversion – SVDC

FOUNDERATION 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. 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, qualify 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 how to create 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
Velocity: definition and comparison of the many types of velocity including average, interval, RMS, stacking, migration, F-wave, and S-wave • Velocity Inputs: accuracy and regional extent of each, including check shots, VSPs, sonic logs, time/depth curves, 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, Zoepritz equations, AIA, and AVO – Match/Synching Seismic to Calibrate 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 stretching, migration, tomography • Introduction to Advanced Topics: anisotropy, pore-pressure prediction, geostatistics, and forward modeling

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 effectively to 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 anoma 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 (Minifract) and microseismic • Water disposal and aquifer contamination • Economic evaluation of unconventional reservoirs • Volumetric assessment considering free and adsorbed gas • Risk assessment, common risk segment (CRS) analysis

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

INTERMEDIATE 5-Day

The subject of direct hydrocarbon indicators and AVO has rapidly expanded to include AVO inversion, offset AVO inversion, and 4D AVO inversion. A significant part of the course deals with rock physics as it relates to the other topics in the course. Further insight into the seismic data is supplied by looking at seismic attributes. The technology has provided the interpreter with a very new and exciting package of tools that allow us to 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 hydrocarbon signatures as a pore filling material • Various approaches to seismic modeling and fluid replacement • Rock properties and pore filling material from seismic inversion • Spectral decomposition and seismic attributes as other ways of extracting reservoir information from the seismic image • Methods of combining attributes as they relate to prospectivity

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

INTERMEDIATE 5-Day

One of the most revolutionary, most effective, yet most under-utilized tools introduced into exploration this century is that of seismic stratigraphy. It is not a tool exclusive to geophysicists, nor is it a tool only for geologists. Seismic stratigraphic techniques are based upon an integration of firm, well-established geological and geophysical fundamentals. When properly applied, seismic stratigraphy provides a powerful foundation in basin and reservoir 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 source for its petroleum and 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 systems through sequence stratigraphy
- Calculate and calibrate depositional systems through sequence stratigraphy
- Use data from active producing unconventional basins. Several spreadsheets are provided to allow for quick look reviews
- Develop 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.

COURSE CONTENT
Introduction: philosophy and history • Geophysical fundamentals • Breaking out geophysical fundamentals • Introduction to fault interpretation • Chronostratigraphy construction and interpretation • Formation surfaces, topographic and structural scales, and cycle orders • Vail sequence theory and sequence hierarchy • Carbonate sequences • Intrabasinal sequences • Seismic facies • Paleoenvironmental analysis • Geohistory reconstruction • Optimizing exploration
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 explain 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

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 Scales Regional Workshop, or have comparable training and desire a challenging workshop, which will improve exploration and development skills.

YOU WILL LEARN HOW TO
• Evaluate rock-fluid information from wavelet analysis (frequency, velocity, Q, seismic attributes, and AVO)
• Understand the strengths and weaknesses of geovisualization using and misusing synthetics, seismic inversion, and VSP
• Determine fault mechanical stratigraphy through proper interpretation of fault imaging
• Understand the differences, weaknesses, and strengths of both the Vail with the Galloway sequence paradigms and when to optimally employ them
• Develop 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 paraconfluence sets
• Interpret clastic and carbonate depositional systems and their relationship to Walter’s law
• Classify deltas based upon their seismic characteristics
• Review of philosophy and epistemology

COURSE CONTENT
Review of reflection seismology • Application of geophysical fundamentals (wave theory, attributes, frequency substitution, and coherence) • Amplitude variation with offset (lithological, fluids, gases, porosity, pore 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

Applied Seismic Anisotropy for Fractured Reservoir Characterization – ASAP
SPECIALIZED 5-Day

This course is designed to enable you to perform professional geophysical work to evaluate fractured reservoirs and/or reservoirs that require hydraulic fracturing to produce. The emphasis of the lectures is centered on 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 will also involve integrating the support data - well logs, production testing, VSP, core work - with your reflection seismic data. The skills you will learn include 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 hydraulic fracturing to produce.

YOU WILL LEARN HOW TO
• Ask necessary geotechnical questions about your reservoir and play, identify the geophysical data needed to answer those questions; design acquisition and processing procedures; qualify-check during processing; interpret the final processed data; model different interpretations.
• Identify the support data required for successful fracture and 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 data set(s) - they could demonstrate the principals of the morning lectures.

Use of Full Azimuth Seismic Anisotropy and Microseismic for Unconventional Plays – FAMS
SPECIALIZED 5-Day

For surface seismic, participants will learn to evaluate azimuthal seismic in fractured reservoirs or reservoir intervals needing hydraulic 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 geosteering 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 - nonaximuthal 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 1: results – the dots
• Examples 2: interpretation and integration • Pitfalls, benefits, FAQs • Wrap-up discussion

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

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2018 Schedule and Tuition (USD)

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Well Construction / Drilling
Course Progression Matrix

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

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

<table>
<thead>
<tr>
<th>Mr. Peter Aird</th>
<th>Mr. Kevin Cutler</th>
<th>Mr. Steve McKeever</th>
<th>Dr. Don Schmidt</th>
<th>Mr. Larry Wolfsen</th>
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<td>Mr. Steve Metzger</td>
<td>Dr. Subrata Shah</td>
<td>Mr. Dee Wright</td>
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<td>Mr. Jerry Caupert</td>
<td>Mr. Kirk Harris</td>
<td>Mr. Hector Moreno</td>
<td>Mr. Marc Summers</td>
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<td>Formation Damage (Page 43)</td>
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<td>Applied Environmental Management (Page 47)</td>
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<td>Production Technology for Other Drills (Page 40)</td>
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<td>Completions and Workovers (Page 37)</td>
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<td>Petroleum Risk and Decision Analysis (Page 58)</td>
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<td>Drilling Fluids Technology (Page 19)</td>
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<td>Evaluating and Developing Shale Resources (Page 7)</td>
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<td>Offshore Drilling Operations (Page 20)</td>
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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 cementing 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 placement • Stage cementing, squeezes, and appropriate slurries • Mud removal and cement connections • Casing stress calculations • Casing loads • Selecting casing and hole sizes • Setting depths

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 show 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 design
• Understand different bit types and applications, and perform calculations to support bit run economics
• Optimize hydraulics for each hole interval based upon wellbore, fluids and drill string configurations
• Compile risks to well delivery, and develop mitigations and contingency plans
• Develop minimum rig capability specifications to deliver well requirements
• Present and defend a well plan to management

Drilling Fluids Technology – DFT

FOUNDATION 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 drive 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 fluids system
• Minimize formation damage to optimize well productivity
• Evaluate options for drilling fluid waste management

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

*Based on laboratory availability

Drilling Practices – DP

FOUNDATION 10-Day
The two-week course is designed for engineers and field personnel involved in the planning and implementation of drilling programs. The seminar covers all aspects of drilling technology, emphasizing both theory and practical application. Drilling is a complex operation requiring the marriage of different technologies and disciplines. Today’s drilling personnel must have a working knowledge of all these disciplines in order to effectively drive 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 sizes, BOP equipment • Cement, cement additives and displacement mechanics • Deviation control, directional drilling and horizontal drilling • Pressure control, routine and special problems • Project post analysis

2018 Schedule and Tuition (USD)

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2018 Schedule and Tuition (USD)

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2018 Schedule and Tuition (USD)

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

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

### FOUNDATION 5-Day

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

## 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

### BLENDED LEARNING WORKSHOP STRUCTURE

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<td>Select Casing Depth and Sizes</td>
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<tr>
<td>3</td>
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<td>Calculate Collaps and Burst Loads</td>
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<td>Calculate Collaps and Burst Loads</td>
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<tr>
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<td></td>
<td>Casing Load Determination</td>
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<td>3</td>
<td></td>
<td>Make Preliminary Casing Selection, Adjust for Axial Loads</td>
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<td>Make Preliminary Casing Selection, Adjust for Axial Loads</td>
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<td></td>
<td>Casing Selection for Collapse, Burst, and Axial Design</td>
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<td>Calculate Combined Load Effects, Adjust and Make Final Selection</td>
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<td>Calculate Combined Load Effects, Adjust and Make Final Selection</td>
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<td>Workshop Wrap-up</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Optional session - Creating Detailed Design for Portfolio Well</td>
</tr>
</tbody>
</table>

## 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 rig, 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; subsea infrastructure; 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 fluid selection, wellbore stability, NPT avoidance) • Transition to completion/intervention (barrier maintenance, job sequencing, intervention options)

## Offshore Drilling Operations – ODO

### TO LEARN MORE, VISIT

PETROSKILLS.COM/CASING-DESIGN-WORKSHOP
Primary Cementing – Cementing I – PCE

Cementing is a key factor in the well construction plan. The base cement used in the designing of cement slurry 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

Stuck Pipe Prevention – Train Wreck Avoidance™ – SPP

FOUNDATION 4-Day LAB VISIT

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 informational materials available, delegates hone their knowledge of basic drilling technology and how it relates to avoiding NPT.

DESIGNED FOR
Entire drilling and completions teams, 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 wells 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

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 • Laboratory testing • Casing hardware • Cement sheath integrity • Cement sheath evaluation • Mixing equipment • Special cement systems • Cement guidelines • Current documents

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, BHA’s, 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
• Complete 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 drilling 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

2018 Schedule and Tuition (USD)

<table>
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<th>Course</th>
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<td>31 JUL-3 AUG</td>
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<td>Intermediate 5-Day</td>
<td>HOUSTON, US</td>
<td>29 OCT-2 NOV</td>
<td>$4515</td>
</tr>
</tbody>
</table>

See website for dates and locations

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

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
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
- Diagrammatically drill with rotary BHAs, jetting, whipstocks, motor, steerable motors, and rotary steerable systems
- Drill horizontally underbalanced
- Interpret torque and drag and determine what factors will affect the torque and drag
- Determine cementing requirements for directional wells

COURSE CONTENT

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

Drill String Design and Optimization — DSD

INTERMEDIATE 5-Day

We have been presenting Drill String Design workshops for over 12 years for all types of operations around the world. We are constantly updating our material 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
- Classify 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, buffing loads
- Understand the basis for industry software design tools, including torque and drag, casing wear, and hydraulics
- Identify drilling tools and operational practices to reduce both torque and drag and casing wear
- Diagnose and mitigate vibration to reduce drill string damage and failure
- Optimize your drill string inspection program using the latest industry standards

COURSE CONTENT

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

Managing Wellsite Operations — MWC

INTERMEDIATE 5-Day

Managing Wellsite Operations is an interactive course that teaches participants to successfully manage wellsite operational plans, resource 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, operators, managers, senior drilling contractor, and wellsie 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

Practical Drilling Skills — PDS

INTERMEDIATE 5-Day

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

DESIGNED FOR

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

YOU WILL LEARN HOW TO

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

COURSE CONTENT

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

2018 Schedule and Tuition (USD)

HOUSTON, US 23-27 APR $4340
OKLAHOMA CITY, US 10-14 SEP $4290
HOUSTON, US 9-13 JUL $4490
KUALA LUMPUR, MYS 15-19 OCT $5320
HOUSTON, US 10-14 SEP $4340
HOUSTON, US 7-11 MAY $4340

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Any course is available inhouse at your location. Contact us today.
Drilling fluids containing too many drilled solids increase trouble costs or visible and invisible non-productive time (NPT). Invisible NPT relates to drilling performance, excessive volumes of drilling fluid, as well as cementing problems and barrier failure.

All drilling fluid surface treatment systems should have three identifiable sections: Suction, Addition, and Removal. The suction section must blend the fluid so that the mud weight in the drill pipe is the same from top to bottom for reliable well control. Tank volumes, agitation, mud guns, and additional procedures are discussed to ensure a homogeneous fluid.

Drilled solids are easier to remove when they are large. Solids control starts with cuttings removal at the drill bit to eliminate regrinding and reduced drilling rate. Removal of drilled solids requires an understanding of the performance of shale shakers, hydrocyclones, mud cleaners, and centrifuges.

Analysis procedures applicable for all drilling rigs, large and small, as well as any drilling fluid, will be discussed. Procedures will be presented to determine the optimum drilled solids removal efficiency for each target drilled solids concentration.

**SPECIALIZED**

5-Day Course Overview

Drilling fluids containing too many drilled solids increase trouble costs or visible and invisible non-productive time (NPT). Invisible NPT relates to drilling performance, excessive volumes of drilling fluid, as well as cementing problems and barrier failure.

Drilled solids are easier to remove when they are large. Solids control starts with cuttings removal at the drill bit to eliminate regrinding and reduced drilling rate. Removal of drilled solids requires an understanding of the performance of shale shakers, hydrocyclones, mud cleaners, and centrifuges.

Analysis procedures applicable for all drilling rigs, large and small, as well as any drilling fluid, will be discussed. Procedures will be presented to determine the optimum drilled solids removal efficiency for each target drilled solids concentration.

**DESIGNED FOR**

Only people interested in eliminating non-productive time while drilling: drilling engineers, drilling rig supervisors, tool pushers, drilling managers, operating company personnel and reservoir engineers.

**YOU WILL LEARN HOW TO**

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

**CONTENT**

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

**2018 Schedule and Tuition (USD)**

**HOUSTON, US 4-8 JUN**

$4440
The Course Progression Matrix below shows how the Petrophysics courses in this section are structured within each topic, from Basic to Specialized. On either side of the Petrophysics section, you will see courses in associated disciplines for cross-training. These matrices are ideal for building training plans for early-career staff or finding the right course to build upon existing knowledge and experience.

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

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

**Geology and Geophysics**

| Basic Petroleum Geology (Page 8) (also available as a virtual/blended course) |
| Basic Petroleum Technology (Page 9) |
| Basic Petroleum Technology Principles (Page 5) (virtual/blended course) |

**Petrophysics**

| Petrophysical Data Acquisition | Wireline Formation Testing and Interpretation (Page 27) |
| Applied Rock Mechanics (Page 27) |
| Core Hole Formation Evaluation (Page 27) |
| Naturally Fractured Reservoirs (Page 34) |

**Reservoir Engineering**

| Production and Grilling |
| Wireline Formation Testing and Interpretation (Page 27) |
| Applied Rock Mechanics (Page 27) |
| Core Hole Formation Evaluation (Page 27) |
| Naturally Fractured Reservoirs (Page 34) |

**Field Studies**

| Carbonate Reservoirs (Page 9) |
| Structural and Stratigraphic Interpretation of Dimpeters and Borehole-Imaging Logs (Page 25) |
| Operations Geology (Page 13) |
| Petrophysics of Unconventional Reservoirs (Page 25) |
| Production Logging (Page 44) |
| Reservoir Characterization (Page 33) |

**Specialized**

| Nuclear Magnetic Resonance (NMR) Petrophysics (Page 26) |
| Shaly Sand Petrophysics (Page 26) |
| Integration of Rocks, Logs and Test Data (Page 26) |
| Capillarity in Rocks (Page 26) |

**Intermediate**

| Well Log Interpretation (Page 25) |
| Core and Core Analyses (Page 25) |
| Foundations of Petrophysics (Page 24) (also available as a virtual/blended course) |
| Mudlogging (Page 25) |
| Evaluation and Developing Shale Resources (Page 7) |

**Foundation**

| Petrophysics Geology and Petrophysics (Page 13) (virtual/blended option coming soon) |
| Basic Geophysics (Page 12) |
| Basic Petroleum Geology (Page 8) (virtual/blended option coming soon) |
| Basic Petroleum Technology (Page 9) |
| Basic Petroleum Technology Principles (Page 5) (virtual/blended course) |

**2018 Schedule and Tuition (USD)**

- CALGARY, CANADA 27-31 AUG $4190+GSTR
- HOUSTON, US 19-23 MAR $4240
- KUALA LUMPUR, MYS 29 OCT-2 NOV $4340
- LONDON, UK 26-30 NOV $4890+VAT

Any course is available inhouse 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 reservoir engineers to marketing. 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-plottting and reconciliation techniques quickly and efficiently discriminate between water, oil, and gas. Error minimization techniques, applicable only to computerized log analysis, produce optimal results. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

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

YOU WILL LEARN HOW TO
• Identify reservoirs
• Determine mineralogy, porosity, and saturation in various lithologies
• Recognize the importance of electrical properties of earth materials
• Highlight oil mobility
• Interpret pressure profiles
• Develop 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, lateral • Resistivity/reservoir discrimination • Multisensitivity logs, GR, GSR, 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 mineralogical identification • Partially saturated rock properties and Archie Equation • Linear movable oil plot • Reconnaissance techniques, Rwa, FPR/IP, log-log scale • Porosity-resistivity crossplots • Permeability relationships • Nuclear magnetic resonance • Use of pressure measurements • Computerized log evaluation • Sidewall coring • Recommended logging programs

2018 Schedule and Tuition (USD)

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<th>Location</th>
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<th>Tuition</th>
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<td>Denver, US</td>
<td>16-20 SEP</td>
<td>$4340</td>
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<td>Dubai, UAE</td>
<td>6-10 MAY</td>
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<td>Houston, US</td>
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<td>12-16 NOV</td>
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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 utilization 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., wettability, relative permeability, capillary pressure, and reservoir fluid distribution for reservoir engineering and petrophysical evaluation)
• Prevent/spot errors in core analysis vendor reports (quality control)
• Select samples for special core studies
• Correlate core and log data

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

2018 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition</th>
</tr>
</thead>
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<tr>
<td>Houston, US</td>
<td>17-21 SEP</td>
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<tr>
<td>London, UK</td>
<td>30 JUL-3 AUG</td>
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Mudlogging – MDLG

FOUNDATION 5-Day

Mud logging, also known as surface logging, is the creation of a detailed record of a borehole by examining the bits of rock or sediment brought to the surface by the circulating drilling medium (usually common 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
• Design drilling mud theology and hydraulics
• Handle, process and describe cores
• Evaluate different types of pressure
• Handle formation pressure to minimize borehole risks

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

Petrophysics of Unconventional Reservoirs – PUR

INTERMEDIATE 3-Day
Petrophysics is central to the integration of a wide spectrum of related geoscience and engineering disciplines. However, students should also be familiar with at least two or more of the following topics: horizontal well drilling, wireline logging and log analysis, coring and core analysis, petrophysics, geophysics, geochemistry, formation testing, rock mechanics, hydraulic fracturing, and petroleum economics.

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

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

COURSE CONTENT
Overview of unconventional reservoirs • Geochemistry of unconventional rocks • Special coring and core analysis techniques for unconventionals • Wireline logging of unconventional reservoirs • Assessment of formation organic content (TOC) and maturity • Gas-in-place and reserve and flow potential estimates • Geomechanics and fracturing
Chapter 1: Capillarity in Rocks

You will learn how to:
- Select the appropriate capillary pressure measurement method for a set of desired results.
- Estimate permeability from a mercury- or air-capillary pressure curve.
- Calculate porosity using a capillary pressure curve.
- Create a synthetic capillary pressure curve and estimate the air permeability from a Petrography 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 multiphase pore system rock.
- Determine irreducible water saturation.
- Estimate the length of a transition zone.
- Determine clay-bound water using the Klein-Hill-Shirley method.
- Compare/contrast capillary pressure data with NMR data.
- Determine the maximum column of hydrocarbon that a specific sealing layer can sustain without leaking.

Course content:
- Capillary pressure applications in reservoir characterization: Rock properties from mercury/air-capillary pressure curves; 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.

Chapter 2: Integration of Rocks, Log and Test Data

You will learn how to:
- Identify clastic and carbonate rock types based on productivity differences.
- Determine key reservoir rock parameters needed for a more accurate reservoir evaluation.
- Use cuttings, sidewall cores, and cores to determine reservoir parameters.
- Design an integrated interpretation.
- Calculate Vc1.
- Calculate porosity using porosity logs in complex lithologies.
- Determine what percentage of porosity contributes to production.
- Calculate S_w 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 pore components: EC fluid sensitivity.
- Review of production profiles.
- Overpressure pressure transient analysis.
- Calculation of Vc1/Vi1 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.

Chapter 3: Nuclear Magnetic Resonance (NMR) Petrophysics

You will learn how to:
- Understand how NMR works for petrophysical applications.
- Understand the language of NMR technology (mrimonics).
- Use NMR data for core and log applications.
- Understand how NMR fits into predictive rock typing.
- 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).

Chapter 4: Shaly Sand Petrophysics

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 petrophysical, core, and log data to significantly improve reservoir evaluation in shaly sands.
- Integrate other rock cores 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 productivity of shaly sands using time-tested specific methods.
- Evaluate the strengths and weaknesses of advanced logging tools for characterization of shaly sands.

Course content:
- Review of log interpretation techniques in clean formations.
- Core analyses and applications of specific core tests.
- 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 petrophysical, core, and log data for evaluation of shaly sands.
- Effects of clay minerals and shale laminations on log responses in shaly sands.
- Various methods of shale content evaluation.
- Models for porosity and saturation determination: total and effective porosity.
- Archie, Waterman-Smits, Dual Water and Jaumouillé saturation methods.
- Prediction of permeability and productivity from logs in shaly sands: identification of bypassed pay.
- Use of advanced logs (NMR, BHI, Dipmeters) integration with core data for purposes of evaluation.
**Applied Rock Mechanics – ARM**

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

**Cased Hole Formation Evaluation – CH**

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**

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 wettability, 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, scourred 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

**SPECIALIZED 3-Day**

**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.

**SPECIALIZED 4-Day**

1-5 OCT $4615

DENVER, US

**2018 Schedule and Tuition (USD)**

<table>
<thead>
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<th>2018 Schedule and Tuition (USD)</th>
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<tr>
<td>1-5 OCT $4615</td>
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<td>14-18 MAY $4440</td>
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</table>

† includes field trip
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. Rosana Ancheta**
- **Dr. Anas Balboni**
- **Dr. Shalu Bagchi**
- **Dr. Archana Basu**
- **Dr. Reza Delshad**
- **Dr. Akhil Daghat-Gupta**
- **Mr. James Baldwin**
- **Dr. Ali Bakhsh**
- **Mr. Jerry Balfour**
- **Dr. Richard Henry**
- **Dr. Timothy Honer**
- **Dr. Chrish Hori**
- **Dr. Craig Justin**
- **Dr. Mohsin Kheir**
- **Mr. Stanley Kleiner**
- **Dr. Larry W. Lake**
- **Dr. Khoshro Mohanty**
- **Mr. David Patrick Murphy**
- **Dr. Grant Robertson**
- **Dr. Daniel Saffron**
- **Mr. Richard Schroeder**
- **Mr. John Siedle**
- **Mr. Rod Soule**
- **Dr. George Suter**
- **Dr. John Shvey**
- **Dr. Lawrence Telfer**
- **Dr. Dave Waldemar**

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**Reservoir Engineering**

### Course Progression Matrix

<table>
<thead>
<tr>
<th>Geology and Geophysics</th>
<th>Petrophysics</th>
<th>Reservoir Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modeling and Simulation</strong></td>
<td><strong>Reservoir Characterization and Well Testing</strong></td>
<td><strong>Reservoir Management, Surveillance, Interpretation</strong></td>
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<tr>
<td><strong>Applied Mechanics</strong></td>
<td><strong>Reservoir Modeling of Heavy Oil Resources</strong></td>
<td><strong>Reservoir Characterization</strong></td>
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<tr>
<td><strong>Integration of Rocks, Logs and Test Data</strong></td>
<td><strong>Reservoir Simulation Strategies</strong></td>
<td><strong>Reservoir Characterization</strong></td>
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<tr>
<td><strong>Produced Testing and Interpretation</strong></td>
<td><strong>Reservoir Simulation</strong></td>
<td><strong>Reservoir Characterization</strong></td>
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<td><strong>Capillary in Rocks</strong></td>
<td><strong>Reservoir Simulation</strong></td>
<td><strong>Reservoir Characterization</strong></td>
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<td><strong>Petrophysics of Unconventional Reservoirs</strong></td>
<td><strong>Reservoir Characterization and Management</strong></td>
<td><strong>Reservoir Management</strong></td>
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<td><strong>Core Properties</strong></td>
<td><strong>Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies</strong></td>
<td><strong>Reservoir Management</strong></td>
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<tr>
<td><strong>Production Geology for Other Disciplines</strong></td>
<td><strong>Reservoir Engineering for Other Disciplines</strong></td>
<td><strong>Reservoir Management for Unconventional Reservoirs</strong></td>
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<tr>
<td><strong>Petroleum Geology for Early Career Geoscientists and Engineers (see inside)</strong></td>
<td><strong>Enhancing Petroleum Engineering Practices</strong></td>
<td><strong>Production Technology for Other Disciplines</strong></td>
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<tr>
<td><strong>Basic Reservoir Engineering</strong></td>
<td><strong>Basic Drilling, Completion, and Workover Operations</strong></td>
<td><strong>Enhanced Basic Petroleum Economics</strong></td>
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<td><strong>Petroleum Business &amp; Professional Development</strong></td>
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<td><strong>Basics of HSE Management</strong></td>
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<td><strong>Health, Safety, Environment</strong></td>
<td><strong>Health, Safety, Environment</strong></td>
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**Unconventional Resource and Reserve Evaluation (p. 33)**

**Streamlines: Applications to Reservoir Simulation, Characterization and Management (p. 35)**

**Decline Curve Analysis (p. 34)**

**Reservoir Management (p. 33)**

**Horizontal and Multilateral Wells: Analysis and Design (p. 34)**

**Enhanced Oil Recovery with Gas Injection (p. 37)**

**Horizontal and Multilateral Wells: Construction and Stimulation (p. 45)**

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**Applied Reservoir Engineering (p. 29)** (Also Available as a Virtual/Blended Course)

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**Basic Reservoir Engineering Practices (p. 6)**

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**Applied Safety Management (p. 47)**

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**Applied Environmental Management (p. 47)**

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**Economics of Worldwide Petroleum Production (p. 54)**

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**Applied HSE Management (p. 47)**

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**Petroleum Risk and Decision Analysis (p. 50)**

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**Team Leadership (p. 58)**

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**Applied Engineering Management (p. 47)**

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**Applied Petroleum Economics (p. 46)**

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)

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**Petroleum Business & Professional Development** (p. 47)
**Basic Reservoir Engineering – BR**

**BASIC 5-Day**

This course is designed to help the participants develop a 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

**Also Available as a Virtual Course**

<table>
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<td>11 Jun-31 Aug</td>
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<td>10 Sep-16 Nov</td>
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**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 that 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, property correlations, PV testing, 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, Kvaalen-Odeh method, gas material balance, volumetric, compaction, water drive, and compositional fluid 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 Feltwisch methods of aquifer analysis and description • Immiscible displacement: fluid displacement process, fractional flow, Buckley Leverett, Wedge • Description of coring, capping, 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

**2018 Schedule and Tuition (USD)**

<table>
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*Note: plus computer charge*

**2018 Schedule and Tuition (USD)**

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<td>KUALALUMPUR, MYS</td>
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**2018 Schedule and Tuition (USD)**

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<tr>
<td>VIRTUAL</td>
<td>10 Sep-18 Jan</td>
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</table>

**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 relevant 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 engineer with whom they work. Participants should have three or more years of technical experience in the upstream petroleum industry.

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

Distribution of Reservoir Properties: structure, fluid contacts, water saturation, and pressure
- Rock Properties: porosity, permeability, capillary pressure, and relative permeability
- Fluid Properties: phase behavior of reservoir fluids; properties of gas, oil, and water; PVT Sampling; and PVT laboratory reports
- Volumetric Calculation of Initial Hydrocarbons in Place: oil in place, gas in place, addressing uncertainty using probabilistic methods, reservoir booking practices, and reservoir recovery efficiencies
- Material Balance Methods: oil reservoir material balance, Havlena Decline 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 or Immiscible Displacement: fluid displacement process, fractional flow, Buckley Leverett, Weber, 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
- 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
- Planning tools, deliverability issues, determining a well count and rate forecast
- Field Development Planning: characteristics, simulation model, conducting a simulation study
- 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

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

Introduction to well testing • Radial flow • Log-log 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

**Enhanced Oil Recovery Fundamentals – ORE**

**FOUNDATION 5-Day**

One-third to one-half of the original oil-in-place may remain in a reservoir as it reaches abandonment due to its economic limit. This course covers the recovery improvement process that provides 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 • Miscellaneous methods • Chemical methods • Thermal methods • Technical challenges current and future R&D directions, facilities modifications and personnel training

**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 fields • Overview of reservoir simulators for polymer flooding • Example simulations • Sulfactant/polymer (SP) methods • Sulfactant-brine-oil phase behavior • Micromodels • Capillary desaturation and oil mobilization • Laboratory screening • Field examples and designs • Reservoir simulators for SP • Example simulations • Alkaline/Surfactant/Polymer (ASP) methods • Effect of alkali on phase behavior • Laboratory screening • Field examples and designs • Reservoir simulators for ASP • Example simulations • Performance Control / Water Shutoff Methods • Overview of conformance control options (i.e. bulk gel, CDG, PPR, Bright Water) • Gel properties • Laboratory screening • Field examples and designs • Reservoir simulators for conformance control methods

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**2018 Schedule and Tuition (USD)**

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Enhanced Oil Recovery with Gas Injection – EORG

SPECIALIZED 5-Day

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

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

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

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

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

FOUNDATION 5-Day

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

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

YOU WILL LEARN HOW TO
• Identify the type of fluid in a particular reservoir and predict how that fluid will behave during production
• Read and 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
• Use laboratory data to determine values of fluid properties in the absence of laboratory data
• Shape PVT data to get the best results out of analytical and numerical software

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

Waterflooding A to Z – WF

FOUNDATION 5-Day

Waterflooding has long been proven as the simplest and the lowest cost approach to maintaining production and increasing oil recovery from an oil reservoir. However, these benefits may fall far short of the expectations unless the time-tested concepts and practices are clearly understood and judiciously implemented. 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 multidisciplinary teams. All class discussions and problem-solving sessions are handled in an asset management team format. Simulation studies are done in class to evaluate basic physical principles 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 process 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 development 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 • Fracture pattern • Natural and hydraulic fractures • Horizontal well applications

Waterflooding: Specialized 3-Day – WFS

This course goes beyond the usual description of waterflooding. The underlying purpose is 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 multidisciplinary teams. All class discussions and problem-solving sessions are handled in an asset management team format. Simulation studies are done in class to evaluate basic physical principles 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 process optimization of a waterflood project.

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

2018 Schedule and Tuition (USD)

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History Matching and Reservoir Optimization – HMRO

INTERMEDIATE 5-Day
This course is designed to cover state-of-the-art techniques and workflows for history matching, geologic and reservoir models for both conventional and unconventional reservoirs. The course will discuss manual and assisted history matching methods and also, inverse modeling techniques and the pros and cons of the methods. The production history data can be in the form of pressure or rate transient tests, tracer tests, multiphase production history, or interpreted 4D seismic information. Field examples will be presented to illustrate the current state of the art and the limitations. The use of history matched models for optimizing reservoir development and management strategies will be discussed. The course will involve a combination of theoretical discussion, practical applications, and computer exercises using public domain software to provide the participants with hands-on training on the workflows that can be applied using available commercial software.

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

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

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

Integrated Reservoir Modeling – GRD

INTERMEDIATE 5-Day
As the oil companies define business units and asset teams, it is becoming increasingly important that all the team members understand the workflow in developing integrated reservoir description for that asset. A proper development of reservoir description is helpful in managing daily operations of the asset, as well as long-term planning. Integration involves using all the available information about the reservoir to develop better understanding of the reservoir. This process is inherently interdisciplinary and requires understanding of all the disciplines. Although soft skills are important in working in an interdisciplinary team, this course concentrates on the hard skills required to develop a realistic reservoir description. Starting with collecting information and assessing the need for additional data, the course will cover all the topics from structural and geological modeling, estimation of reservoir Petrophysical properties using geostatistical tools, upscaling to simulator model and finally, proper history matching and future predictions in the presence of uncertainties. This course is important to reservoir modelers involved in any phase of the description work. This is intended to expose various geoscientists and engineers to the entire process of integrated reservoir description and the geostatistical tools that can be used to achieve the goals. The course will develop improved appreciation of the other disciplines’ needs as well as the necessity of the feedback during the integration process. The instructor of this course is willing to accept examples from your company for analysis in the class as one of the demonstration exercises.

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

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

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

Oil and Gas Reserves Evaluation – OGR

INTERMEDIATE 5-Day
Key objectives of this course are to learn various compliant methods of preparing reserves estimates, learn to estimate and understand the impact of economics on those estimates, and properly classify those reserves using the current reserves definitions. Recent case studies, SEC audit questions, and class problems are used extensively to develop an understanding of those skills and include ethical issues that arise when calculating and reporting reserves.

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

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

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

Reservoir Characterization: A Multi-Disciplinary Team Approach – RC

INTERMEDIATE 5-Day
The modern team approach to Reservoir Characterization describes production zones more reliably through the integration of disciplines, technology, and data. Increase your proven reserves, discover by-passed pay, reduce development time and costs, improve production rates, and rejuvenate old fields through the skills learned in this course. The course is process-based and focuses upon understanding the applicability of measurements and interpretations from the participant’s discipline to other adjacent disciplines, understanding information from other disciplines, and the uncertainties and risks involved in its gathering/interpretation, awareness of the latest technologies and working principles evolving on the cutting edge of the industry, managing a complex project to solve business problems in the most efficient manner, particularly when working in a difficult environment (multi-disciplinary teams, sponsors and bosses outside your expertise, cross purposes from disciplines), and working with both probabilistic and deterministic multiple working hypotheses throughout a hydrocarbon project.

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

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

YOU WILL LEARN HOW TO
- To develop a business case 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

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Reservoir Management

INTERMEDIATE 5-Day

The principles of sound reservoir management are presented with emphasis on practical applications. Actual case histories are used to study both successes and failures. An interdisciplinary 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 • Welfare and surface systems • Well testing and automated production systems • Economic impact of operating plans • Identifying and acquiring critical data, data acquisition, and analysis • Maximizing economic recovery and minimizing capital investment, risk, and operating expenses • Timing of field implementation of reservoir management plan • Case histories and analysis • Importance of reservoir characterization and drilling and operating plans • Primary recovery, pressure maintenance, and secondary and tertiary recovery • Responsibilities for team members

Reservoir Management for Unconventional Reservoirs

INTERMEDIATE 5-Day

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

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

Reservoir Modeling of Heavy Oil Resources

INTERMEDIATE 3-Day

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

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

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

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

Reservoir Simulation Strategies

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 exercises 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

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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.

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 heterogeneity 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, Stagl’s, P/2 vs. Qp, etc.) for rate and reserves analysis
• Use advanced decline curve and production data analysis for reservoir characterization

COURSE CONTENT
Conventional decline curve equations: exponential, hyperbolic and harmonic curve equations
• 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 compartmentalized 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 decline curve analysis and production forecast

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

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

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

COURSE CONTENT
Gas reservoir fluid properties: gas condensate sampling and understanding laboratory reports
• Gas reservoir fluid flow and well testing: deliverability testing and non-darcy flow, testing for hydraulically fractured wells, horizontal wells, and gas condensate reservoirs
• Determination of original gas-in-place: material balance techniques for various drive mechanisms and reservoir types, alternate plotting techniques, production decline type curves
• Gas flow in wells and pipelines: the gas production system, pressure drop in 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

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 potential 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
• Geologic structure characteristics
• Classification of advanced wells
• Reservoir inflow performance at different boundary conditions
• Wellbore flow and integrated well performance
• Confining 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

Naturally Fractured Reservoirs: Geologic and Engineering Analysis  – FR
SPECIALIZED  5-Day
FIELD TRIP
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

2018 Schedule and Tuition (USD)

BAKERFIELD, US  5-8 NOV  $2575
HOUSTON, US  21-22 MAY  $2665
OKLAHOMA CITI US  23-24 JUL  $2575

HOUStON, US  7-11 MAY  $4440
LONDON, UK  3-7 SEP  $5990+VAT

ALBUQUERQUE, US  14-18 MAY  $4590
HOUSTON, US  29 OCT-2 NOV  $4440
LONDON, UK  30 JUL-3 AUG  $5990+VAT

*Includes field trip

See website for dates and locations

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New Opportunities in Old Fields – NOF

SPECIALIZED 5-Day

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

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

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

COURSE CONTENT
Why Opportunities Emerge: nature of reserves growth; operating practices and their effect on new opportunities; the contribution of evolving technology • Recognizing Opportunities: reservoir characteristics and production performance indicative of new opportunities, unravelling limited data, linking operator practices to new opportunities • Reserves versus U可持续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

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 well pairs
• Perform reservoir surveillance and flood optimization using streamlines
• Integrate streamlines with finite-difference simulators
• Perform streamline assisted history matching of reservoir models
• Apply streamline simulation for complex reservoir geometries and flow processes

Unconventional Resource and Reserve Evaluation – URRE

SPECIALIZED 5-Day

This five-day advanced course is designed to expose attendees to the understanding and application of the latest techniques, methods, and requirements being applied to reserves evaluation within unconventional resources. Particular focus is given to actions and methodologies that are necessary to enhance the reserve categorization. Discussion and class examples will emphasize the testing protocols necessary within the exploration, appraisal, and development phases of the resource life cycle. The course is based around the Petroleum Reserve Management System (PRMS), Variations needed to conform to other national standards such as the SEC, N-51, 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/CSS, and hybrid plays
• Compute gas/oil in place and estimated ultimate recovery in unconventional resources
• Design a data collection program appropriate within the exploration, appraisal and development phases of an asset life cycle
• Apply analysis of core analysis, well test data, and proximate analyses to enhance reserve estimation
• Describe the advantages and disadvantages between various reserve estimating techniques including decline curve, rate transient, and the probabilistic approach
• Differentiate between various reserve and resource accounting methods
• Differentiate between prospective resources, contingent resources and reserves
• Summarize the concepts of ‘reasonable certainty’ and ‘reliable technology’
• Create a unconventional reserve growth portfolio
• Minimize unconventional reserve write-downs

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

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- Reservoir Fluids
- Exploration and Appraisal
- Development and Production
- Mature Assets and Abandonment
- Midstream
- Gas Manufacturing
- Refining
- Petrochemicals

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2018 Schedule and Tuition (USD)

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*plus computer charge

See website for dates and locations
# 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 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:

- Mr. Alex Andre ChwetzoFF
- Mr. PAul Barry
- dr. oMAr BarkAt
- dr. AhMed BadruzzAMAn
- Mr. Ahmed BadruzZaman
- Dr. ISkander DhyasheV
- Mr. PAul Barry
- Dr. DAle Fitz
- Dr. VerseLL Friz
- Mr. Larry BritT
- Dr. Steve Cheung
- Mr. Alex Andre ChwetzoFF
- Mr. DAn Gibson
- Mr. DOn Johnson
- Dr. John MartiNez
- Dr. Howard MckNittE
- Mr. JEFFrey McMullAN
- Mr. StEvE Metcalf
- Dr. howArd MCkinzie
- Dr. CliFF redus
- Dr. iSkander diyAShev
- Mr. BoB niChol
- Mr. MAniCAM nAdAr
- Mr. PAtriCk MorAn
- Mr. SCott wilSon
- Mr. BoB weSterMArk
- Mr. huGo vArGAS
- Mr. AAron horn
- Mr. kyle traviS
- Mr. ARnold hArriSon
- Mr. kenneth Stack
- Mr. Richard Schroeder
- Mr. subrInk shAh
- Mr. Kyle traviS
- Mr. jEfFrey MCmullAN
- Dr. CliFF redus
- Mr. kenneth Stack
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- Mr. Kyle traviS
- Mr. JAMeS leA, Jr.
- Dr. JAMeS leA, Jr.
- Mr. PAtriCk MorAn
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- Dr. CliFF redus
- Mr. kenneth Stack
- Mr. Richard Schroeder
- Mr. subrInk shAh
- Mr. Kyle traviS

## Course Progression Matrix:

|-------|---------------------------------|-----------------------------------|-----------------------------------------------|-------------------------------------------------|----------------------------------------|------------|-----------------------------|
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 • Safely aspects of well design • Wellheads, trees, subsurface safety valves, and flow control equipment • Material selection guidelines based on corrosion and erosion conditions • Understanding 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

Forbidding job selection and design • Formation damage mechanisms and remediation • Stimulation design considerations • Sand control algorithms and their selection • Wireline, coiled tubing, and hydraulic workover rig operations • Snubbing

**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 aim to strike a balance between learning to transfer knowledge, cost, 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 exploration 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 as multi lateral, extended reach, and intelligent wells
- Design both conventional and unconventional multi stage horizontal completions
- Apply successful primary casing cementing and remedial repair techniques
- Select equipment and apply practices for perforating
- Plan well intervention jobs using wireline, snubbing, and coiled tubing methods
- Manage corrosion, erosion, soluble and insoluble scales, and produced water handling challenges
- Apply well completion and workover fluid specifications for solids control and filtration
- Employ the five main types of artificial lift systems
- Identify formation damage and apply remedial procedures
- Design and execute successful carbonate and sandstone reservoir acidizing programs
- Understand the causes of sand production and how to select sand control options
- Understand the proper use of oilfield surfactants and related production chemistry
- Identify and successfully manage organic paraffin and asphaltene deposits
- Choose cased hole production logging tools and interpret logging results
- Understand modern conventional fracture stimulation practices
- Understand multistage, horizontal well shale gas and shale oil massive frac job design and operations
- Review heavy oil development and extraction including mining operations and current modern thermal processes

**COURSE CONTENT**

Importance of the geological model • Reservoir engineering fundamentals in production operations • Understanding inflow and outflow and applied system analysis • Well testing methods applicable to production operations • Well completion and related equipment • Primary and remedial cementing operations • Perforating design and applications • Completion and workover well fluids • Well intervention: wireline, hydraulic workover units, and coiled tubing • Production logging • Artificial lift completions and non-pump, gas lift, ESP, PCP plunger lift, and jet others • Problem well analysis • Formation damage • Acidizing • Corrosion control • Scale deposition, removal, and prevention • Surfactants • Paraffin and asphaltene • Sand control • Hydraulic fracturing • Unconventional resources: shale gas and oil, heavy oil and bitumen

**2018 Schedule and Tuition (USD)**

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**Virtual 2018 Schedule and Tuition (USD)**

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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 • Sand control • Hydraulic fracturing • Formation damage and well acidizing • Perforating • Completion design • Inflow and outflow • Role and tasks of production technology • Design sand control gravel pack completions • Understand the chemistry and execution of sandstone and carbonate acid jobs • 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

Well Stimulation: Practical and Applied - WS

BASIC 5-Day

Too often in today’s 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 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 stimulation treatments in conventional as well as unconventional plays, including the shales. This includes completion, production, reservoir, and drilling engineers; field supervisors; production engineers; 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

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 behavior of this course is to improve communication among all disciplines, the field, and the office. Better communication should enhance operational efficiencies, lower costs and improve production economics. Example step-by-step exercises are worked together with the instructor to drive home the important points. Daily sessions include formal presentation interspersed with a good number of questions, discussion and problem solving.

DESIGNED FOR

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

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 knockout, centrifugal, filter • Storage tanks, gun barrels, pressure/ vacuum relief, flame arrestors • Stabilizers • Foams, emulsions, paraffins, asphaltene, hydrates, salts • Dehydrators • Water treaters: SP packs, plate interceptors, gas flotation, demulsifiers, 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/Scalation: inhibition and treatment

Coiled Tubing Interventions - CTI

FOUNDATION 5-Day

Coiled Tubing is one of the most common technologies used for well intervention 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, the details of the different types of interventions performed with Coiled Tubing and how to deal with emergency interventions. Participants will also learn to calculate the string operating limits and the volumes and rates during nitrogen interventions. 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.

DESIGNED FOR

Drilling, completion, production, surface/ subsurface, operations, and field engineers; and service company managers, supervisors and operators.

YOU WILL LEARN HOW TO

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

COURSE CONTENT

Introduction • Surface equipment • Pressure control equipment • Bottomhole assembly components • Pumping operations • Mechanical operations • CT drilling operations • Coiled tubing strings • Operational limits • Life estimation • Fatigue • Corrosion • String management • Checklists • Nitrogen • Emergency responses and contingencies

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THE HAGUE, NETHERLANDS 5-9 NOV $4915

2018 Schedule and Tuition (USD)

HOUSTON, US 17-21 SEP $4140

2018 Schedule and Tuition (USD)

DUBAI, UAE 16-20 DEC $5240
HOUSTON, US 5-9 NOV $4140
KUALA LUMPUR, MYS 7-11 MAR $4190
LONDON, UK 29-30 MAY $4990+VAT
MIDLAND, US 1-5 OCT $4090
SAN ANTONIO, US 16-20 JUL $4090

*plus computer charge
Unconventional Resources Completion and Stimulation – URCS

FOUNDATION 5-Day

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

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

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

FOUNDATION 5-Day

Nodal analysis views the total producing system as a group of components potentially encompassing reservoir rock/irregularities, completions (gravel pack, open/closed perforations, open hole), vertical 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 is 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, evaluating 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
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, asphaltene, 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 • Asphaltene • 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 • Near-wellbore control • Near-wellbore techniques • Matrix applications • Fractures and voids • Water control • Bringing it all together • Engineered process • Initial screening • Reservoir characterization • Simulation • Case studies

Hydraulic Fracturing Applications – HFU

INTERMEDIATE 5-Day

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

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

Advanced Hydraulic Fracturing – AHF

SPECIALIZED 5-Day

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

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-fract injection test data and real-time fracturing treatment data in fracturing applications to define fracture parameters and improve frac treatment design
• Consider factors influencing post-fracture conductivity and well cleanup
• Realize the strengths and limitations of existing hydraulic fracturing technology and fracture models
• Expand fracturing applications to fit a wider range of reservoir types and conditions

COURSE CONTENT
Rock properties and fracture mechanics related to the fracturing process • Fracturing fluid mechanics • Proppant transport • Pre-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-fract well performance

Acidizing Applications in Sandstones and Carbonates – ASC

INTERMEDIATE 5-Day

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

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 stimulation
• Recognize the strengths and limitations of acidizing
• 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

2018 Schedule and Tuition (USD)

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

FOUNDATION 5-Day
This course blends lecture, hands-on exercises, and seminar teaching styles to enhance learning. Participants work with software that allows them to design and analyze artificial lift 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 pumps. 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 lifting 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
• 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 • Criteria for selection of artificial lift system • Reservoir performance: inflow and outflow relationships • Artificial lift screening • Economic analysis includes initial and operating costs, production potential, etc. • and more...

2018 Schedule and Tuition (USD)

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*plus computer charge

Beam Pumps – BP

INTERMEDIATE 5-Day
This course will allow the user to become familiar with the beam pump system and when it should be used. It has been said that beam pumping is the most economical form of artificial lift and should be used when it is economically possible. It is the most common form of lift compared to ESP/Gas Lift/ Hydraulic/PCP pumps. All components will be described in detail including the prime mover, belts/sheaves/gear box, PRs, wellhead, stuffing box, sucker rods/sinker bars and downhole pumps. Design and analysis will be done using industry computer software. Films will be shown mostly illustrating either new products or best practices. A few problems will be solved by class participants each day. Comparisons with other systems to select the best system for a given well, whether it may be beam pumping or another method of lift; example problems will also be shown throughout the class. Problems addressing solids, gas handling, and viscosity are addressed. Best practices are stressed throughout so that a long lasting system can be developed for maximum profit. New material will also be presented on beam pumps and rod protection in horizontal wells, placement of pump, deviation surveys, and performance of gas separators. New methods of deepening the point of intake for horizontal and unconventional wells are presented with field 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 for best efficiency, economical optimum production, longer life between failures, best energy efficiency and safe operation considering field constraints
• Maintenance and monitor using POC’s (v/RF and VSD types)
• Identify components of the system and select optional components for best operation characteristics
• Design and analyze a system using computer software
• Monitor with SCADA systems
• Apply best practices for longer system life

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

Electrical Submersible Pumps – ESP

INTERMEDIATE 5-Day
FIELD TRIP
This course will allow the user to become familiar with the ESP system and when it should be used. All components will be described in detail. Design and analysis problems will be done using industry computer software. Some films will be shown mostly illustrating installation, operation, and removal of failed equipment, new products, and best practices. Problems will be solved and discussed by the class participants each day. Comparisons are made to other lift methods to help facilitate AL method selection. Problems addressing solids, gas handling and viscosity are addressed. Best practices are stressed throughout so that a long lasting system can be developed for maximum profit. SCADA controls and VSDs are discussed. Participants will learn the function of the various components, and the concerns about installation, operation, and removal of failed equipment. The participant will be able to evaluate the design of a system for current and future conditions, analyze an installed system, and many other operational concerns of the ESP system. New developments are added to the course as they become available to the industry. 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
• Economically maximize oil production using ESP systems
• Identify components of the ESP system and their function, and how to select optional components and add-ons
• Design and analyze a system using computer software
• Implement best practices for longer system life
• Improve power efficiency of the system
• Manage gas, solids, corrosion, and viscosity in the produced fluids
• Compare to other artificial lift methods
• Monitor systems and types of sensors that are available

COURSE CONTENT
Introduction to artificial lift and electrical submersible pumping • Introduction for reservoir and production considerations • Description of all components of the electrical submersible pump system at the surface • Installation considerations and cautions • Design of an ESP system to fit current and future well conditions • Operation of a given system • Analysis of an ESP system using diagnostics from installed instrumentation and using computer software • Removal of failed equipment • Troubleshoot analysis of failed equipment and ROFA considerations • and more...

2018 Schedule and Tuition (USD)

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**Our Participants Say It Best.**

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

**JESSICA**  
BASIC GEOPHYSICS • BGP • HOUSTON

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

**KABIR**  
PERFORMANCE ANALYSIS, PREDICTION AND OPTIMIZATION USING NODAL ANALYSIS • PCO • DUBAI

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

**DEREK**  
BASIC DRILLING, COMPLETION AND WORKOVER OPERATIONS • B&G • BAXERSFIELD

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**Gas Lift — GLI**

**INTERMEDIATE 5-Day FIELD TRIP**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

- Select the appropriate gas lift systems and equipment
- Design continuous-flow gas lift systems
- 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

**2018 Schedule and Tuition (USD)**

- **ABERDEEN, UK**  
  13-17 AUG  $55265+VAT
- **DUBAI, UAE**  
  28 OCT-1 NOV  $5465
- **HOUSTON, US**  
  17-21 SEP  $4365
- **MIDLAND, US**  
  23-27 APR  $4315

*plus computer charge† includes field trip

See website for dates and locations

**Plunger Lift — PLS**

**INTERMEDIATE 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

Listen to what course attendees are saying! Go to petroskills.com/listen
Flow Assurance for Offshore Production — FAOP

INTERMEDIATE 5-Day

Flow assurance is a critical component in the design and operation of offshore production facilities. This is particularly true as the industry goes deeper to greater water depths, new fields, and extremely high temperatures and pressure reservoirs. Although gas hydrate issues dominate the thermohydraulic design, waxes, asphaltens, emulsions, scale, corrosion, erosion, and solids transport, slugging, and operability are all important issues which require considerable effort. The participant will be presented with sufficient theory 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 systems.

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 (wax), asphaltens, 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

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 other 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 (lines 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

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, choking, 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; office metering design, accuracy, troubleshooting; other metering methods • Condensate reservoirs: reservoir types - wet gas, retrograde behavior, flash calculations; well testing: gas well performance from reservoir to sales

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, 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
• Basic install and troubleshoot the various methods
• Understand economics of each method covered

COURSE CONTENT
Recognize symptoms of liquid loading in gas wells • Critical velocity to analyze wells loading or not • Optimize techniques with nodal analysis • Sizing tubing • Compression: selection, sizing, and operation • Plunger lift: coltinous (bypass), conventional and gas assisted • Use of foam to dewater gas wells • Hydraulic pumps • Use of beam pumps to dewater gas wells • Gas lift • Electrical submersible pumps • Progressive cavity pumps • Other methods to solve liquid loading problems

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

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INTERMEDIATE 5-Day

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

DESIGNED FOR
Production engineers, 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 that might require treatment chemicals.

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

COURSE CONTENT
Corrosive agents • Corrosion inhibitor selection and application • Predicting and monitoring corrosion rates • Basics of oilfield emulsions • Demulsifier selection and field application • Foams • Deformers • Foam basics • Field application of foams • How deformers 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 H2S scavengers • Application of H2S scavengers • Oil carryover in water • Removal of oil and oily solids • Tests required for chemicals used in deep water • Green chemicals (environmentally friendly chemicals)

2018 Schedule and Tuition (USD)
VIRTUAL 9-25 APR 2018 $1628
4-30 SEP 2018 $1628

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

INTERMEDIATE 5-Day

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

DESIGNED FOR
Petroleum and drilling engineers and managers, reservoir engineers, subsurface engineers, production engineers/technologists, petrophysicists, log analysts, and anyone interested in understanding production logs and 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
• Identify flow behind pipe with temperature, radioactive tracer, and spinner (flowmeter) measurements
• Interpret cement bond logs and ultrasonic logs to determine cement quality
• Measure flow inside and outside casing with pulsed neutron tools
• Apply specially tools (array holdup and spinners and pulsed neutron tools) for flow profiling in high angle/horizontal wells
• Confirm the location of some types of completion components using pulsed neutron measurements
• Design a logging program using the appropriate production logging services for well diagnosis and reservoir surveillance

COURSE CONTENT
Wellbore environment and tool deployment considerations • Depth control issues and natural gamma ray logging • Cement bond logs • Ultrasonic imaging logs • Conventional temperature logs • Conventional spinner (flowmeter) logs • Conventional fluid 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 and more...

2018 Schedule and Tuition (USD)
DUBAI, UAE 7-11 OCT $5440
HOUSTON, US 10-14 DEC $4340
LONDON, UK 16-20 JUL $4990+VAT

*plus computer charge

2018 Schedule and Tuition (USD)
DUHAIL, UAE 15-19 OCT $4340
HOUSTON, US 19-23 OCT $4340
LONDON, UK 13-17 AUG $4990+VAT

INTERMEDIATE 5-Day

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 preparation and enhanced prepackaging • Frac packing • Open hole gravel packing • Expandable screens • Gravel pack performance • Horizontal well completions
**Surface Water Management in Unconventional Resource Plays – SWM**

**INTERMEDIATE**  
3-Day

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

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

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

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

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**Water Management in Heavy Oil Resource Operations – HOHW**

**INTERMEDIATE**  
3-Day

This course will review the basics of heavy oil extraction and the characteristics, quality, and quantities of waters in heavy oil resource operations. It will examine the interpretation of analytical results and simulation resources including heavy oil and bitumen extraction use of water, limitations, and typical ratios. The scientific basis and principles of de-oiling technologies, chemical (hot and warm) lime softening (including sludge disposal), ion exchange SAC and WAC technologies, BFW chemistry, and OTSG boilers. Equipment scaling and corrosion problems will be included. It will review technologies of evaporators. Recent and developing new technologies for produced water recovery will be discussed. Real life cases will be reviewed and evaluated. Finally, this course will review the most prominent environmental limitations.

**DESIGNED FOR**
Process designers and CPF operators dealing with heavy oil produced water separation, recovery and treatment for reuse or disposal. Personnel involved in establishing, improving or supervising the implementation of technology improvements. This course will be useful to managers in completion, production and optimization of operations.

**YOU WILL LEARN HOW TO**
- Understand technology options, advantages, and limitations
- Choose the most advantageous technology given the site conditions
- Design or specify the equipment capable to fulfill the operations intended
- Optimize design conditions and operating efficiency
- Troubleshoot field situations
- Understand water mass and ionic/solids balance
- Review field cases

**COURSE CONTENT**
- Heavy oil review
- Water properties and analytical key parameters, review of analytical results, what is logic, what is out of line
- Thermo-extraction produced water, the process (SAGD and CSS), ratios
- De-oiling technologies, traditional, deviations, and future
- Softening and silica removal, hot and warm lime softening
- Ion exchange technology, SACs and WACs technologies, the out of vessel regeneration
- Backwash, regeneration and separation sludge: collection, thickening, and dehydreation
- Boiler feed water final treatment, standard requirements and chemical conditioning
- Evaporator alternatives and 2LD technology
- Tube corrosion and scaling in boilers and evaporators
- Mixing 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

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**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 multilateral and horizontal 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 wells applications
- Well performance prediction
- Wellbore stability of horizontal wells
- Stress field effect on drilling, completion, production, and stimulation
- Geosteering
- Multilateral well structure, junction, and applications
- 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

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**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 many water-related problems of mineral scales, corrosion, bacteria, and oily water will be reviewed both from the theoretical and practical aspects. Produced water treatment equipment and typical water quality specifications will also be reviewed, as well as water injection and disposal systems. An exercise will be given to identify typical system problems and to apply the knowledge you 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

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2018 Schedule and Tuition (USD)

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2018 Schedule and Tuition (USD)

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+1.918.828.2500  petroskills.com  |  +1.800.821.5933 (toll free North America)
The Course Progression Matrix below shows how the HSE courses in this section are structured within each topic, starting with Basic level. These matrices are ideal for building training plans for early-career staff or finding the right course to build upon existing knowledge and experience.

We have had great success in bespoking/customizing our classes to include the HSE management systems of our members and clients. We also provide other classes and consulting including risk and impact assessment, incident investigation, and emergency preparedness and response.

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

- MR. STEPHEN ASBURY
- MR. RICHARD BOOTHMAN
- MR. MARK BOWERS
- MR. STEWART CLARKE
- MR. CHRISTOPHER DOUGHERTY
- MR. PHILLIP DUCKETT
- MS. KERRY EDWARDS
- MR. MARTYN GRANT
- MR. ANDREW NEWBROUGH
- MR. NAOMI WARR
- MR. DAVID WHITELEG
- MR. CYLDE YOUNG

The PetroBarola Case Study:

- The PetroBarola Case Study is a fictitious but highly-realistic case study. Participants work as a team to develop and improve the environmental management system (EMS) and environmental performance of company Petro, a fictitious but highly-realistic case study.
- Application of the learned techniques is practiced on the upstream Caspian Explorer platform and the downstream Orkney Depot.
- The course is designed to introduce participants to solutions to environmental challenges and to become an agent for change in their own organization.

**Competent Person Fall Protection – FPST**

**Foundation 5-Day**

This course provides hands-on opportunities to learn and apply tools, techniques, and systems of environmental management in oil, gas, and petrochemical industries. Participants work as a member of a team to develop and improve the environmental management system (EMS) and environmental performance of company Petro, a fictitious but highly-realistic case study. Application of the learned techniques is practiced on the upstream Caspian Explorer platform and the downstream Orkney Depot.

The course is designed to introduce participants to solutions to environmental challenges and to become an agent for change in their own organization.

**Course Content**

- Effective use of an EMS • Identifying aspects and assessing impact • Environmental improvement programs, including pollution abatement and control techniques • Emergency preparedness and response • Environmental communication • Environmental performance monitoring • Environmental auditing and reporting • Management review

**2018 Schedule and Tuition (USD)**

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See website for dates and locations.
### Applied HSE Management – HS28

**FOUNDATION 5-Day**

In just five days, learn how to develop and use an HSE management system to drive improvement and learning into your organization! This course is about understanding and applying common HSE management systems in oil, gas and petrochemical industries. It includes a rich blend of knowledge development sessions, individual and team exercises, problem-solving, and sector case studies. These come together to challenge participants in a realistic but fictional case study facility, PetroSkills Barola Limited.

Course content is built around the PetroSkills competence maps at the Fundamental Application level.

**DESIGNED FOR**

Functional specialists seeking to improve their knowledge and application of HSE management systems, including operations supervisors, engineers, contract managers, project managers, and all staff who have the responsibility for designing, implementing, or supporting HSE management. Some prior knowledge of HSE management related topics is desirable but not essential.

**YOU WILL LEARN HOW TO**

- Successfully apply the principle elements of an HSE management system aligned to the international standards ISO 14001 (environment) and OHSAS 18001 / ISO 45001 (occupational health and safety), and how to relate these to company management systems
- Explain responsibilities for HSE management and the characteristics of successful leadership and management styles
- Use key tools associated with HSE management including hazard, risk assessment, JHA, JSA, PTW, LOTO, and active (leading) and reactive (lagging) monitoring
- Shape and initiate improvement in the safety culture of their own organizations

**COURSE CONTENT**

Leadership and commitment • HSE policy and strategic objectives • Legislation and regulation • Organization, responsibilities, and resources • Professional training and behavior • Risk assessment and hierarchy of control • Planning and procedures • Contractor controls • Security • Emergency preparedness and response • Performance management • Incident reporting and investigation • Auditing • Management review and improvement

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### Fundamentals of Process Safety – PS2

**FOUNDATION 5-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN HOW TO**

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

**COURSE CONTENT**

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

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### 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 test 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 hazards
- Describe the criteria and methods of selecting equipment and safety 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

For more information, go to petroskills.com/elearning
Extend Learning into the Field

<table>
<thead>
<tr>
<th>PG</th>
<th>2018 COURSES WITH FIELD TRIPS</th>
<th>LOCATION</th>
<th>DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>ANALYSIS OF STRUCTURAL TRAPS IN EXTENSIONAL SETTINGS - ESS</td>
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<td>See website</td>
<td>CO2 SURFACE FACILITIES - PF-81</td>
<td>Midland, US</td>
<td>12-15 Nov 2018</td>
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<td>Houston, US</td>
<td>17-21 Sep 2018</td>
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<td>12-16 Nov 2018</td>
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<td>Houston, US</td>
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<td>6</td>
<td>FIELD STUDY-HEAVY OIL RESOURCES - HOFS</td>
<td>Fort McMurray, Canada</td>
<td>27-29 Aug 2018</td>
</tr>
<tr>
<td>42</td>
<td>GAS LIFT - GLI</td>
<td>Aberdeen, UK</td>
<td>13-17 Aug 2018</td>
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<tr>
<td>See website</td>
<td>MECHANICAL SPECIFICATION OF PRESSURE VESSELS AND HEAT EXCHANGES - ME-43</td>
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<td>17-21 Sep 2018</td>
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<td>27</td>
<td>STRUCTURAL AND STRATIGRAPHIC INTERPRETATION OF DIPMETERS AND BOREHOLE-IMAGING LOGS - SSI</td>
<td>Denver, US</td>
<td>1-5 Oct 2018</td>
</tr>
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</table>

For a full list of field trip courses, see petroskills.com/geoexpro
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 efficiently
- Development of organizational competence

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

Maintenance Planning and Work Control – OM41

FOUNDATION 5-Day

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

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

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

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

Introduction to Data Management – IDM

BASIC 2-Day

This course provides an overview of data management in E&P, focusing on the subsurface domain. The need to deliver good data management is increasingly being seen as providing competitive advantage across the E&P industry, since wise business decisions depend on sound data and information. Participants will leave this course with an understanding of the core E&P data types, their use in the business, and data management issues and challenges facing companies. You will have the knowledge and tools necessary to participate in developing a structured data management framework, which will deal with these issues in a practical and effective manner to ensure business efficiency and value is realized. This course provides an understanding of essential E&P data management principles and concepts using an interactive classroom format; participants will have the opportunity to learn from presentations, exercises, and interactive discussions. Course instructors are experienced data management practitioners, who have delivered services and projects to many E&P companies, from small independents to super majors.

DESIGNED FOR
Those looking to improve their organization’s ability to capture, manage, and deliver high-quality data. The course is foundational; it will be of most benefit to those with little or basic prior understanding of technical data used in the E&P industry. Course attendees may hold a variety of roles such as data or information managers, technical managers and assistants, technologists, geologists, geophysicists, etc.

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

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

Geomatics: Geodesy and Cartography – GEOM1

FOUNDATION 2-Day

Use of incorrect geodetic parameters can cause major errors in positions of wells, pipelines, and seismic surveys, with significant financial losses and sometimes with HSE risks, as demonstrated by case studies. Awareness of geodetic datums, coordinate reference systems, and map projections is provided via interactive demonstrations and hands-on workshops exercises using the online EPSG Geodetic Registry. Participants learn how Global Navigation Satellite Systems (GNSS) including GPS work, as well as the resultant accuracies obtainable using different receiver types and data processing techniques. Hands-on GPS exercises show potential errors. “Google Earth” is examined with focus on its strengths and weaknesses for E&P purposes. Lastly, the importance of geospatial metadata is stressed, since often such metadata is implemented at the end of a project. This critical geospatial data component is discussed with recommendations for “best practices” using current industry references.

DESIGNED FOR
Geologists, geophysicists, exploration and production managers, reservoir engineers, drilling engineers, data acquisition and data managers, and GIS specialists.

YOU WILL LEARN
- To identify “bad” geodetic parameters within your project data, and ensure that geodetic parameters provided to you are correct
- Advantages and disadvantages of using various map projections
- To apply this course to projects in your specific geoscience software applications
- Evaluation of geospatial metadata in your projects; learn how to generate good geospatial metadata
- The limitations on “reasonable use” of Google Earth for your own applications
- The accuracy limits of different types of GNSS/GPS receivers and technology

COURSE CONTENT
How much trouble coordinate errors can cause (with case studies) • Key geomatics/geodesy definitions • Geodetic reference surfaces • Geodetic datums, coordinate reference systems, and transformations • Global Navigation Satellite Systems (GNSS), including GPS • Map projection methods • What is “North”? • Effects of different linear units • Vertical datums, geoidal models, vertical CRS, and transformations • Google Earth and associated geospatial data issues • Geospatial metadata: what is it and how can it be made part of the normal workflow process • Recap and course references

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

+1.918.828.2500 | petroskills.com | +1.800.821.5933 (toll free North America)
Datum transformations • The EPSG Geodetic datasets and coordinate reference systems • Exporting and projecting vector data • Raster
• Develop the ArcGIS skills required to manage • Utilize ArcGIS functionality to import spatial • Explore the benefits in applying Geographic relevant ArcGIS skills and knowledge.
be building and managing spatial data for professionals and support staff who are going to
reserves calculation. modeling in wrong location, and incorrect positioning of geohazards, interpretation and mistakes, such as drilling in the wrong location, damage to existing infrastructure, incorrect positioning of geohazards, interpretation and modeling in wrong location, and incorrect reserves calculation.

DESIGNED FOR
Data management, IT, geoscience, and other professionals and support staff who are going to be building and managing spatial data for specific projects, assets, or company-wide data stores and need to be able to acquire the relevant ArcGIS skills and knowledge.

YOU WILL LEARN HOW TO
• Explore the benefits in applying Geographic Information Systems (GIS) to your petroleum workflows • Utilize ArcGIS functionality to import spatial and non-spatial databases; integrate, manage, and analyze data to produce information for decision making
• Use industry standard ArcGIS tools, including ArcMap, ArcCatalog, and ArcToolbox
• Develop the ArcGIS skills required to manage coordinate reference systems • Better understand petroleum CRS sector standards
• Understand the workflows required to undertake datum transformations • Work through common problems encountered in oil and gas and develop a strategy for dealing with these issues

COURSE CONTENT
Properties of coordinate reference • Systems map projections and the ArcMap Data Frame • Exporting and projecting vector data • Raster datasets and coordinate reference systems • Datum transformations • The EPSG Geodetic Parameter Dataset

Build an EPSG GIS Spatial Data Infrastructure (SDI) • Create and load a geodatabase, feature datasets, feature classes, and a raster catalogue • Import well, lease, seismic, and raster data • Generate and update metadata • Check and improve the quality of spatial data • Manage and archive an SDI • Discuss how ArcGIS interfaces with third party systems

ArcGIS Coordinate Reference Systems for Petroleum – GISF

FOUNDATION 1-Day

With a view to encouraging good practice within the oil and gas exploration and production (E&P) sector, the emphasis in this course is on developing the ArcGIS Desktop skills you need to successfully manage coordinate reference systems (CRS) issues within ArcView. All spatial data is concerned with location on the surface of the earth and this “position” is governed by the parameters of the CRS employed. If you do not manage coordinate reference systems correctly, your data could be incorrectly located with the potential for costly disasters and mistakes, such as drilling in the wrong location, damage to existing infrastructure, incorrect positioning of geohazards, interpretation and modeling in wrong location, and incorrect reserves calculation.

ArcGIS Data Management for Petroleum – GSD

SPECIALIZED 2-Day

This course takes you through the development of oil and gas exploration and production (E&P) spatial data infrastructure. Using ArcGIS Desktop tools, you will be guided through the hands-on process of structuring and loading an E&P GIS using a realistic collection of well, surface, and subsurface data sources from an operating field. You will also develop an understanding of how to implement metadata in a petroleum-focused spatial data infrastructure. This course focuses on the management of a spatial data infrastructure and is geared towards helping you develop the skills needed to manage data quality and refresh datasets without compromising the integrity of the data store. Participants with GIS expertise but who are new to the oil and gas sector will gain a more thorough understanding of the spatial data management issues.

ArcGIS Essentials for Petroleum – GSE

FOUNDATION 2-Day

This is an entry-level course that teaches you how to use Esri’s ArcGIS Desktop within oil and gas exploration and production activities, using petroleum industry spatial data and workflows. This course allows you to explore the benefits in applying Geographic Information Systems (GIS) to your petroleum workflows. You will be introduced to fundamental ArcView functionality that allows geoscientists to import spatial and non-spatial databases, and integrate, manage, and analyze data to produce information for decision making. No geospatial knowledge is assumed beyond that acquired through the use of geological maps. Although petroleum exploration and production (E&P) sector knowledge is not required, this course is geared towards assisting participants to implement E&P workflows geospatially.

Designed for Geoscience professionals and support staff who are going to be using GIS tools, and E&P project staff who need a basic understanding of GIS in order to manage geospatial projects.

You will learn how to
• Explore the benefits in applying Geographic Information Systems (GIS) to your petroleum workflows • Utilize ArcGIS functionality to import spatial and non-spatial databases, and integrate, manage, and analyze data to produce information for decision making
• Use industry standard ArcGIS tools, including ArcMap, ArcCatalog, and ArcToolbox
• Focus on learning how to put E&P workflows through ArcGIS • Set up an E&P project • Join spatial data to a well database • Create a well layer from tabular X and Y coordinates • Digitize a fault map and edit a play fairness map • Undertake spatial and attribute queries • Export data into a number of formats • Produce professional map layouts • Update a play fairness and assess potential acreage

Course content Setting up an E&P project • Managing E&P data layers • Georeferencing images • Joining spatial data to tabular well data • Linking spatial data to a well database • Creating simple hyperlinks • Building hyperlinks into an attribute table • Digitizing a fault map • Editing a simple play fairness • Spatial data queries • Attribute query with SQL • Simple spatial data analysis • Exporting attribute tables • Producing map layouts • Exporting map images • Updating the play fairness • Assessing potential acreage

Seismic Positioning Data Management – SPDM

DESIGNED FOR
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 consider good practice 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.

You will learn how to
• Analyses 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 exercises 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

2018 Schedule and Tuition (USD)

HOUSTON, US
9 MAY
$870
*plus computer charge

HOUSTON, US
10-11 MAY
$1740
*plus computer charge

HOUSTON, US
7-8 MAY
$1740
*plus computer charge

HOUSTON, US
4-5 JUN
$2525
*plus computer charge

PETROLEUM DATA MANAGEMENT

2018 Schedule and Tuition (USD)

HOUSTON, US
9 MAY
$870
*plus computer charge

HOUSTON, US
10-11 MAY
$1740
*plus computer charge

HOUSTON, US
7-8 MAY
$1740
*plus computer charge

HOUSTON, US
4-5 JUN
$2525
*plus computer charge

These courses are offered separately or together as a one-week Data Management Pathway. Completing the Data Management Pathway provides the skills and knowledge required to effectively manage and extract full value from geographical data.
Introduction to Petroleum Business — IPB

BASIC 3-Day

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

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

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

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

Basic Petroleum Economics — BEC3

BASIC 3-Day

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

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

YOU WILL LEARN
• How to evaluate the economic viability of a project
• Cash flow techniques applicable in economic evaluations
• How to use economic criteria to choose investments
• Models to weigh risk and uncertainty

COURSE CONTENT
Forecasting oil production • Defining: “reserves”, operating expenses, capital expenditures, inflation, factors 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 • Tips on economic factors in computer spreadsheet analysis • Ethics in economic analyses

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

2018 Schedule and Tuition (USD)

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
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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 in which criteria to use for best results? Answers to these questions will greatly improve your ability to make profitable decisions. Techniques for predicting profit, production, operating costs, and cash flow enable the analyst to evaluate decision alternatives for optimum results. Understanding cost of capital, financial structure, risk and uncertainty, present worth, rate of return, and other economic yardsticks enhances the quality and the value of economic analysis. Discussion of real-life examples with participants from many different countries enhances the value of the course.

DESIGNED FOR
Managers, supervisors, and operating personnel concerned with costs, profitability, budgets, the company bottom line and other aspects of economic analysis of petroleum production on a project, corporate, and worldwide basis, who have had some previous experience in this area. Due to similarity in content, PetroSkills recommends that participants take this course if they have some 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, ratios, what is and is not included, reading between the lines • Worldwide business operations: concessions, licenses, production sharing contracts, joint ventures, cost of capital, sources of funding, debt and equity • Performance appraisal: buy/sell assessments • Computer economics software
• Tips on format and inclusion of economic factors in computer spreadsheet analysis • Ethics in economic analyses

2018 Schedule and Tuition (USD)

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<td>$5090+VAT</td>
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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 exercises, while the other half require the application of R&D, risk management, and all capital investment decisions. Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations. Decision tree and influence diagrams provide clear communications and the basis for valuing each alternative. The complementary Monte Carlo simulation technique is experienced in detail in a hands-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 prequisite 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 flexibly design alternatives with decision tree analysis
• Develop and solve decision trees for value of information (VOI) problems

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

Advanced Decision Analysis with Portfolio and Project Modeling – ADA

SPECIALIZED 5-Day

Quality forecasts and evaluations depend upon well-designed project and portfolio models that are based upon clear decision policy, sound professional judgments, and a good decision process. In this course participants learn to build good models. We use the familiar Microsoft Excel spreadsheet as the platform for project and risk assessment models. Add-in software provides Monte Carlo and 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.decisionanalysis.com/adapre-readto review a course prerequisites list and to take a short self-assessment quiz. You may log in 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 OA 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 decision tree analysis); calculating probability and distributions with simulation; modeling and optimizing investment portfolios; valuing added control and flexibility; stopping rules; ways to model correlation • Decision Tree Analysis: value of information review, sensitivity analysis; solving with utility for risk aversion • Decision Policy: portfolio optimization to maximize economic value; efficient frontiers; multi-criteria decision making; valuing and cost drivers; risk policy as a utility function; evaluating the 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

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 petroleum companies’ budgets fluctuate 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
• Delineate and monitor the behavior of costs
• Build your own activity dictionary
• Understand the principles of Activity Based Cost Management (ABC) and its development and implementation
• Analyze capital projects using the proper tools and techniques
• Manage and not mismanage costs
• Develop tools to use for managing costs
• Evaluate costs for effectiveness

COURSE CONTENT
Defining costs; classifications and terminology for an E&P company • Determining cost objects, cost drivers and their behaviors • Analyzing different types of cost management systems • Using Activities Based Management (ABM) to monitor costs and processes Building and using an activity dictionary • Using value added costs versus non value-added costs for improvement • Distinguishing between cost effectiveness and cost 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

2018 Schedule and Tuition (USD)

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<th>Location</th>
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<tr>
<td>HOUSTON, US</td>
<td>10-14 DEC</td>
<td>$4890+VAT</td>
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<tr>
<td>LONDON, UK</td>
<td>15-19 OCT</td>
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Petroskills.com | +1.800.821.5933 (toll free North America)

Any course is available inhouse at your location. Contact us today.
Fundamentals of International Oil and Gas Law – IOG

FOUNDATION 5-Day

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

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

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

CURSE CONTENT
Law governing international petroleum transactions (including significant differences between various national legal systems, and the sources, principles, and limits of international law as applied to petroleum transactions) • Interpretation and enforcement of treaties and private contracts • Effects of international trade (and producing country) agreements such as the E.U., NAFTA, Mercosur, and GPEC • Dispute resolution approaches, including litigation and arbitration • Procedures under and enforcement of common arbitration provisions • Legal defenses available to foreign companies, states, and state-owned or connected entities, and recognition and enforcement of judgments and arbitration awards • Basic legal concepts of ownership of mineral rights (onshore, offshore, and deep sea bed) • Expropriation and compensation issues • State-owned entities and privatization • Laws bearing on development rights • Legal interpretational issues of common contract provisions • Interpretational issues for service contracts • Transfer and protection of technology and intellectual property • Interpretable legal systems and transactions

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 model economic to assess the value of the 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

CURSE 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 • Funding petroleum development • 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
**Contracts and Tenders Fundamentals – SC41**

**FOUNDATION – 3-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN**

- How to better manage project and legal risks with the contracting process
- How to successfully manage disputes and contract performance issues
- What is required in a successful tender package
- How to identify the appropriate contract pricing strategy to minimize financial risks and contract costs
- The difference between cost and price analysis and how to use each technique to evaluate a proposal
- Appropriate commercial and legal contract terms and conditions

**COURSE CONTENT**

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

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**Effective Materials Management – SC42**

**FOUNDATION – 3-Day**

This three-day course covers practical considerations essential to achieve major improvements in planning, buying, storing, and disposing of the vast array of materials and spare parts needed in the oil and gas industry. 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, continuous inventory, and integrated supply agreements
- How inventory systems use forecasting techniques and what can be done to improve them
- How to improve warehousing efficiency, layout, and space utilization for better inventory management
- How to improve inventory record accuracy and physical control of materials to lower inventory levels and increase space utilization
- Best practices used to manage surplus or inactive assets and increase investment recovery dollars

**COURSE CONTENT**

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

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**Inside Procurement in Oil and Gas – SC61**

**INTERMEDIATE – 3-Day**

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

**DESIGNED FOR**

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

**YOU WILL LEARN**

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

**COURSE CONTENT**

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

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

**INTERMEDIATE – 3-Day**

The development and implementation of carefully crafted strategies for the procurement of all goods, equipment, materials, and services has become a critical issue for all those in the oil and gas industry 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, and 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
- Categorize in a purchased materials/services strategic plan outline

**COURSE CONTENT**

Stages to world class supply management • Changes 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 international uncertainties, when, where, and how to use “Economic Price Adjustment” clauses • Internal surveys to improve purchasing performance • Total cost of ownership concepts • Cost containment methods • Cost reductions and cost avoidance • Savings reporting procedure • Developing purchased materials/services strategic plans • Developing the purchase price index for your organization • Negotiation skill sets • Steps in negotiation preparation • Positional negotiations • Final points before the negotiation
Supplier Relationship Management – SC63

INTERMEDIATE  2-Day

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

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

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

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

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 PSQM 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/pricings 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 available as a 5-day in-house course with expanded content.

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

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

COURSE CONTENT
Use of price indexes • Cost/pricing analysis • Total cost of ownership • RFQ/tendering as a price analysis tool • Cost estimating relationships • Purchasing savings impact on the bottom line • Developing the spend profile • Sources of spend data • How to perform the ABC analysis • Examples of using pivot tables in Excel for data mining • Continuous improvement skill sets • Difference between cost and price analysis • Selection tool • Methods of price analysis • Historical analysis • Developing company purchase price • Index 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

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.

DEIGNED FOR
Early career project managers, leads, engineers, and services personnel who are on field development project teams that manage operations and facility reps, cost and schedule controllers, and buyers and logistics specialists.

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

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

Petroleum Project Management: Principles and Practices – PPM

INTERMEDIATE  5-Day

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

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

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

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

Managing Project Controls for Contractors and Owners – PC21
INTERMEDIATE 3-Day
This course addresses project controls principles and practices as they relate to fabrication as well as engineering, procurement, and construction contractors. The focus of the course is using project controls effectively to work with the client, maintain project profitability, make schedule, and deliver a quality and safe project. Upon completion of this course the participant will understand the critical success factors for cost estimating, scheduling, and progress measurement and be able to utilize these best practices to resolve issues and challenges experienced by EPC contractors on their projects. Participants will understand all the steps necessary to develop an effective EPC project controls plan and staff it to increase the likelihood of success. The course focuses on completing contract requirements during the detailed engineering, procurement and construction phases of project development. How to use project controls for effective decision making and client management is also addressed. The course is taught using a combination of 30% instruction and 70% facilitated workshop sessions that address real-world issues and challenges. The workshop sessions include both individual and group activities that will provide each participant with a hands-on application of the principles and practices discussed throughout the course.

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

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

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

2018 Schedule and Tuition (USD)
HOUSTON, US 21-25 MAY $4340
8-12 OCT $4340
LONDON, UK 30 JUL-3 AUG $4340
5-9 NOV $4340

2018 Schedule and Tuition (USD)
2018 Schedule and Tuition (USD)
HOUSTON, US 10-14 SEP $4340
See website for dates and locations

Any course is available inhouse at your location. Contact us today.
Advanced Project Management – FPM62

SPECIALIZED 5-Day

Mega projects are complex. A program composed of these super projects is highly complex. For a very large project, addressing linked issues is key to improving the chances of success. In a sector. This advanced five-day course is suitable for business, commercial, and finance officers. It is recommended that attendees provide a few scenarios from their current or past projects to be used in the workshop as case studies.

DESIGNED FOR
Experienced project 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 also included. The course content is practical and hands-on. The course will cover all the project phases, with hands-on content directly supported by practical case studies.

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

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

Advanced Project Management 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

Essential Leadership Skills for Technical Professionals – OM23

BASIC 5-Day

In the oil and gas industry, skillful and competent leadership is extremely important for safety, productivity, and asset management. The 21st century brings new emphasis on leaders, new communication technologies, increased focus on safety, information overload, workforce dynamics, asset integrity, and many other concerns which challenge even the most proficient leader/manager. How do we blend these new challenges with tried and true wisdom of success? There are skills to learn that will help you be more effective, with less stress. In this seminar/workshop you will explore your internal drivers and learn how to combine them to reduce your stress and increase 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 “psychology 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

Advanced Project Management Workshop – APMW

SPECIALIZED 3-Day NEW

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

DESIGNED FOR
This course is designed for senior project management staff of EPC contractors working on large international projects in the energy industry with a focus on the Middle East Region. It is recommended for experienced project managers, project engineers, project controls managers, construction managers and discipline leads.

YOU WILL LEARN HOW TO
Allocate contract risk between owner and contractor
Address terms and conditions at bidding stage
Handle owner-provided FEED as basis of bid
Finalize terms and conditions before contract signing, contract administration, and records keeping
Understand and negotiate liquidated damages applied to project milestones
Handle change orders, suspension of work by owner or contractor, and contract termination for cause or convenience
Prepare for dispute resolution and claim by contractor
Determine when negotiation, mediation, arbitration, and litigation are necessary
Understand 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
Identify, assess, and mitigate project risks
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

2018 Schedule and Tuition (USD)

See website for dates and locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>Tuition (USD)</th>
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<tbody>
<tr>
<td>HOUSTON, US</td>
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See website for dates and locations

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<th>Tuition (USD)</th>
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<td>ORLANDO, US</td>
<td>3-7 DEC</td>
<td>$1410</td>
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### Essential Technical Writing Skills – ETWS

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

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<thead>
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<th>BASIC</th>
<th>3-Day</th>
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<tr>
<td>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.</td>
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### Team Building for Intact Teams – TB

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

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

### Course Content

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

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

#### Team Building for Intact Teams
- Purpose of teams
- Characteristics of a high performance team
- Gaining clarity of goal and worthiness
- Developing a team charter
- Gaining commitment
- Team collaboration and trust
- Establishing group operational norms
- Working through the stages of team development
- Define team roles and relationships
- Understand system influences
- Promote conditions for effective team building
- Conduct individual and team assessments
- Improve team communications
- Improve group dynamics
- Solve team issues
- Develop a team plan to improve team effectiveness
- Lead when necessary
- Monitor team progress

#### Team Leadership
- Definition and purpose of teams
- Characteristics of a high performance team
- Gaining clarity of goal and worthiness
- Developing a team charter
- Gaining commitment
- Team collaboration and trust
- Establishing group operational norms
- Stages of team development
- Define team roles and relationships
- System influences
- Conditions for effective team building
- Individual and team assessments
- Team communications
- Group dynamics
- Problem solving in teams
- Developing personal plans to improve team effectiveness
- Taking the lead
- Effective team meetings
- Monitoring team progress
Presentation Skills for the Petroleum Industry – PSPI

FOUNDATION 3-Day

One of the prime requisites for oil and gas professionals is to be able to deliver presentations in a clear, concise, and well-designed way as possible. Some industry technical professionals are naturally gifted designer/speaker/presenters, others are not. However, 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. This course is for individuals who are required, as part of their jobs, to deliver presentations in-house or in public, and who wish to perfect the art and craft of dynamic presentation-making in order to do so.

Participants will participate in a full array of hands-on class exercises to improve presentation-making skills, vocal techniques, social interaction skills, visual aid preparation, etc. Attendees will deliver two presentations in class, both of which will be videotaped to measure improvement, and will discuss their performances in one-on-one private conversations with the instructor at the end of the course. Participants’ progress will also be charted to quantifiably show areas in which actual improvement has taken place.

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

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

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

Making Change Happen: People and Process – MCPP

INTERMEDIATE 2-Day

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

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

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

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

Meeting Management and Facilitation for the Petroleum Industry – MMF

FOUNDATION 2-Day

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

Participants will be given ample opportunity to practice what they’re learning in class and to receive feedback about those areas of meeting management and facilitation they do well and those areas that they’ll need to improve.

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

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

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

Managing and Leading Others – MLO

FOUNDATION 3-Day

Why would any company expend hundreds of thousands of dollars to seek, recruit, and hire the best employees then leave their development and performance to lucky chance through ineffective leadership and management practices? Unfortunately, that chance occurs every time an employee is promoted to a leadership, supervisory or management position without training in the techniques and practices of effective leadership and management.

Managers and supervisors, regardless of technical expertise, can make an error setting off an uncontrolled and disastrous chain reaction unless he/she has command of principles and practices leading to employee effectiveness, productivity, and teamwork. The first-line and mid-level supervisor has more direct effect on employees and the productivity of a work group than any other single entity in the organization. This course increases the confidence and productivity of leaders, supervisors and managers who may be scientific or technical specialists, but have minimal training in the science and art of leading others. Skills in human relations, communication, motivation, and leadership are essential tools for the supervisor and manager. This course provides techniques enabling leaders to efficiently use one of the greatest resources a company has, its people. This interactive learning program will assist you in expanding your options for leading others.

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

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

COURSE CONTENT
The role and function of the leader, supervisor, and manager • Understanding and applying essential behavioral management concepts • Understanding and increasing employee motivation • Understanding and applying leadership concepts • Effectively supervising a diverse workforce • Basic skills in interpersonal communications • Performance management • Coaching • Working with difficult employees • Goal setting • Empowering subordinates • Creating positive and functional thinking about work • Making ongoing change for growth and improvement • Taking personal responsibility • Developing personal plans to improve team effectiveness
MR. PETER AIRD has 38 years’ experience as an offshore drilling, well engineering, and operations specialist. He has initially served and trained as a marine engineer officer working for 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 offshore UK deepwater and HPHT wells, and frontier exploration wells in North America, South East Asia (Brunei, Malaysia, and Indonesia), South West of Britain, Norway, Faroese, Greenland, the Black Sea, South Atlantic, Europe Mediterranean, Red Sea, and West Africa. During the last few years, Peter has been further employed as a staff-based senior and specialist drilling engineer in the upstream business with drilling contractor Maersk Oil. He has produced multiple technical and operational treatises on oil well design, construction, engineering, and drilling operations. From 1993 he has also hosted a specialist interactive website at www.kingdomdrilling.co.uk. Peter holds an MSC in Drilling Engineering from The Robert Gordon University which he gained as a mature student.

MR. 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 certification, production economics, and geosteering. In his career, he has applied his geophysical and geological expertise to oil and gas basins throughout the world, including the USA, Canada, Mexico, Argentina, South America, South East Asia, Africa, Australia, Asia, and the Middle East. He has been involved in work for offshore UK deepwater and HPHT, and frontier exploration wells in North America, South East Asia (Brunei, Malaysia, and Indonesia), South West of Britain, Norway, Faroese, Greenland, the Black Sea, South Atlantic, Europe Mediterranean, Red Sea, and West Africa. During the last few years, Peter has been further employed as a staff-based senior and specialist drilling engineer in the upstream business with drilling contractor Maersk Oil. 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.

DR. ASNL 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 (PERET) and in customizing C++ software for reservoir modeling, and has performed field study using an ECLIPSE flow simulator. He is coordinating the following research and consultancy projects: Reservoir Rock Type Modelling, Stochastic Property Modelling, Fracture Integration and History Matching, Fracture Modelling and Integration into Reservoir Simulation. He has published on reservoir characterization, and flow simulation. Further, Dr. Bahar has a PhD in Petroleum Engineering from the University of Tulsa as an MS in Petroleum Engineering. Dr. Bahar received his BS in Mechanical Engineering from the Istanbul Tekniko Enegineering.

MR. STEPHEN ASBURY is the author of six internationally published books on safety and risk management, and a highly experienced HSE practitioner and instructor. He is a Chartered Safety and Health Practitioner (C.S.H.P), a Chartered Marine Engineer, and Chartered Member Emeritus of the American Society of Safety Engineers. Awarded the IOSH instructor (2007-present) on our HSE and management systems. He has over 30 years’ risk management experience gained working in leading organizations, in consultancy, and in the London insurance market, where together, he has worked in over 70 countries on six continents. Stephen is a former member of the IGOSH Council of Management (1998-2013), and three-times chair of its Professional Committee. Outside of PetroSkills, he is a director of AIASS Group Limited, a leading international HSE consulting company. In addition to his books, Stephen is the author of 40 technical papers and articles in international oil and gas journals. He is a former board 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 Industry Advisory Board. He is the author of numerous technical publications, the recipient of several professorships, research, teaching and merit awards and listed in Who's Who in Science and Engineering. He received a Chemical Engineering State Diploma from the National Polytechnic School of Algiers, an MS and a PhD from the University of Tulsa.
Mr. Robert E. Boyd is a registered trainer for National Examining Board for Occupational Safety and Health (NEBOSH), qualified as a health and safety engineer, having a Certificate in Health and Safety (BSc). He has served in various management and project leadership roles, including operations, finance, and HR. His expertise includes HSE and environment, with a focus on the oil and gas industry, where he has spent over 30 years. He is a registered Professional Engineer (P.Eng.) and holds a Master of Science in Engineering (M.Eng.) from the University of Colorado. Currently, he is the Head of Training for Corporate Risk and Compliance at Wood Group, responsible for the company's training programs. Mr. Boyd is a member of the SPE and has served on numerous SPE committees, including the 2012 SPE Best Paper Award Committee.

Mr. Ford Brett is recognized worldwide as a leader in the area of Petroleum Project and Process Management. A registered Professional Engineer (P. Eng.), Mr. Brett has consulted in over 32 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 Venezuela. He has received many honors, including the 2000 Crosby Medal for his work in global competitiveness through quality 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. Mr. Brett has a BS in Chemical Engineering from Stanford University and an MBA from the Wharton School of the University of Pennsylvania. He is a registered Professional Engineer (P. Eng.) and is a Fellow of the SPE. He has also served as an officer and director for the SPE Gulf Coast District's Field Operations Committee.

Mr. Larry K. Britton is an engineering consultant with NSI Fracturing and President of Britt Rock Mechanics Laboratory at the University of Tulsa. Mr. Britton has 37 years of professional experience in the application of rock physics to exploration. His experience with BP included interests in unconventional shale resources, complex salt tectonics, and the application of rock physics to exploration. With BP, he held various positions in unconventional resources, including project management, research, and leadership roles. He has been involved in research and development for companies such as BP, Marathon Oil, and Oryx Energy. Mr. Britton has authored or co-authored over 30 technical publications, and has been granted over 30 US and International patents—indicating several patents related to elimination of Drilling Bit Wear (which the Oil and Gas Journal listed as one of the most significant developments in the history of the petroleum industry). In 1999, the Society of Petroleum Engineers honored him as a Distinguished Lecturer. Mr. Britton served on the SPE International Board of Directors from 2007 to 2010 where he sat on the Directors and Comptroller's Executive Board. Mr. Britton holds a BS in mechanical engineering and physics from Duke University as well as an MS in Engineering from Stanford University and an MBA from Oklahoma State University.

Mr. 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 the area of wide angle seismic. Bob has been a member of the SPE since 1971 and is a Fellow of the SPE. Bob has authored over twenty papers, including a series on Wide Angle Seismic at the 1994 Annual Technical Conference and Exhibition. He is also the President of the Geological Society of America, and was named Distinguished Lecturer by the American Society for Competitiveness for its work in environmental site investigation, geotechnical and geophysical teams. Fiona has a BSc (Hons) in Geology with a major in Geophysics, an MSc in Environmental Monitoring and a qualified TAP trainer.
MR. RICHARD S. CARDEN has taught drilling, horizontal drilling and underbalanced drilling seminars in the United States and internationally for more than 20 years. He has authored numerous technical papers on directional drilling, underbalanced drilling, and drilling fluid systems. He was a contributing author to the textbook 'Underbalanced Drilling Manual' published by GRI. He worked for Grace, Shurman, Moore and Associates (GSM) as a drilling completion consultant both domestically and overseas. While at GSM he was a wellsite consultant drilling and completing wells in the Canadian North, Alaska, and the Middle East. He has over 13 years of experience in downhole pressure wells, air drilled wells, directional wells, and horizontal wells. He also worked as a Drilling and Production Engineer for Marathon Oil Company in the Rocky Mountain region. He earned a BS degree in Petroleum Engineering from Montana College of Mineral Science and Technology in 1977.

DR. ANDREW CHEN has worked with British Petroleum, AEM Petroleum Consultants, Schlumberger and other companies as a reservoir engineer and reservoir engineer and research consultant. He has been responsible for operation reservoir engineering, oil and gas reserve and resource estimates, economic forecast and budgeting, acquisition and disposition, equity financing, and midstream supply studies. He also specializes in wireless system testing (WST) during drilling, well testing, production enhancement andfrac jobs of petroleum engineering and teaching experience. During his tenure with Schlumberger Canada, he was responsible for providing a variety of reservoir engineering and technical services for the Canadian oil and gas industry. He has been responsible for training clients, providing clients with solutions to drilling, production, and field development projects, including training of operators and clients, troubleshooting problems testing, and coordinating land and offshore projects for reservoir description and formation evaluation. Dr. Chen has consulted providing services in many Canadian and international companies, providing technical assistance, preparing reports, 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 OG/G Petroinformatics in the industry worldwide, and frequently provides in-house practical WFT interpretation and application workshops, including his seminar on wireless solution testing for well test wireless testing/diagnostic testing of the Iraqi Petroleum Ministry and the Sheik Suleiman field. He has taught in-house classes and troubleshooting oilfield problems around the world. He has received many SPE awards, and recognitions, including Distinguished Lecturer (2006), Distinguished Member (2013), Distinguished Service Award (2016), and Regional Well Completions Optimization and Technology Achievement Awards (2018). He is the founder and intern for the Society of Petroleum Engineers (SPE) and one of the founders of the Soft-skills Committees. Dr. Cheung has chaired many SPE workshops, conferences and technical sessions. He holds an M.S. in Petroleum Engineering and a Ph.D. in Chemistry from the University of Southern California and the University of Texas at Austin. Since 1990, He received a BS from Marietta College, and an MS from the University of Tulsa, and a PhD in Petroleum Engineering from Heriot-Watt University, Edinburgh, Scotland.

DR. STEVE CHEUNG is the President of StewiCor Consultants, and also 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, and carbonate reservoirs. He has been a lead or key figure in multiple major projects throughout the world. He has taught in-house classes and troubleshooting oilfield problems around the world. He has received many SPE awards and recognitions, including Distinguished Lecturer (2006), Distinguished Member (2013), Distinguished Service Award (2016), and Regional Well Completions Optimization and Technology Achievement Awards (2018). He is the founder and intern for the Society of Petroleum Engineers (SPE) and one of the founders of the Soft-skills Committees. Dr. Cheung has chaired many SPE workshops, conferences and technical sessions. He holds an M.S. in Petroleum Engineering and a Ph.D. in Chemistry from the University of Southern California and the University of Texas at Austin. Since 1990, He received a BS from Marietta College, and an MS from the University of Tulsa, and a PhD in Petroleum Engineering from Heriot-Watt University, Edinburgh, Scotland.

DR. JOHN F. DILLON has over 30 years of industry experience working for major companies such as ConocoPhillips and BP, as well as consulting experience in geoscience, organizational excellence and staff development. He has worked the entire exploration-development disposal chain, from early basin analysis, through development, to end of field life ramp-up. He has experience spanning a wide range of play types, rock types, and environments of deposition and his development experience has taken him to the North Sea, Dubai, West Coast Africa, and Alaska. His exploration efforts have been in Angola, Congo, Libya, Nigeria, and the Western US. He brings experience to the room beyond the science itself, including the management of personnel associated with the science, project development from conception through to high level approval, as well as years of experience in how we get things done and why this is important. He has been deeply involved with the creation and refinement of learning and staff development programs since his time as a Technical Development Manager, Curriculum Development Manager, Division Technical Development Manager, Petroleum Business and Petroleum Professional Development Discipline icon legend on page 60.
gas condensate reservoir engineering, miscible flooding, reservoir simulation, reserve assessment, economic evaluations and field development planning. Mr. Gay-De-Montella is a Chemist and Chemical Engineer with 30+ years of experience. He is skilled in process engineering, commissioning, design in plant operations, teaching and training of professionals and operators, and has been active in the development of new technologies. His experience in water treatment includes both membrane and conventional techniques including membrane processes, physical separation, gas stripping, coagulation, flocculation, paper, food, beverage, and feed chemicals industries and environmental knowledge and experience in Steam Activated Gravity Drainage (SAGD) and Cyclic Steam Stimulation (CSS) extraction of Heavy Oil produced water treatment. His laboratory work has been in steam treatment and water treatment conditions and HT-MEAC mixture injection in wells. He is an expert in water treatment and water treatment both for industrial and for municipal applications. Recently, Rafael has been involved in water treatment of fracking waters and is proficient in using OIL, ROSSA, and other CA modeling tools as well as extensive experience in carbonate reservoir characterization issues, including published extensively on carbonate reservoir characterization issues, including published extensively on carbonate reservoir characterization issues, including 

Dr. Curtis L. Golik is an independent Petroleum Engineering consultant working out of Golden, Colorado. In addition to his consulting business, James Peak, he acts as the Managing Director of two US based oil and gas companies, Peak Associates and Low Capex Reserves. He has 38 years experience working for three global oil and gas companies. His specific contributions include start-up operations, petroleum economics, and introducing new reservoir management technologies internationally. His personal skills are in team development, specifically international cross cultural project teams of industry professionals. He has been an instructor for the University of Texas and Colorado. He received a Bachelor’s Degree in Petroleum Engineering from Colorado School of Mines, and an Executive MBA from UCLA Business School.

Mr. Mason Gomez is the PetroSkills Technical Director for the Production and Completions discipline and the Reservoir Engineering director for the reservoir management team. He is experienced in all aspects of people management especially mentoring, negotiating, personnel management, organizational development, change management, commercial techniques and economic planning. He received a Bachelor’s Degree in Petroleum Engineering from Stanford University.

Mr. Eric A. Foster is a Geoscience Technical Advisor with PetroSkills-GSCI based in Houston. He has 40 years of operations and management experience in the Oil and Gas Industry. Eric was with Schlumberger for over 25 years. He was with Landmark and responsible for managing geoscience and engineering consultants, representing geological, geophysical, and petrophysical software applications and services for global operations. Starting at Schlumberger in field operations in the US, he then moved to 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. His teaching experience includes courses in wells image theory and applications, and wells borehole interpretation at Colorado School of Mines, Stanford University and Rice University. He has authored over 25 technical papers on computer data formats (LAS) and has compiled numerous technical papers and training materials; he is a certified tutor for online learning.

Mr. Laura S. Foulk has over 25 years of business, customer service, geology, interpretation, engineering, management, and sales experience. In addition, she has held a number of related roles including 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 wells image theory and applications, and wells borehole interpretation at Colorado School of Mines, Stanford University and Rice University. She has authored over 25 technical papers on computer data formats (LAS) and has compiled numerous technical papers and training materials; she is a certified tutor for online learning.

Mr. Martyn Grant is an experienced health, safety and environment subject matter expert with a history of military service in both the Royal Marines and Royal Electrical Mechanical Engineers. During his service, he was promoted to Warrant Officer Class 1 and then received the Queen's commission, retiring as a Major. On leaving the military, he worked for two police forces as their Health, Safety and Environment Manager. Since 2013, he has been Head of Distance Learning at Corporate Risk Systems Limited. Martyn is a Chartered Fellow of the Institute of Occupational Safety and Health (CFOSH), a member of the Institute of Risk Management, a Fellow of the Institute of Environmental Management and Assessment (FIMEA) and a member of the Institute of Environmental Management and Assessment (AIMEA). He is experienced in all aspects of people management especially mentoring, training, design, development and delivery.

Mr. Tom J.T. Grimes is an Instructor/Coach for Shell’s introductory course for graduates. He teaches Geology, Geophysics, Petrophysics and some aspects of Reservoir Engineering. His Shell career spanned 25 years in Petrophysics, Reservoir Engineering, Rock Mechanics, etc. Tom has over 2500 hours of experience teaching and coaching. He is skilled in negotiating, personnel management, organizational development, change management, commercial techniques and economic planning. He received a certification and PhD in Physics from the University of Amsterdam.
MR. MARK HACKLER has over thirty years’ experience in the engineering and energy business for both majors and independents. His areas of expertise include production engineering, enhanced recovery, reservoir simulation, process optimization, formation damage, and other related technical issues. He is a member of the Society of Petroleum Engineers (SPE), a registered professional engineer in Texas, and a member of the American Association of Petroleum Geologists (AAPG). He has over twenty years of experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently a Senior Engineering Consultant with PetroSkills, providing technical support and training to clients. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)

MR. RON HINN is the EVP for Sales and Member Engagement for PetroSkills. He is a people-oriented manager, possessing strong leadership, and has extensive experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently the President and CEO of PetroSkills, a company that provides training and consulting services to the oil and gas industry. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)

MR. AARON HORN is the founder of Eos Resources, a training company aimed at providing leadership and technical training to multiple industries. He currently serves as Executive Vice President of Operations at Foundation Oil Services, where he leads operations for water treatment and drilling fluid systems, and is involved in the acquisition of other businesses. He has over 15 years of experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is a resident of Houston, Texas. (photo)

MR. TIMOTHY L. HOWER is President of Maitland Huen Associates, Inc. (MHA) a Denver based petroleum consulting firm. Mr. Hower has over 20 years of experience in the oil and gas industry, and has authored numerous publications on oil and gas reservoir engineering. He has over 15 years of experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently the President and CEO of PetroSkills, a company that provides training and consulting services to the oil and gas industry. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)

MR. WILLIAM E. HUGHES is a petroleum engineer with over 25 years of experience in the oil and gas industry. He has extensive experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently the President and CEO of PetroSkills, a company that provides training and consulting services to the oil and gas industry. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)

MR. SATISH K. KALRA is a petroleum engineer with over 25 years of experience in the oil and gas industry. He has extensive experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently the President and CEO of PetroSkills, a company that provides training and consulting services to the oil and gas industry. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)

MR. JOHN KEASBERRY is an exploration geologist and partner at J&M GeoScience Services. In a 30-year career he worked as an expert witness in California, Texas, Louisiana, New Mexico, and the Gulf of Mexico for both investors and oil companies. He has published numerous papers and other works about geology and exploration. He is a member of the American Association of Petroleum Geologists and the Society of Petroleum Engineers. He is a resident of Houston, Texas. (photo)

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 for Colombo Pride Oil and Gas in the Middle East, and has worked for a number of international oil and gas companies. He has over 15 years of experience with Amerada Hess starting as a petroleum engineer and progressing to Acting General Manager of its North Sea Operations Base. He received a BEng (Honours) degree in Electronic Engineering from the University of Sheffield and speaks Norwegian and French. (photo)

MR. RICHARD HENRY has over thirty years’ experience in the engineering and energy business for both majors and independents. His areas of expertise include production engineering, enhanced recovery, reservoir simulation, process optimization, formation damage, and other related technical issues. He is a member of the Society of Petroleum Engineers (SPE), a registered professional engineer in Texas, and a member of the American Association of Petroleum Geologists (AAPG). He has over twenty years of experience in the oil and gas industry, working in various capacities for major and independent oil companies. He is currently a Senior Engineering Consultant with PetroSkills, providing technical support and training to clients. In addition to his work with PetroSkills, he is a frequent speaker at industry conferences and events. He is a resident of Houston, Texas. (photo)
Our Instructors

**DR. MOHAN G. KELKAR** is a professor of petroleum engineering at the University of Tulsa in Tulsa, Oklahoma. His main research interests include pressure buildup analysis and characterization of carbonate and tight sandstone formations. He has been involved in several research projects, which are partially funded by various national and international oil companies, the US Department of Energy, and the Oklahoma Center for Advanced Science and Technology. He has large-scale reservoir simulation projects in Canada, Indonesia, Singapore, Nigeria, Kuwait, Abu Dhabi, Scotland, India, and Denmark 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 Oklahoma, and a J.D. from the University of Tulsa.

**MR. BILL KEMP** has 40 years of oil and gas industry experience in engineering, operations, production development, commercialization, business development, sales, and marketing. He is currently Strategic Account Manager with PetroSkills, having joined in 2013. Bill is responsible for developing and delivering strategic projects, training and software solutions in the upstream, midstream and downstream segments. Previously, Bill was manager, sales and marketing, for the Dilliette Technology Group in Hexon in Houston, beginning in 2004. At Hexon 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 has numerous field engineering, sales, marketing and business development positions at Halliburton. As global marketing manager for stimulation in the late 1990s, Bill led the development and growth of the company’s fracturing technologies. He left Halliburton in 2000 to start a consulting company specializing in oilfield market research and technology commercialization. Bill has been active in SPE and served numerous roles at both the local and national level. Bill has a BSSE from the University of Texas at Austin.

**MR. SIMON KETTLE** is an Earth Science and Geoscience professional with over 35 years’ experience in GIS Remote Sensing, Geology and Sedimentology. Simon has been with Esri for 2 years and is currently a GIS consultant and trainer. Simon specializes in delivering on-site technical GIS consultancy to many of Esri’s key clients around the world. A qualified TAP trainer for the Esri GIS Geoscientists, Geologists and Environment Scientists, Simon has a BSc in Geology and Geography, and an MBA in Carbonele Sedimentology.

**MR. AARON L. KLEIN** is based in Houston, Texas, and is the Vice President of Operations at PetEX International, Inc. His training credentials with PetEX include Leadership and Performance Skills Workshops, RigSMARTS President of Operations at PetrEX International, Inc. His training credentials with

**DR. LARRY W. LAKE** is a professor and Interim Chair in the Department of Petroleum and Geosciences Engineering at The University of Tulsa. He is a member of the faculty at Austin College in Texas focusing on petroleum and geosciences. He is a petroleum engineer with experience in production 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 for 22 years in various positions. In 1997, formerly he held the Shell Distinguished Chair and the W.A. (Tux) Moncrier, Jr. Centennial Endowed Chair in Petroleum Engineering. Currently, he holds the W.A. (Monty) Moncrier Centennial Chair in Petroleum Engineering.

**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, artificial liftings, production optimization and development planning. He has done technical training courses and workshops on the topic. For his contributions to the safety profession, he received the Edgar Monsanto Queeny Safety Professional of the Year award in 2016.

**MR. THOM KRAMER** is a safety consultant and structural engineer with more than 40 years of experience in the oil and gas industry. He is a certified professional safety engineer, he has spent much of his career consulting with clients to reduce risk for workers at heights. He specializes in the assessment and design of fall protection systems, as well as fall protection program development. Mr. Kramer is Vice Chair of the ANSI 230 Committee and chairs two subcommittees: ANSI 230.2 which focuses on supports for personnel, and ANSI 230.8, the American National Standards Institute for Fall Protection. He is widely considered as a thought leader in the fall protection industry, having given more than 100 technical sessions and workshops on the topic. For his contributions to the safety profession, he received the Edgar Moncarro Safty Professional of the Year award in 2016.

**MR. JOHN LOGEL** is a Geophysical Consultant to various oil and gas companies. John recently held positions as Chief Geoscientist North Sea for Talisman Energy Norge/Nor 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 positions with Eastman Chemical, various positions at Petro-Canada and numerous assignments in Europe and North America. John has over 30 years of experience in the industry, and has worked on the discovery, development and production of several giant, world-class oil and gas fields throughout the world. John has contributed to the development and optimization of reservoir 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 enthusiasm 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 various committees. He has served as chair for the CSEG Fellows Committee, editorial board member of The Leading Edge, and a member of the Board of Directors (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.

**MR. DIEGO LONDONO** is a Petroleum Engineer with 15+ years of experience in rigorous well interventions acquired while working with major international operators around the world. Diego is a well-rounded professional with comprehensive experience includes coiled tubing interventions, stimulation operations, slick-line/towed line electric line interventions, hydraulic fracturing and production testing. Mr. Londono started his career working for Halliburton as a Simulation and Coiled Tubing Field Engineer, then for BP as Well Interventions Engineer/Company Man in rigorous well interventions. He worked for ENI in the giant Khashagosh offshore project in the Caspian Sea as Coiled Tubing/Well Intervention Engineer, then for BP as Equinor Copper Canyon's reservoir team lead. He has more than two years of experience in the offshore fields of Qatar, Abu Dhabi, Qatar and Argentina. His expertise includes technical training within TOTAL and ELF in Petroleum Engineering, in particular focusing on well data acquisition to better serve a field (r)development plan, and reduced life cycle cost. He has also generated collaboration projects in this area between TOTAL and ENI for several years. He has held various international positions overseas in Petroleum and Reservoir Engineering. With ELF from 1990, he delivered internally the first Logging Operations Manual for witnesses; he developed and instructed the training course, dedicated to wellsite geologists and petroleum engineers, in planning and executing operations of LWD and wireline logging, along with the associated QC. From 1974 to 1979, he was a field engineer and field service manager with Schlumberger in various countries of Africa and Middle East. Mr. Louis has authored numerous presentations and publications at SPE ATCE, ATW, and EAGE Conferences. He received a Master of Sciences from ECAM Engineering School, Lyon, France in 1973 and a Degree from IFP in 1979 (School of Applied Sciences in Petroleum Engineering, oil chemistry, geology). He also completed the French Management Studies Degree in Management from the University of Paris II in 1978.

**MR. ALAIN LOUIS** is a Senior Geoscientist and Petroleum Engineer with more than 40 years international experience, both in oil and service companies. He is a foreign-trained field geologist with knowledge of the Niger Delta (Oilfield), reservoir and well performance, formation evaluation, reservoir characterization, along with the associated R&D activities. His recent contributions have led to the design and numerous implementations of collaborative tools of field performance monitoring and optimization (reservoir, facility and tubing) for BP in the Gulf of Mexico, Abu Dhabi, Qatar, Oman, Gabon, Congo, Qatar, Argentina and others. His expertise includes technical training within TOTAL and ELF in Petroleum Engineering, in particular focusing on well data acquisition to better serve a field (r)development plan, and reduced life cycle cost. He has also generated collaboration projects in this area between TOTAL and ENI for several years. He has held various international positions overseas in Petroleum and Reservoir Engineering. With ELF from 1990, he delivered internally the first Logging Operations Manual for witnesses; he developed and instructed the training course, dedicated to wellsite geologists and petroleum engineers, in planning and executing operations of LWD and wireline logging, along with the associated QC. From 1974 to 1979, he was a field engineer and field service manager with Schlumberger in various countries of Africa and Middle East. Mr. Louis has authored numerous presentations and publications at SPE ATCE, ATW, and EAGE Conferences. He received a Master of Sciences from ECAM Engineering School, Lyon, France in 1973 and a Degree from IFP in 1979 (School of Applied Sciences in Petroleum Engineering, oil chemistry, geology). He also completed the French Management Studies Degree in Management from the University of Paris II in 1978.

**MR. PERRY LOVELACE** is CPRM specializes in Maintenance and Project Management, Leadership and Competency-based Training and has over 25 years’ experience in industry training and consulting. His work in competency-based workforce development is known worldwide. In addition to technical competencies, he has led the design and implementation of team-building workshops for hundreds of supervisors and team leaders. He has dedicated his career to providing high quality learning experiences, keeping in tune with the changing economic and technological environments, especially as applied to long-term engagements. His team-based organization and training facilitate organizations through on-site consultation and training. Clients include industrial and utility organizations of different types and sizes around the world.

A certified Maintenance and Reliability Professional (CPRM) by the Society for Maintenance and Reliability Professionals and a member of the Society of Performance and Learning Organization (SPLA), Perry received a BS in Plant Sciences from the University of Oklahoma, with pre-doctoral studies in Plant Ecology at the University of California.
MR. PETE LUAN has over 25 years of international upstream project management experience. He has also consulted for the past 10 years helping early stage companies develop their business plans. Pete has 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 capability. Pete's unique blend of technical expertise and project management experience allows him to effectively communicate and work directly with all levels of project teams to facilitate the implementation of best practices. Later he will 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, system requirements definition and more in the last 20 years.

MR. JOHN MARTINEZ has 38 years’ experience in oilfield production technology with a specialty in facility revision and artificial lift operations, with extensive experience in gas lift. For 27 years he has been the Production Consultant for Production Associates and previously was President of SEG-PA and APG-PA. He has been involved in the design and field implementation of numerous IOCs and NOCs and multinational oil and gas service providers worldwide. His expertise has involved working with projects and operations teams and leading international management teams with diverse cultural backgrounds working in different contracting environments. Mr. Martinez has BS in Physical Metallurgy from the Material Science and Engineering Dept. of Washington State University.

MR. JOHN MCKINZIE is a petroleum consultant from Sugar Land, Texas. His prior industry experience includes 21 years with Texas, Inc. and Getty Oil Company in numerous areas of production and completions including: 1) Waterflooding, water shut-off, cased hole completed horizontal gas wells, high rate horizontal gas wells and deepwater offshore exploration wells. 2) Governmental/state regulations; 3) Well placement, water injection, water shut-off, HP/HT depletion, completions in separation safety, cavity pumps, formation damage, water shutoff, drag reduction techniques for fluid flow, well stimulation and all other pertinent data to create the best assurance. He received his BS and MS degrees in Mechanical Engineering from the University of Texas at Austin. He is a registered professional engineer in the State of Texas.

MR. DAVID MCCGEE has worked in the many of the world’s shelf and deepwater projects for 32 years on projects including exploration through development. He is experienced in all phases of clastic play 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 Neogene, Miocene and Pliocene across many basins, including the Gulf of Mexico, deepwater Angola, sub-salt basins, and regional geologists. Mr. McGee is experienced in the application of technology to problems for maximum benefit including: 1) seismic stratigraphy, 2) Landmark, Satalmage, GeoProbe, VoisGeo, ImapSpark, GeoFerc, Petrel and Shell seismic workflows and data integration; 3) 3D software for conceptual exploration and development projects; 4) acoustic impedance inversion for reservoir-scale architecture and well prediction; 4) structural reconstruction software for fault geometry and trap analysis; 5) gravity modeling, 6) Earthvision, Roxar, Petrel and IHS 3D, and 7) risk management of complex development projects; 8) AAPG's Computerized Well Log Library and 9) various other reservoir models for deepwater fields/discoveries; 7) ArcGIS tools for mapping and data integration; and 8) decision analysis techniques to determine optimum minibasin scale exploration development strategies and well planning decisions. He is experienced in working on integrated teams of geoscientists, geophysicists and engineers that were empowered to make decisions and were accountable for results. He serves as team lead 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 AAPG, Texas AAPG, and the AAPG's AAPG symposiums. Dr. Howard Mckinzie is also a member of AAPG, SEG and SPE, and is the regional manager for Petroskills.

MR. LEWIS A. MCMURRY is a petroleum consultant from Sugar Land, Texas. He holds a BS in Geology from the University of Texas at Austin. Mr. MCMURRY is also a certified Petroleum Geologist with 40 years of experience in the oil, gas, LNG, and petrochemical industry. He has expertise developing and implementing technology for multi-scale and project management. He has major roles opening and growing successful operations in several countries. His experience includes heading the implementation and enforcement of company-wide corporate policies and procedures in all areas including, HSSEQ guidelines and working with local subsidiaries to oversee and control operations of business development budgets and sales forecasts, which resulted in an increase in the number of contracts awarded and a positive impact on the company's bottom line. Mr. MCMURRY is a member of the Society of Petroleum Engineers, American Association of Petroleum Geologists, and the American Geological Institute. He is a member of the American Association of Petroleum Geologists (AAPG).
DR. TIMOTHY MCAHON is the founder and Principal Geoscientist with Callan Consultants, LLC, a Kaly-based prospecting and production 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, Sarawak), the Arabian Peninsula (UAE), and South America (Brazil, Argentina, 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 expertise in seismic interpretation and play analysis, experience in 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 the University of Texas at Austin, his MS in Geology from Kansas State University, and his BA in Geology from Rutgers University.

MR. JEFFREY S. MCMULLAN has over 30 years of broad career experience in the upstream oil and gas business and gas business including engineering assignments in drilling, well completions and production as well as operations supervisory, management and executive positions. He has also worked in employee selection, training and development for technical, administrative and operations personnel and is experienced in building highly successful organizations from the ground up. Jeff received a BS in Petroleum Engineering from Louisiana State University.

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 has worked on various research and engineering projects including the use of both seismic and surface data to identify, evaluate and select targets for drilling, Oil and Gas Well Engineering. Over the years Steve has covered a wide variety of projects, including some of the many semi-vertical wells drilled in the Permian Basin and offshore. Steve also has extensive experience in the areas of Geochemistry, Drilling, Well completion and Production. Steve is a member of the Society of Petroleum Engineers (SPE) and considered an industry expert in the area of Geochemical and Geophysical well completions. He has an MS degree in Geology from the University of Texas at Austin.

MR. K. C. MORENO was a Senior Instructor with Halliburton Baroid Fluid Services. As a Chemical Engineer he has been involved in a variety of different projects including: Engineering, Operations, Research, and Management. With Halliburton, he was a Fluid Technology Development Engineer for 15 years managing the Engineering and Development of new mud products. After being a Schlumberger Mud Logging operator in Southern Argentina, he was a Core Analyst and built with Core Laboratories International - and using CoreLab equipment - the first complete core laboratory in the city of Bogot, Colombia. He developed better analytical techniques for porosity and semipermeable 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 a Product Manager for Halliburton and then Engineering Manager for Halliburton in Malaysia. Mr. Moreno received his BS degree in Chemical Engineering from the University of Buenos Aires, Argentina.

MR. JAMES D. MORSÉ is an applied structural geologist and President of Computational Geologic, 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 thrusts is often fair or poor, making the use of dip data and modern methods of structural geology particularly space-saving and high-quality in field mapping. In 1988 he joined Amoco’s surface in Sedimentary geology, programs which documented the dip-domain character of faults in the Thrust Belt, providing valuable geometric constraints on subsurface maps. By part taking in teaching Amoco Driven’s structural field seminars, Morse helped other geologists apply structural principles in their mapping. After leaving Amoco, he worked for four years with the Shell Development Company in Houston performing structural geology research. In 1995, he joined the faculty of the University of Oklahoma, and a research professor at Colorado School of Mines. He received his BS degree in chemical engineering at the University of Buenos Aires, Argentina.

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 production monitoring. In 1988 he joined Amoco’s surface in Sedimentary geology, programs which documented the dip-domain character of faults in the Thrust Belt, providing valuable geometric constraints on subsurface maps. By part taking in teaching Amoco Driven’s structural field seminars, Morse helped other geologists apply structural principles in their mapping. After leaving Amoco, he worked for four years with the Shell Development Company in Houston performing structural geology research. In 1995, he joined the faculty of the University of Oklahoma, and a research professor at Colorado School of Mines. He received his BS degree in chemical engineering at the University of Buenos Aires, Argentina.

MR. RONNIE NORVELL is a completion consultant from Houston, Texas. He has twenty-two years of well construction experience, having managed deepwater completion projects through design, planning, and execution phases in the Gulf of Mexico, SE Asia, West Africa, and Australia. He is also proficient in the design and execution of sand face and intelligent completions. Patrick has designed and executed workovers and interventions in deepwater for both subsa and platform wells. Patrick earned Bachelor of Science and Master of Education degrees from Louisiana State University.

MR. PATRICK MORAN is a completion consultant from Houston, Texas. He has twenty-two years of well construction experience, having managed deepwater completion projects through design, planning, and execution phases in the Gulf of Mexico, SE Asia, West Africa, and Australia. He is also proficient in the design and execution of sand face and intelligent completions. Patrick has designed and executed workovers and interventions in deepwater for both subsa and platform wells. Patrick earned Bachelor of Science and Master of Education degrees from Louisiana State University.

MR. HECTOR C. MORENO was a Senior Instructor with Halliburton Baroid Fluid Services. As a Chemical Engineer he has been involved in a variety of different projects including: Engineering, Operations, Research, and Management. With Halliburton, he was a Fluid Technology Development Engineer for 15 years managing the Engineering and Development of new mud products. After being a Schlumberger Mud Logging operator in Southern Argentina, he was a Core Analyst and built with Core Laboratories International - and using CoreLab equipment - the first complete core laboratory in the city of Bogot, Colombia. He developed better analytical techniques for porosity and semipermeable 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 a Product Manager for Halliburton and then Engineering Manager for Halliburton in Malaysia. Mr. Moreno received his BS degree in Chemical Engineering from the University of Buenos Aires, Argentina.

MR. JAMES D. MORSÉ is an applied structural geologist and President of Computational Geologic, 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 thrusts is often fair or poor, making the use of dip data and modern methods of structural geology particularly space-saving and high-quality in field mapping. In 1988 he joined Amoco’s surface in Sedimentary geology, programs which documented the dip-domain character of faults in the Thrust Belt, providing valuable geometric constraints on subsurface maps. By part taking in teaching Amoco Driven’s structural field seminars, Morse helped other geologists apply structural principles in their mapping. After leaving Amoco, he worked for four years with the Shell Development Company in Houston performing structural geology research. In 1995, he joined the faculty of the University of Oklahoma, and a research professor at Colorado School of Mines. He received his BS degree in chemical engineering at the University of Buenos Aires, Argentina.

MR. K. C. MORENO was a Senior Instructor with Halliburton Baroid Fluid Services. As a Chemical Engineer he has been involved in a variety of different projects including: Engineering, Operations, Research, and Management. With Halliburton, he was a Fluid Technology Development Engineer for 15 years managing the Engineering and Development of new mud products. After being a Schlumberger Mud Logging operator in Southern Argentina, he was a Core Analyst and built with Core Laboratories International - and using CoreLab equipment - the first complete core laboratory in the city of Bogot, Colombia. He developed better analytical techniques for porosity and semipermeable 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 a Product Manager for Halliburton and then Engineering Manager for Halliburton in Malaysia. Mr. Moreno received his BS degree in Chemical Engineering from the University of Buenos Aires, Argentina.
Prior to joining Saudi Aramco in 1998, Ronnie Norvell was the President and Managing Partner of Management Paradigms, a U.S. based consulting firm dedicated to the management of research, training, IT, and professional services. In this role, he managed the overall strategy and direction of the company. For over 30 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 several boards of directors, the board of directors for Texaco in 1997 for his contributions to the profession by awarding him 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 1992.

## DR. PHIL NOTZ

is an oilfield consultant for flow assurance issues. He worked as a chemical engineer for DuPont from 1968 to 1971, a professional engineer in Texas, and a 25-year member of SPE. He received a B.S. in Chemical Engineering from the University of Missouri.

## MR. WILLIAM K. OTT

is an independent consultant and is the founder of Well Completion Technology, an international engineering company that consults for the oil and gas industry. He has over 30 years of experience in drilling, research, 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.

## 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 being recognized as an expert in corrosion control and management, 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 several years in the NACE Corrosion and other courses, has been responsible for 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 U.S. Patent # 5,942,200 for a Downtowel Chemical Disperser 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.

## 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 advice and technical advice. He integrated geological and geophysical data into predictive, comprehensive basin models for hydrocarbon exploration on 5 continents. He designed and implemented geologically targeted 3D/2D seismic acquisition, processing, and interpretation for field development in South East Asia, Middle East, South America, the UK, Eastern Europe, and Western Europe. 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.

## MR. WILLIAM (BILL) E. POWELL

is an oil and gas professional with over 30 years of experience in field operations, technical sales, marketing, client relations, and management with autonomous operations and profit and loss responsibilities. He has experience in preparing and conducting schools and workshops, world-wide drilling fluid seminars and rig site consultation. Throughout his last 25 years with Exxon, he delivered annual lectures at its house Drilling Engineering Schools on various topics. Since retiring from Exxon in 2003 he has continued to work with the SPE, AIP, AACE, IADC, and consulting on drilling activities. He has received 34 US patents, 23 international patents, the 1981 IADC Special Recognition Award, the 1986 SPE Drilling Engineering Award, several Exxon Legacy of Honor Awards, and the 2006 AIP RP 13C Legacy of Honor Award, the 2006 AIP Service Award, in 2006 was inducted into the AIAE Hall of Fame, in Sept, 2008, one of the first five recognized by SPE as a Drilling Legend. Currently, he is a consultant, Chairman of the IADC Educational and Technical Publications Committee writing theıyor 1st edition of book Drilling, Chairman of the AIP RP 13C Technical Committee, an AIP RP 13C, member of the AIP RP 13B groups addressing issues with drilling fluids and hydraulics, and on the ADE Conference planning committee. He was discharged from the U.S. Army in 1946, received a BS and a MS in Physics from Clemson University, and a PhD in Physics from the University of Missouri.

## DR. DEVLYN ROBSON

is a Geomorphologist with 9 years of research experience in GIS, spatial modeling and spatial statistics. She currently works for Exprodat, providing GIS-based software training for the petroleum industry. Devlyn specializes in the use of spatial statistics for the prediction and classification of geohazards using GIs. A qualified TAP trainer,
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 Management, Global Training and Technology. Previously, he worked for 12 years in the upstream oil and gas industry, with a focus on reservoir engineering, exploration, production, research and corporate development. He specializes in reservoir management, production optimization, drilling, operations, completion and workover capabilities, petroleum development, communications and multi-discipline team building. His professional experience includes: 9 years at Shell Oil as President with Shell Oil, 5 years as 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 Halliburton Energy Services. He is a member of the Petroleum Engineers Conference and in various phases of petroleum engineering and personnel management. He is a member of API, SPE, IPA and TIPRO, is a Tau Beta Pi Fellow, and has an outstanding undergraduate education. He received an MS in Engineering Sciences and an MS in Petroleum Engineering from the University of Texas at Austin.

MR. JOHN SCHUYLER, CAM, CEE, CMA, CMC, CPM, PMP and PE, is a decision analyst, evaluation engineer, and investor. He founded his consulting practice, Decision Precision, in 1988. He has over 30 years of experience in analysis, consulting, training and management, primarily in the energy industry. His focus has been in feasibility analysis, appraisal, corporate strategy, and capacity planning. He has presented over 200 courses in the United States and ten 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 manager of an independent reservoir management and consulting service in the San Francisco Bay area, and chairman of a small consulting firm specializing in geophysical and geochemical studies. 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 Engineering, 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 valore inc.

MR. JOHN C. SCRUTON-WILSON is a founding faculty member of the BP Financial University responsible for developing and delivering finance and economic evaluation training throughout the BP group. He is currently a senior advisor in the BP Americas business unit. He has a consistent focus on oil and gas projects. He has over 30 years of experience in the oil and gas industry. Mr. Scruton-Wilson is a member of SPE, SAPEX and SCA. He is a past SPE Distinguished Lecturer and has delivered finance and economic evaluation training throughout the BP Americas business unit. He has a consistent focus on oil and gas projects.

MR. 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 Monongalia. He has also managed reservoir engineering studies and reservoir evaluations for gas shales and conventional gas 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 the state of Colorado. He is a member of SPE, SPEE, and CIM. He received a PhD in Mechanical Engineering from the University of Colorado.

MR. SUBHASH N. SHAH is the Stephenson Chair Professor and Director of the Well Construction Technology Center at the Mohawk School of Petroleum and Geophysical Engineering at the University of Oklahoma in Tulsa. Dr. Shah has 38 years of experience in the oil and gas industry. He has more than 35 years' experience in reservoir engineering, discipline icon legend on page 60

MR. DONALD (DON) D. SCHMIDT was directly involved with drilling fluids research and supervised research in all aspects of drilling technology during his 30-year career working for Amoco Production Company and its predecessor companies. He holds a B.S. in geology and a B.S. in petroleum engineering from the University of Kansas. He is a member of the SPE, PESA, API, and SEAPEX. He has been an SPDE Distinguished Lecturer, and delivered several courses and workshop sessions on the fundamentals of drilling fluids 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 evaluation. His international oil and gas knowledge was developed through extended assignments in South America, Asia, the North Sea and the USA. He is a member of both 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.

MR. ROD SIDDH is a Senior Applications Engineer with PB from 1992 to 2006. He has been with PetroSkills since 2006 and has over 35 years experience in reservoir engineering, discipline icon legend on page 60

Mr. and Mrs. SHARON SMITH is a GIS professional with over 30 years' experience in GIS and Exploration Mapping. With vast experience in GIS data management and business intelligence, they have created and implemented systems used worldwide to integrate engineering and geological data, he has worked in various management positions as a reservoir engineer, and taught GIS data management. He has authored more than a dozen papers on spatial data and visualization, and has been an instructor for various geoscience courses and workshops. Since 1997, he has been a GIS specialist at the University of Texas at Austin, where he conducts research on GIS applications in the energy industry. His focus has been in feasibility analysis, appraisals, corporate strategy, and capacity planning. He has presented over 200 courses in the United States and ten 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 manager of an independent reservoir management and consulting service in the San Francisco Bay area, and chairman of a small consulting firm specializing in geophysical and geochemical studies. 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 Engineering, 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 valore inc.

Our Instructors
he practiced application of rock and soil mechanics in different areas of geotechnical engineering for about 7 years in various consulting and academic positions. He is a prominent geotechnical engineer who has taught several geotechnical-related and reservoir engineering courses at various universities including University of Saskatchewan. He is a registered professional engineer with APEGSA and has co-authored several technical papers and articles.

**DR. CARL H. SONDERGELD** is Professor and Curtis Muebmeaux Chair, Muebmeaux 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 Modeling Software and Unfrock Modeling Software. He has published over 57 papers on various subjects and he is principal 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.

**DR. JOHN P. SPIVIE** 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 Dwellight EnergyData) developing petroleum economics and engineering software. In 1990, he joined S.A. Holditch & Associates (SAHA), which was purchased by Schlumberger (SLB) in 1997. While at SAHA/SLB he conducted reservoir simulation, gas storage, and tight gas application studies and taught industry short courses in well testing and production analysis. He actively participated in on-going development of the Petrohawk PetroPhysics Software at SAHA/SLB. He is an author or co-author of many papers presented at SPE/IADC conferences and several articles published in journals. He has written many technical articles on reservoir engineering and has authored a book on reservoir engineering for SPE. He is regular contributor to SPE publications and is an associate editor of SPE Journal.

**MR. MARCUS (MARC) A. SUMMERS** has over 30 years of oilfield experience and over 15 years of hands on training experience. He founded and ran PetEX International, Inc., and is currently Discipline Manager of Well Construction/Drilling and a Sr. Instructor with PetSkills. In 1980, he began working as a drilling engineer for Amoco for fifteen years in various locations around the world. His background includes operations, technical support, and drilling research functions. Since 1984 he has written a number of papers presented at SPE/AIME conferences and several articles published in Petroleum Engineer International, American Oil and Gas Reporter, etc. He received a B.S. in Petroleum Engineering from the University of Oklahoma and is a Registered Professional Engineer in Oklahoma.

**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. He has been responsible for exploration and generation of prospects for drilling as well as the management and coordination of operations, technical support, and drilling research functions. Since 1988 he has written a number of papers presented at SPE/AIME conferences and several articles published in Petroleum Engineer International, American Oil and Gas Reporter, etc. He received a B.S. in Petroleum Engineering from the University of Oklahoma and is a Registered Professional Engineer in Oklahoma.

**MR. DAVID TENNOOR** (PCH) has been teaching and teaching Assistant Professor of Operations Management at various universities since 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 wealth of practical experience to the classroom in a variety of positions in Inventory Control, Manufacturing Management, Strategic Sourcing and Transportation/Distribution 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 Georgia Institute of Technology. He is a member of the Houston Chapter of APICS and served two terms on the Board of Directors as Treasurer.

**DR. LAWRENCE W. TEUFEL** is a consultant focusing on naturally fractured reservoirs and petroleum-related rock mechanics projects. He was the fourth President of the American Geophysical Union (1996–2000) and serves on the Advisory Board of the University of Oklahoma’s Geological Engineering Chair at the New Mexico Institute of Mining and Technology until he retired in 2011. He had a 20-year tenure at Sandia National Laboratories, where he was the principal investigator of several cooperative U.S. Department of Energy/ National Nuclear Security Administration projects in tight-gas reservoirs; geologic characterization and fluid-flow simulation of naturally fractured reservoirs, and petroleum-related rock-mechanics studies on reservoir compaction and subsidence. He is an author of over 80 publications. He has received awards from the US National Committee for Rock Mechanics (1998). He is a member of the American Association of Petroleum Geologists and the Society of Petroleum Engineers. He received a BS degree in geology from Syracuse University, an MS degree in geology from Texas A&M University, and a PhD in geology from Texas A&M University.

**DR. ESTES C. (EC) THOMAS** served Shell Oil Company in various management and technical capacities, including as a Petroleum Engineering Advisor. He formed Bayou Petrophysics in 1999 and currently consults part-time and provides technical training in geophysical reservoir applications and other areas of petrophysics, and serves the SPE and SPWLA as a technical editor in various areas of geophysical reservoir characterization and hydrocarbon reservoir imaging. He has been a co-author on many technical papers, many of which include reservoir characterization and reservoir modeling. He has served on many panels, committees, and organizations, including as a member of the reservoir engineering committee of the Shell Society of Petroleum Engineers. He is IWCF certified, the SPE Distinguished Member of the Year in 2006, and a SPE Distinguished Lecturer for 2007 and 2008. He has authored several books and has been actively involved in the areas of reservoir engineering and geoscience.

**DR. JOHN (JACK) B. THOMAS** has been a consultant for over 30 years of experience in reservoir engineering and rock physics. He has been a member of the Porous Media Group at Shell Oil Company since 1994, serving as Technical Advisor. He has authored or co-authored over 150 papers on reservoir engineering and rock physics, including over 250 patents. He has received numerous awards and honors, including the SPE Distinguished Service Award in 2003, the SPE Formation Evaluation Award in 2005, and the SPE Distinguished Member Award in 2006. He is a member of the SPE Eastern Regional Meeting, the SPE Rocky Mountains Regional Meeting, and the SPE Gulf Coast Section. He is a member of the American Association of Petroleum Geologists and the Society of Petroleum Engineers.

**MR. RONNIE TUCKER** is a seasoned Irish business executive and financial and economic consultant with extensive practical experience. He has worked for a corporate business process reengineering Project Director in Helsinki, as a CFO/COO in New York, as a Director of Corporate Risk Management in Brussels and as a Financial Analyst in Silicon Valley. He has managed and delivered over 80 projects in the US, Europe, and Asia and has sat on a number of board audit, finance and governance sub-committees. Since 2012 he is a Divisional Director with Inscenit Consultants. Since 1997 he has trained more than 4,000 non-financial managers in financial analysis, economics and accounting for multinationals, governments and many banks. He also attended management at the University of National Ireland and has spoken on governance for the Institute of Chartered Accountants in Ireland. Ronnie has a particular interest in the petroleum industry. In 2012 he taught MPs and civil servants from the Ministries of Finance and Natural Resources in the United Arab Emirates, and on production sharing contracts. He also recently trained government officials from Myanmar in energy project economics and finance.
MR. ROBERT (BOB) V. WESTERMARK is a seasoned engineer with international and domestic experience. He has worked both on and offshore including underbalanced, horizontal, multilateral, coiled tubing, methane, and geothermal drilling wells operations. As a team leader, he has run successful drilling and completion alliances and partnering programs. Mr. Westermark has also managed a research drilling test facility and two US Department of Energy multi-million-dollar projects. He is retired president of Grand Directions, LLC, drilling low cost horizontal wells for the parent company Grand Resources, Inc. and other partners. Mr. Westermark has authored and co-authored over 24 technical papers and he has been the instructor for numerous public and in-house courses, ranging from basic drilling classes to casing design and well control. In addition, he has taught advanced topics including horizontal drilling and multilateral completions. In this capacity, he communicates clearly with all levels of students, field and office employees, management, third party contractors and partners, and the public. He received a BS degree in Petroleum Engineering from Montana College of Mineral Sciences and Technology.

MR. DAVID WHITELEGG graduated with a BSc (Hons) in Environment Management from Cranfield University in the UK. He is a Chartered Environmentalist (CEnv) with the Society for the Environment, a Chartered Waste Manager with Chartered Institution for Waste Management (CIWM), and a full member (MIEMA) of IEMA (Institute of Environmental Management and Assessment). He is also a Graduate Member (GradIChemE) of IChemE. David is a member of the Professional Standards Committee at IEMA. He comes from a background in landfill and waste sites’ operations management, and is an experienced environmental and OH&S instructor with considerable international experience.

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

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

MR. LARRY WOLFSON has 34 years’ experience in planning and supervising well construction, including ERD, slim-hole and sub-sea wells. He received a BS in mechanical engineering from California State University Northridge, an MS in petroleum engineering from the University of Tulsa, and he is a registered petroleum engineer in California.

MR. RICHARD (DICK) G. WRIGHT has over 25 years of worldwide oil field experience, including management and implementation of directional drilling services and also has over 6 years’ experience training. His oilfield management experience includes resident positions in Southeast Asia and the Middle East. His areas of specialty include drilling operations technical training and drilling team leadership training. He is fluent in Spanish and is widely traveled in Central and South America. He received a BS in pre-veterinary medicine from New Mexico State University and an MBA in International Management from the American Graduate School of International Management.
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Transfers may be accepted if received 30 days or more before the course begins. There is not a transfer fee, but tuition will be due based on the registered course. PetroSkills may allow a registrant to transfer to a subsequent course after the 30-day cut off period providing the tuition fees have been paid and the requested course is open for enrollment. If a transfer is made and the subsequent course is not attended, no money will be refunded. Only one transfer per initial registration is allowed.

Substitutions may be made at any time without penalty.

If it is necessary to cancel an enrollment, less the non-refundable registration fee of $100.00(USD) per five days of training, less, will be refunded providing the cancellation is received in our office 30 days or more prior to the course start date. If tuition is not paid at the time of the cancellation, the $100.00(USD) registration fee per five days of training or less is due, providing the 30-day notice was received. For cancellations received less than 30 days prior to the course, the full tuition fee is due. Please contact the Customer Service Department if you wish to cancel or transfer your enrollment. Enrollments are not automatically cancelled if tuition payment is not received by the start of the course.

Transfers and cancellations will not be honored and tuition is forfeited and non-transferable for courses that have reached maximum participation regardless of the amount of notice given.

We reserve the right to cancel any course session at any time. This decision is usually made approximately two weeks prior to the course begins. If we cancel a course, enrollees will be given the opportunity to transfer to another course or receive a full refund, provided the enrollment was not transferred into the cancelled course late. Keep our cancellation policy in mind when making travel arrangements (airline tickets, hotel reservations, etc.), as we cannot be responsible for any fees charged for canceling or changing your travel arrangements. We reserve the right to substitute course instructors as necessary.
PetroSkills Blended Learning Skill Modules™ combine industry knowledge, expertise, content, and technology to develop workforce competency with the added benefit of:

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

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- Basic Drilling, Completion, and Workover Operations
- Basic Geophysics
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- Completions and Workovers
- Foundations of Petrophysics
- Gas Conditioning and Processing
- NODAL Analysis Workshop
- Process Safety Engineering
- Production Operations 1
- Production Technology for Other Disciplines
- Scale Identification, Remediation and Prevention Workshop

For more information, please visit petroskills.com/blended