With the “Great Crew Change” well under way, prospects for career advancement in the E&P sector are abundant. To take full advantage of these opportunities, industry professionals must possess the expertise and skills—technical and soft—necessary to assume positions of greater responsibility.

In addition to an aging workforce, the industry is further challenged by the increasingly sophisticated and technologically advanced methods required to explore and develop more difficult and complex plays. SPE provides a wealth of training courses to assist you in learning new skills—as well as honing existing ones—that will keep you abreast of the latest trends and developments in the industry.

SPE global training courses—developed by renowned subject-matter experts—were designed for introductory, intermediate, and advanced levels of proficiency. This catalog describes more than 100 available courses that cover a broad range of topics within SPE’s six technical disciplines. From these offerings, you will learn new methods, techniques, and best practices that enable you to effectively navigate the real-life challenges encountered by E&P professionals every day.

Presented at convenient locations around the world, courses are held in conjunction with SPE conferences and workshops, and at SPE training centers in Calgary, Dubai, Houston, and Kuala Lumpur. Training is also offered at other venues to meet the needs of our members. Courses last from one to five days, and if your organization has a group of employees interested in a particular course topic, we can deliver training to your worksite.

This robust inventory is one of many ways SPE advances its mission to collect, disseminate, and exchange technical knowledge. SPE training courses provide a fertile environment for the exchange of information and ideas that result in solutions to real-world problems, increased knowledge, and personal satisfaction.

SPE global training courses represent one way to proactively take charge of your career and learn from some of the brightest minds in the industry. After reviewing this catalog, please access the course schedule at www.spe.org/go/learn and choose a training course today.

Regards,

Egbert Imomoh
2013 SPE President

Submit Your Ideas

SPE is always looking for new training course ideas, particularly in the areas of emerging technologies. If you have expertise in an area not already covered or know someone who does, please send a topic, course outline, and bio of the instructor to trainingcourses@spe.org.
General Information

About SPE
The Society of Petroleum Engineers is a not-for-profit organization. Income from training courses will be invested back into SPE to support many other Society programs.

When you attend an SPE training course, you help provide even more opportunities for industry professionals to enhance their technical and professional competence.

Scholarships, certification, the Distinguished Lecturer program, and SPE’s energy education program—Energy4me—are just a few examples of programs supported by SPE.

SPE’s mission is to advance the dissemination of technical knowledge pertaining to the oil and gas industry. Face-to-face interactions with peers at an SPE training course provide a stimulating environment for exchanging new ideas and exploring solutions to real problems. Smaller classes allow individual interaction with knowledgeable experts and ensure increased learning potential.

Attend an SPE training course to learn new skills and gain the knowledge you need to help you succeed.

Contact Us
SPE training courses are offered in convenient locations around the world. Courses are held in conjunction with SPE conferences, workshops, local sections, and at SPE training centers in Calgary, Dubai, Houston, and Kuala Lumpur.

Register for SPE training courses online at www.spe.org/go/learn or send an email to trainingcourses@spe.org.

Schedule
Get the current schedule of training courses—wherever you are. Scan this QR code with your smart phone or visit www.spe.org/go/learn.

Please note: Schedules are subject to change. Be sure to check the online calendar often for the most up-to-date listing of courses available in your area.

SPE Training Centers
In an effort to support and build the career and lifelong learning needs of its members, SPE has four dedicated training centers in Calgary, Dubai, Houston, and Kuala Lumpur.

<table>
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<tr>
<th>SPE Training Centers</th>
<th>Calgary Training Center</th>
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<th>Houston Training Center</th>
<th>Kuala Lumpur Training Center</th>
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<td>900 521 – 3rd Avenue S.W.</td>
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<td>Fortune Towers, 31st Floor</td>
<td>Suite 1075</td>
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<td>T: +1.403.930.5454</td>
<td>T: +971.4.457.5800</td>
<td>Offices 3101 &amp; 3102</td>
<td>Houston, TX 77042-3455 USA</td>
<td>Mid Valley City</td>
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<tr>
<td>F: +1.403.930.5470</td>
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<td>F: +1.713.779.4216</td>
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SPE Course Cancellation Policy
To receive a full refund, all cancellations must be received in writing no later than 14 days prior to the course start date. Cancellations made after the 14-day window will not be refunded. Send cancellation requests by email to trainingcourses@spe.org; by fax to 1.866.460.3032 (US) or +1.972.852.9292 (outside US); or mail to SPE Registration, PO Box 833836, Richardson, TX 75083.
For more details, please contact us at trainingcourses@spe.org.

Online (self-paced) Training
Online training can save you time and money by eliminating the expenses associated with travel.
SPE is working to bring you state-of-the-art online courses that will allow you to develop at your own pace, 24/7, around the globe.
Below is one course that will be available soon. Keep checking www.spe.org/training for more information.
• Hydraulic Fracturing/Pressure Analysis

Course Descriptions
SPE training courses cover a broad range of topics to meet the needs of the petroleum engineering professional. You will learn new methods, techniques, and best practices to deal more effectively with the technical challenges you face each day.
SPE offers more than 100 courses ranging from introductory to advanced, and covers the following technical disciplines:

- Drilling and Completions
- Reservoir Description and Dynamics
- Health, Safety, Security, Environment, and Social Responsibility
- Management and Information
- Projects, Facilities, and Construction
- Production and Operations

We are continually adding new courses. If a course in your discipline is not listed, be sure to check our online catalog for a complete and up-to-date listing of training courses at www.spe.org/training/catalog.
Advances in Formation Testing

Hani Elshahawi

Over the past two decades, formation testing has emerged as one of the most critical petroleum reservoir evaluation activities. As a result of increased drilling and testing costs in deep water, high-pressure, high-temperature, environmentally sensitive and other frontier areas, modern formation testing has become the primary—often only—source of information on fluid properties. Additionally it has provided insights into reservoir architecture issues that were previously the sole territory of conventional well testing.

Attendees of this course will gain a good understanding of the state-of-the-art in formation testing and its changing role, vis-à-vis other disciplines. The fundamental applications and interpretations of formation testing and highlights of the advances made over the last decade will be reviewed. Examples will be shown to cement the learning and to highlight the merits of new technology and the value of integration.

Topics Include:
- Pressure testing
- Pressure gradients
- Fluid sampling and down hole fluid analysis
- Permeability and pressure transient testing
- Application to reservoir and fluid characterization
- Micro-fracturing
- The value of integration

Why You Should Attend
By the end of the course, you should be able to separate myths from realities. You will be better equipped to address asset or well objectives and translate them into an optimized formation-testing program.

Who Should Attend
This course is designed for individuals who work in reservoir modeling, fluid analysis, or formation evaluation.

Days: 5
Level: Intermediate

Appraising and Developing Shale Gas and Shale Oil Reservoirs

Creties Jenkins

This course will help you understand the controls on hydrocarbons-in-place, resource distribution, and productivity. You will learn how to collect, analyze, and interpret critical data from multiple disciplines, recognize why reservoir characterization and drilling/completion practices both play key roles, and understand why various shale gas and shale oil wells perform differently. You’ll also know the key questions to ask and steps to take in assessing a shale accumulation and be able to apply appraisal and development strategies that are cost-effective.

Topics Include:
- Review the origin of shales and shale hydrocarbons, and discuss the various core, log, and seismic datasets used to characterize them
- Review the mechanisms of oil and gas production and key drilling/completion practices
- Discussion of how to estimate resources and reserves, and a review of those factors controlling commercial success
- Apply what’s been learned to shale gas and shale oil case studies

Why You Should Attend
This course provides practical insights and tools for use in evaluating shale gas and shale oil opportunities.

Who Should Attend
Geoscientists, engineers, and managers who want to learn more about what controls productivity in these accumulations, the data that need to be collected and evaluated, which techniques are being used to drill/complete wells and forecast their performance, how to estimate resources and reserves, and what the key differences are between the various shale gas and shale oil plays. No previous experience with shales is necessary.

Days: 2
Level: Intermediate

Appraising and Developing Shale Gas Reservoirs

Creties Jenkins, Dilhan Ilk

This course will help you understand the controls on gas-in-place, resource distribution, and productivity. You’ll learn how to collect, analyze, and interpret critical data from multiple disciplines and why reservoir characterization and drilling/completion practices play key roles. It will help you understand why various shale gas (and shale oil) reservoirs perform differently, know the key questions to ask, steps to take in assessing a shale accumulation, and be able to apply appraisal and development strategies that are most cost-effective.

Topics Include:
- Review the origin of shales and shale gas
- Discuss the various core, log, and seismic datasets needed to characterize them
- Review the mechanisms of shale gas production and key drilling/completion practices
- Discuss how to estimate resources and reserves
- Review of factors controlling commercial success
- Apply what’s been learned to case studies including the Antrim, Barnett, Eagle Ford, Fayetteville, Haynesville, Horn River, Lewis, Marcellus, Montney, and Woodford shales

Why You Should Attend
This course provides practical insights and tools for use in appraising and developing shale gas reservoirs.

Who Should Attend
Geoscientists, engineers, and managers who want to learn more about how to evaluate these accumulations, what controls their productivity, which techniques should be used for forecasting well performance, and how to estimate resources and reserves.

Days: 1
Level: Intermediate
Artificial Lift

Bill Lane, Rajan Chokshi

This course will help develop a solid foundation in all forms of lift and the concepts of the selection process to maximize production and return on investment.

Topics Include:
• Advantages and limitations of each system
• Application considerations
• Sample performance predictions

Why You Should Attend
This class helps ensure a broad view of artificial lift, particularly when in-house expertise is limited to one-or two-lift systems.

Who Should Attend
This course is for production and field operations engineers, junior and senior petroleum engineers and field technicians as well as geoscientists and reservoir engineers who wish to understand the implications of production systems on their field reservoirs.

Days: 1
Level: Intermediate

Asset Management—Tools, Process, and Practice

Alok Jain

Participants in this course will learn to develop and put in context an integrated asset management plan. They will begin by defining the asset from the earliest phases and work through its lifecycle, including the entire infrastructure, facilities, equipment and services.

Topics Include:
• Define the contents of an asset management plan
• External factors such as fiscal terms, host government policies, regulatory requirements, etc.
• Macroeconomic factors such as the price of products, goods, and services
• Internal factors such as company policies, external commitments, resources, decision-making processes and criteria, roles and responsibilities, authority guidelines, rewards, and budgets

At the end of the course, participants should understand:
• The asset management process, including key decisions and deliverables
• Roles of multi-disciplinary team members and monitoring their performance
• Information needed from each discipline in various stages of the asset lifecycle
• Role of benchmarking, post-auditing, and continuous improvement
• An overview of asset management tools and examples from the field, including frequent mistakes

Why You Should Attend
You’ll learn asset management strategies and skills that can immediately be utilized in the field.

Who Should Attend
This course is designed for professionals across the full spectrum of oil and gas operations.

Days: 2
Level: Advanced

Basic Oilfield Corrosion and Control via Chemical Solutions

Mohamed Abou Zour

This course will help attendees develop the awareness of importance and cost of corrosion and how it can be managed and mitigated. It teaches the skills of dealing with chemicals, techniques to evaluate their performances, chemical applications and design to control corrosion. It will also help attendees learn corrosivity monitoring and the efficiency of the treatment.

Topics Include:
• Corrosion Cost and Impact on the economy, safety, environmental, health and reputation
• Factors affecting corrosion—metallurgical, water chemistry, oil chemistry, solids and emulsifies, and others
• Facets of corrosion monitoring, short, medium and long term
• Coordinating all aspect of corrosion control, risk based control/inspection, information versus data and continuous improvement loops

At the end of this course, participants should leave with a full understanding of:
• Managing corrosion data and directing focus to high risk operations and dedicate more effort and manageability to reduce the risk on valuable assets
• Types of inhibitors, main effective molecules, inhibitor formulation, solvent packages and aspects of formulation chemistries

Why You Should Attend
This course will help broaden your general knowledge around oilfield corrosion and its impact and control options. Participants will familiarize themselves with various lab techniques used for evaluation of corrosion inhibitors. You will understand design methods in delivery of corrosion inhibitors and their treat rates using continuous, batch and slug treatments down-hole and upstream.

Who Should Attend
This course is intended for new graduates with chemistry or engineering backgrounds, mid-level engineers and technologist who have some prior knowledge of oilfield corrosion; all personnel involved in oil and gas production and processing; management wanting to increase awareness of corrosion impact on business operations and how negative outcomes can be mitigated.

Days: 2
Level: Introductory

Special Requirements:
Participants should have a basic understanding of chemical handling, chemistry functional groups, basic lab equipment, corrosion reaction and attacks, and performance monitoring options.
**Basic Pressure Transient Test Analysis**

W. John Lee

This course teaches the systematic analysis and design procedures for testing pressure buildup and flow tests. Example applications focus on identifying the appropriate reservoir model, estimating effective formation permeability, and quantifying damage or stimulation.

**Topics Include:**
- Semilog analysis methods
- Type curves and diagnostic plots
- Gases and multiphase flow
- Average drainage area pressure
- Horizontal wells
- Well test design

After this course, participants should have an understanding of:
- Naturally-fractured reservoirs
- Hydraulically-fractured wells
- The effects of input data errors

**Why You Should Attend**
This course will provide you with an understanding of the fundamentals of buildup and flow test analysis—an understanding that will provide insight into the strengths and limitations of the methodology used in modern commercial pressure-transient test analysis software.

**Who Should Attend**
This is a basic course in well test analysis and design, suitable for engineers and physical scientists who have little if any background in well test theory or practice. It focuses on applications rather than theory.

**Days:** 2  
**Level:** Introductory

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**Basic Reservoir Engineering**

Hemanta Mukherjee

This course presents the geologic origins and the important properties of petroleum reservoirs, and how to estimate their potential production. Participants learn through a combination of class problems, examples and workshops.

**Topics Include:**
- Depositional environments, basic structures, and hydrocarbon traps
- Large scale exploration techniques
- The properties of reservoir rock, such as porosity, fluid saturation, pore volume, and permeability
- Reservoir fluid properties, such as API gravity, formation volume factor, gas solubility, density, and viscosity
- Common classes of reservoirs according to the types of fluids they contain and their characteristic performance
- Sources of reservoir data

**Why You Should Attend**
This intensive course will raise participant’s skill set beyond the fundamentals of reservoir engineering and provides an excellent opportunity to share ways to overcome challenges in the field.

**Who Should Attend**
This course is for engineers and technologists who want to learn more about reservoir engineering.

**Days:** 5  
**Level:** Introductory  
**Special Requirements:** Attendees must bring laptop to class. Participants should have a bachelor’s degree and two to four years of oilfield experience.

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**Cased Hole and Production Log Evaluation**

James J. Smolen

This program is a comprehensive and up-to-date course covering the new and traditional wireline diagnostic techniques for the surveillance of cased wells. Smolen’s 1996 book, *Cased Hole and Production Log Evaluation* is provided to participants of this course.

**Topics Include:**
- Formation evaluation through casing
- Well integrity—cement and casing inspection
- Water identification and fluid movement in both injection and producing wells

**Why You Should Attend**
This course is a unique opportunity to learn proven cased hole and production log diagnostic techniques.

**Who Should Attend**
This course is for reservoir and production engineers and geologists, petrophysicists, log analysts and others involved in well surveillance, maximizing recovery, identifying production problems, planning workover operations or utilizing production information in reservoir studies.

**Days:** 5  
**Level:** Advanced

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View the current schedule, expanded course descriptions, and register online at [www.spe.org/go/learn](http://www.spe.org/go/learn).
Drilling and Completions

Health, Safety, Security, Environment, and Social Responsibility

Management and Information

COURSE DESCRIPTIONS

Casing and Tubing Design Seminar

Peter Erpelding

This course covers all the relevant subjects needed to understand the structural mechanics of downhole tubulars. Discussions begin with the fundamental design principles and progresses through materials, performance, loads and design. Participants will also learn to calculate tension, compression, burst collapse, yield and threshold strength.

Why You Should Attend
This intensive hands-on course will give you the proficiency and confidence you need to design safe and cost-effective casing and tubing strings.

Who Should Attend
This course is for drilling and completion engineers, and drilling supervisors who want additional insight into casing and tubing design.

Days: 2
Level: Intermediate

Special Requirements: Attendees need to bring relevant field well designs and problems to use as in-class exercises.

Cement Evaluation and Remediation

James J. Smolen, William K. (Bill) Ott

This course examines methods for detecting fluid channels, voids and leaks, and how to repair them. It also covers the logging tools and technologies used to evaluate the integrity of the cement prior to initial completion or anytime during the life of the well. The first day of class is dedicated to evaluating cement and the second day to repairs.

Why You Should Attend
Poor cement coverage affects nearly every aspect of a well. This course will give you a better understanding of some critical well safety and integrity issues.

Who Should Attend
This course is for drilling and completion engineers, field supervisors, petroleum engineers and geologists as well as managers and regulatory officials who need to understand what can go wrong with a cement job and how it can be repaired.

Days: 2
Level: Intermediate to Advanced

Chemical Enhanced Recovery

Mojdeh Delshad

This course is a review of the fundamental principles of displacement and phase behavior needed to understand chemical EOR methods. It provides an overview of four major types of chemical EOR, specific chemicals in each category, conditions under which they work, and special problems encountered with each.

You will gain a better understanding of why EOR is used, greater awareness of the classifications of EOR methods, increased ability to judge which chemical EOR method is appropriate for a given reservoir, and increased knowledge of how each chemical EOR method works.

Topics Include:
- Displacement fundamentals
- Polymer flooding
- Conformance improvement methods
- Surfactant/polymer flooding
- Surfactant/polymer optimization

At the end of this course, participants should have an understanding of:
- Alkaline/surfactant/polymer flooding
- Chemical flooding of carbonate reservoirs
- Commercial simulators for CEOR

Why You Should Attend
You will broaden your understanding of enhanced oil recovery techniques. If you’re new to EOR, you will get a solid foundation on which to build.

Who Should Attend
This course is designed for early-career petroleum, reservoir, production and facilities engineers, as well as managers, government officials, and others who want to learn more about enhanced oil recovery.

Days: 2
Level: Introductory

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
This course outlines the unique characteristics of coalbed methane (CBM) reservoirs. It reviews key reservoir data and explains how variations in the properties of coal impact completion strategies, performance, and recovery. Comments and examples provide an overview of CBM developments around the globe. Participants will also learn to recognize the factors that control the future of the industry.

**Topics Include:**
- How to collect, screen, and interpret critical data
- How to calculate reserve volumes and forecasting production
- Computer simulation
- Future opportunities and technologies

**Who Should Attend**
This course is for engineers, geologists, geophysicists, investors, managers, government officials, planners, and technical support staff who are interested in evaluating CBM fields and understanding the future of the industry.

**Why You Should Attend**
At the end of this course, participants should have an understanding of:
- Reasons why the appropriate drilling and completion method must be refined for each play
- Examples of the steps, costs and timelines for the overall development process
- Common major mistakes made in the field and in the lab
- Actual correlations between production rates and geologic or completion parameters
- Application and limitations of various production forecasting and simulation methods
- Emerging technology and potential applications

**Days:** 1  
**Level:** Intermediate  
**Special Requirements:** Participants should have a basic understanding of general engineering and geologic terms.

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This course focuses on the geologic and engineering aspects of defining gas-in-place, reserves, appropriate completion methods, and forecasting production for coalbed methane (CBM) reservoirs. Special focus is on due diligence and data quality screening techniques for preparing reliable forecasts and property valuations.

You will understand how to collect, quality-check, and interpret critical data, and determine how to select the optimum well completion and stimulation methods.

**Topics Include:**
- Variability of the commercially successful CBM plays in the US, Canada and Australia
- The urgency and activities for developing CBM outside North America
- Key geologic characteristics and evaluation issues
- Reasons the CBM projects in China, Indonesia and South Africa are slow to develop
- Steps and class examples for calculating reserve volumes and forecasting production
- Common mistakes by operators and evaluators

**Who Should Attend**
This course is for engineers, geoscience professionals, researchers, managers, business development specialists, and technical support staff.

**Why You Should Attend**
Those familiar with oil and gas development who are interested in a thorough review of the concepts, techniques and strategies needed for evaluating and developing commercial coalbed methane projects.

**Days:** 2  
**Level:** Intermediate-to-Advanced  
**Special Requirements:** Participants need to bring a laptop or calculator to solve example problems. Participants are assumed to have an understanding of general engineering and geologic terms.

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This course provides an introduction to coiled tubing (CT) as a tool for workover and drilling and completion services. It includes an overview of CT extended-reach operations, typical field applications, the properties of CT, its manufacture, surface equipment required for downhole deployment, as well as discussion of downhole CT tools. A significant portion of the course covers CT mechanical performance, including working limits, buckling, and fatigue. A discussion of CT drilling technology and hydraulics is also included.

**Topics Include:**
- An introduction to surface equipment required to deploy CT during field operations
- Basic understanding of CT job modeling and fatigue tracking, and why it’s important
- Introduction to typical CT field applications
- Overview of selected new CT technology

**Who Should Attend**
Engineers and others that are involved in the design of CT equipment or uses of CT field services.

**Days:** 1  
**Level:** Introductory

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## Design and Optimization of Artificial Lift Systems

**Hemanta Mukherjee**

This course is an in-depth look at artificial lift, specifically for wells using continuous-flow gas lift or electrical submersible pumps (ESPs). The course can also be modified for a 5-day exclusive ESP training program with hands-on problem solving using SubPUMP software. In either case, there are plenty of class problems to solve in the workshops, and problem scenarios from the attendees are always welcome.

**Topics Include:**
- Understanding production systems
- The role of artificial lift in optimizing production
- Analysis and troubleshooting of continuous-flow gas lift systems
- The ESP, with detailed pump, motor, cable and shroud designs
- Handling of gas and solids

**Why You Should Attend**
The instructor for this course draws on 40 years of experience in the business. By the end of the week, you’ll have a firm grasp of ESP and gas lift systems.

**Who Should Attend**
This course is for engineers who are involved in oil production and the design, maintenance and optimization of artificial lift, especially electrical submersible pump and continuous-flow gas lift systems.

**Days:** 5  
**Level:** Intermediate to Advanced  
**Special Requirements:** A suitable degree in engineering or a BS degree is a pre-requisite for this class.

## Design of Fiber-Optic Distributed Temperature Sensing (DTS) Well Installations

**Dennis Dria, Bill Shroyer**

This course will provide attendees with a greater understanding of the technical and economic factors that influence the selection and justification for installing DTS systems in specific well types, the completion and monitoring components needed to deliver a DTS-monitored well, and installation and commissioning operations.

**Topics Include:**
- Background and procedures for selecting candidate wells for DTS monitoring and for selecting specific monitoring options such as DTS and pressure gauges. A brief set of examples and exercises will illustrate the cost-benefit analysis one may employ during the selection and planning phases.
- The completion components, installation equipment and processes, and the commissioning or start-up procedures needed to install and operate a fiber-optic monitoring system. Several well configurations will be considered, including offshore (dry tree), onshore oil, unconventional gas, thermal, and injection wells.

**Why You Should Attend**
To ensure the most value from DTS technology, field or planning staff needs the necessary skills to select candidate wells for DTS system use and to learn the proper installation and start up procedures.

**Who Should Attend**
This course is for completion, production, surveillance, and reservoir engineers who need an introduction to the design of fiber-optic distributed temperature sensing well installations.

**Days:** 1  
**Level:** Intermediate to Advanced

## Diagnosis and Analysis of Waterfloods

**Shah Kabir**

This course covers well performance diagnosis and performance forecasting. Attendees will learn modern analytical tools and deal with data and their quality that enter into various studies.

**Topics Include:**
- WOR type-curve for flood performance
- Production-well behavior with reciprocal-PI plot
- Injection-well performance monitoring with modified-Hall plot
- Estimating EUR with various empirical methods
- Capacitance-Resistance Model (CRM) formulations for different control volumes
- Introduction to spreadsheet program
- Understanding reservoir connectivity and aquifer influx at individual wells
- Probabilistic performance forecasting

**Why You Should Attend**
Broaden your horizons beyond conventional waterflood management and learn from an expert with over 30 years of experience.

**Who Should Attend**
This course is for reservoir, production, and operations engineers.

**Days:** 1  
**Level:** Intermediate
### Reservoir Description and Dynamics

#### Projects, Facilities, and Construction

**Reservoir Description and Dynamics**

- **Days:** 1
- **Level:** Intermediate

This course teaches the basics of waterflooding and enhanced oil recovery (EOR), illustrating the connection of each process to a few fundamental principles. It reviews the specifics of thermal and solvent EOR by relating basic principles to the results of cases from the field.

#### Production and Operations

**Reservoir Description and Dynamics**

- **Days:** 1 or 3
- **Level:** Intermediate

This course offers an overview of enhanced oil recovery (EOR) and improved oil recovery (IOR) processes with particular emphasis on issues relevant to field applications. **One-Day Topics Include:**

- EOR/IOR—What are they?
- Size of the PRIZE: Why must we consider it?
- Screening for EOR—timing: When is the right time for implementation? What options do we have? What tools do we need? Can we do it all?
- Waterflooding and chemical flooding
- Gas flooding—Hydrocarbon, CO₂, Air and N₂
- EOR in Naturally-Fractured Reservoirs
- Critical review and identification of broader issues and summary
- Case histories and exercises

#### Enhanced Oil Recovery Fundamentals

**Days:** 1

This course teaches an integrated version of the basics of waterflooding and enhanced oil recovery (EOR), illustrating the connection of each process to a few fundamental principles. It reviews the specifics of thermal and solvent EOR by relating basic principles to the results of cases from the field.

**Topics Include:**

- Definitions of EOR and polymer flooding
- Fundamentals of displacement
- Phase behavior, micellar-polymer flooding, and chemical methods
- Thermal flooding and the basics of solvent flooding

#### Diagnosis and Practical Solutions for Wellbore Fluid- and Heat-Flow Problems

Shah Kabir, Rashid Hasan

This course examines the fluid flow and heat transfer that occurs down hole during the production of oil and gas. Participants will use spreadsheets to compute the pressure and temperature profiles of single- and multi-string completions, and for both conduits of gas-lift wells. These basic principles will then be extended to tackle flow assurance and reservoir surveillance problems using examples from the field.

#### Three-Day Class Topics Include:

- Chemical flooding processes
- Gas flooding processes
- Thermal methods
- EOR in naturally-fractured reservoirs
- Horizontal wells for EOR
- Problems of asphaltene precipitation during EOR and certain HSE issues
- Summary review and identification of broader issues through interactive discussions

**Why You Should Attend**

Get an overview of EOR and IOR, explore your options and tools for screening and the best time for implementation.

**Who Should Attend**

This course is designed for petroleum, reservoir and flow-assurance engineers who are interested in enhanced oil recovery.

**Special Requirements:** Attendees need to bring a laptop to class. Participants should have moderate experience or exposure to the topic.

**Enhanced Oil Recovery Methods—A Life Line for an Old and “Tired” Reservoir?**

Hemanta K. Sarma

This course offers an overview of enhanced oil recovery (EOR) and improved oil recovery (IOR) processes with particular emphasis on issues relevant to field applications. **One-Day Topics Include:**

- EOR/IOR—What are they?
- Size of the PRIZE: Why must we consider it?
- Screening for EOR—timing: When is the right time for implementation? What options do we have? What tools do we need? Can we do it all?
- Waterflooding and chemical flooding
- Gas flooding—Hydrocarbon, CO₂, Air and N₂
- EOR in Naturally-Fractured Reservoirs
- Critical review and identification of broader issues and summary
- Case histories and exercises

**Why You Should Attend**

Get an overview of EOR and IOR, explore your options and tools for screening and the best time for implementation.

**Who Should Attend**

This course is designed for engineers with at least a bachelor’s degree in petroleum or chemical engineering. All other engineers, mathematicians, and physicists with at least a bachelor’s degree and some experience in reservoir engineering or numerical simulation can benefit from this course.

**Special Requirements:** Attendees need to bring a laptop to class. Participants should have moderate experience or exposure to the topic.

**Enhanced and Improved Oil Recovery Methods—A Life Line for an Old and “Tired” Reservoir?**

Larry W. Lake

This course teaches an integrated version of the basics of waterflooding and enhanced oil recovery (EOR), illustrating the connection of each process to a few fundamental principles. It reviews the specifics of thermal and solvent EOR by relating basic principles to the results of cases from the field.

**Topics Include:**

- Definitions of EOR and polymer flooding
- Fundamentals of displacement
- Phase behavior, micellar-polymer flooding, and chemical methods
- Thermal flooding and the basics of solvent flooding

**Why You Should Attend**

Every oilfield eventually relies on some form of enhanced oil recovery. Some require it from the start. This information can be crucial for continued productivity.

**Who Should Attend**

This course is designed for petroleum, reservoir, production and facilities engineers, as well as managers, and planners who are interested in enhanced oil recovery.

**Special Requirements:** Attendees need to bring a laptop to class. Participants should have moderate experience or exposure to the topic.
Ensuring Reliable SCAL Data for Reservoir Modeling

Shawket Ghedan

Special core analysis (SCAL) data are among the most critical reservoir input data for reservoir simulation models. This course will cover the concepts of the different elements of SCAL data, including reservoir wettability capillary pressure, two and three phase relative permeability, reservoir electrical properties, and the way these data would possibly change as a function of the reservoir heterogeneity and wettability.

Topics Include:
- Effect of reservoir saturation history and associated hysteresis of SCAL data
- Best practice of laboratory measurements of SCAL data as well as the interpretation of the experimental data considering the associated uncertainties
- Proper preparation and utilization of SCAL data for reservoir characterization and modeling, considering reservoir rock typing scheme and its wettability profile, if any
- Possible integration of SCAL data with log and well testing data
- The sensitivity of the prediction of the reservoir simulation models to the quality of SCAL data under different flooding conditions

Why You Should Attend
Learn how SCAL data can have a direct impact on the way fluids are allocated and distributed in the reservoir simulation models, the performance of secondary and EOR flooding processes, and accuracy of the oil and gas reserves estimates.

Who Should Attend
This course is designed for technical managers and team leaders, reservoir engineers, reservoir geologists, petrophysicists and geophysicists. This course is also designed for university and operating companies’ research and development staff.

Days: 1
Level: Intermediate

Evaluation of Canadian Oil and Gas Properties

Matthew J. O’Blenes, Peter C. Sidey, Cameron P. Six, Nora T. Stewart

This comprehensive course is an introduction or refresher for the techniques of evaluating Canadian oil and gas properties, but the techniques used in this course also apply to oil and gas properties elsewhere in the world. There is ample opportunity to work problems in class. By the end of this course, participants will be able to evaluate an oil and gas property and interpret evaluations done by others.

Topics Include:
- How to estimate oil and gas reserves and forecast production
- Forms of ownership and the state royalty regimes in Western Canada
- How to understand and categorize capital and operating costs
- How to discount future cash flows and interpret profitability
- How to check income tax calculations in evaluations
- Using evaluations for investments, acquisitions and divestments
- Understanding probability in estimating reserve

Why You Should Attend
The material in the course is very practical, with many tips and insights in evaluating wells, groups of wells, properties and companies.

Who Should Attend
This course is for engineers, geologists, geophysicists, land negotiators, accountants, technologists and anyone who wants to understand the process and results of evaluating Canadian oil and gas properties.

Days: 5
Level: Introductory to Intermediate

Field Development Economics

Mark Cook, David Palmer

In this course, participants will learn to construct an economic evaluation of a field development opportunity using common industry indicators. Supported by many practical examples, the course covers both greenfield and brownfield situations. The course is supported by full text, copy of slide presentation, glossary of terms, and bibliography.

Topics Include:
- Cash flow analysis
- Tax and royalty systems
- Production sharing contracts
- Discounting and assessing the cost of capital
- Economic indicators and project ranking
- Incorporating risk into economics
- Incremental project economics

Why You Should Attend
The information shared in this course will assure your decisions in the field are backed by sound economics.

Who Should Attend
This course is for engineers, geoscientists and managers who want to use economic methods for making field development decisions. Service company staff will learn to evaluate the economic benefits their products can offer, and investors will be better able to rank their oil or gas opportunities.

Days: 1
Level: Intermediate
Field Piloting for EOR/IOR Schemes

Ashok K. Singhal

In this workshop, participants have an opportunity to review and learn various strategies for piloting Enhanced Oil Recovery (EOR) and Improved Oil Recovery (IOR) projects. Most of the time is spent discussing the practical aspects and economics of EOR pilots, while keeping theoretical topics to bare minimum.

At the end of this course, participants should understand:
• Conceptualizing EOR schemes (Gas injection, Thermal recovery and chemical flooding)
• Screening of prospects for different EOR processes
• Reservoir surveillance and monitoring
• Development of EOR field pilots and interpretation

Why You Should Attend
Here is your opportunity to learn the latest EOR strategies from a recognized expert in the field and assure continued productivity.

Who Should Attend
This course is for petroleum, reservoir, production and facilities engineers, as well as managers, and planners who are interested in enhanced oil recovery.

Days: 1
Level: Intermediate

Flow Assurance—Managing Flow Dynamics and Production Chemistry

Abul Jamaluddin

This course presents an holistic approach to flow assurance. The course will introduce technologies, workflows and their deployment for the identification, characterization and management of flow impediments, such as slugging and precipitation of organic and inorganic solids. The course will present best practices and fit-for-purpose design solutions for minimizing the risk of flow stoppage while transporting hydrocarbons from “Pore to Sales Meter”. The principles will be demonstrated using field examples from around the world.

Topics Include:
• Introduce key impediments to flow, including slugging and precipitation of organic and inorganic solids, with examples from various challenging environments
• Review technologies for capturing fluid samples and characterizing their PVT properties
• Define current measurement and modeling approaches for characterizing production-chemistry impediments, such as asphaltenes, paraffin waxes, hydrates and inorganic scales
• Introduce fluid flow and heat transfer concepts and their relationship in precipitation of organic and inorganic solids
• Demonstrate the value of a systematic and holistic flow assurance program for production systems and operations, using case studies from various field locations around the globe

Why You Should Attend
Assuring unimpeded flow from the reservoir to the refinery has game-changing impact on field development. Unnecessary investments can be avoided, when engineers are able to characterize and understand the fluid phase behavior controlled by the flow dynamics and production chemistry in wellbores and flow lines.

Who Should Attend
This course is intended for engineers and chemists in the upstream and downstream segments of the petroleum industry. This course will also provide department, asset and technology managers with an appreciation of the risks, challenges and solutions for free flowing hydrocarbon product.

Days: 1
Level: Intermediate

Forecasting Well Production Data in Unconventional Resources

Dilhan Ilk

This course provides a comprehensive methodology for the diagnosis, analysis, and forecasting of well production data in unconventional resources. An extensive evaluation of the diagnostic tools for assessing data viability, checking data correlation along with flow regime identification is presented. The principal focus is to diagnose the characteristic flow regimes associated with well production and apply methodologies to estimate performance parameters and forecast production. These methodologies include simple analytical tools, decline curves, and more complex techniques such as non-linear numerical simulation. Examples from tight gas sands, gas shales, and liquids-rich shale systems will illustrate the theoretical considerations and practical aspects.

At the end of this course, participants should understand how to:
• Collect, analyze, and interpret critical data for well performance analysis
• Identify well performance characteristics and flow regimes using diagnostic plots
• Estimate key reservoir and completion parameters
• Forecast future performance for various production/completion and field development scenarios
• Establish the optimal workflow to help quantify well performance uncertainty and non-uniqueness

Why You Should Attend
Production analysis and forecasting in unconventional resources are challenging tasks due to the high degree of uncertainty and non-uniqueness associated with evaluating well completion and understanding reservoir properties. This course provides guidelines on the interpretation of data behavior and a consistent approach to analyze and forecast production in unconventional resources.

Who Should Attend
Technologists, engineers, and managers involved in evaluating well performance (time-rate-pressure) data for optimizing production, understanding completion efficiency, and estimating reserves and ultimate recoveries.

Days: 1
Level: Intermediate

Special Requirements: Participants should have a basic understanding of petroleum engineering terms.

Days: 1
Level: Intermediate

Special Requirements: A basic understanding of petroleum production engineering, chemistry and project management.
Formation and Prevention of Oilfield Scale: From the Laboratory to the Field

Eric Mackay, Ken Sorbie

This course introduces state-of-the-art oilfield scale management, with field examples to illustrate the basic science. Participants have the opportunity to run Heriot-Watt’s software, SCALEUP, to predict the formation of scale, and the university’s SQUEEZE VI software to create field-scale inhibitor squeeze designs.

The course material draws on the research and industry experience of the presenters. It provides both the underlying theory in an accessible manner and examples of how to apply that knowledge in the field.

Why You Should Attend
This is a unique opportunity to learn from people who developed some of the industry’s best tools for managing oilfield scale.

Who Should Attend
This course is for production technologists, engineers, oilfield chemists and anyone concerned with flow assurance issues. It is also useful for those who work in the service, scale inhibitor and sulphate industries.

Days: 2
Level: Intermediate
Special Requirements: Participants are encouraged to bring their field formation, injection water composition data and other properties of their reservoirs for discussion in class.

Fundamentals of Field Development Planning for Coalbed Methane Fields

Laurent Alessio

This course offers insights on reservoir characterization approaches, integrated development planning methods, uncertainty management techniques, and modeling workflows accumulated through the experience of a number of CBM plays. Selection will also be reviewed, including approaches to model the performance of different well and completion configurations and implementing these into a full field modeling strategy.

Techniques to assess the economic potential of the play will be illustrated, including methods for high-grading development areas into sectors of different attractiveness.

Topics Include:
- Fundamentals of CBM
- Reservoir characterization
- Uncertainty management
- Static modeling and volumetrics
- Dynamic modeling and forecasting
- Concept select techniques and field development planning optimization
- Subsurface high-grading and value of information

Why You Should Attend
Learn how to model the performance of different well and completion configurations and implement them into a full field modeling strategy.

Who Should Attend
This intermediate to advanced level course is for geologists, reservoir engineers, subsurface managers, and team leader.

Days: 1
Level: Introductory

Fundamentals of Reservoir Description and Modeling with Geostatistics

David O. Ogbe

This course introduces engineers, geologists and geoscientists to the fundamental theory and practice of reservoir description and modeling for reservoir management. Participants will learn the fundamental concepts of reservoir description and modeling using geostatistical techniques. This course emphasizes the principles and practice of integrated studies and uncertainty analysis.

Topics Include:
- Fundamentals of reservoir modeling
- Overview of statistics and probability
- Data analysis, quality control and preparation
- Variogram modeling
- Kriging techniques
- Stochastic simulation and modeling case studies
- Overview of uncertainty analysis and integrated studies

Why You Should Attend
In this course, you’ll learn how to apply reservoir description and modeling to support reservoir management, and you’ll be able to recognize the limitations and opportunities of reservoir modeling.

Who Should Attend
This course is for petroleum engineers, geologists and geoscientists who want to apply reservoir description and modeling techniques for reservoir management. It is also for managers and supervisors who wish to update their skills to the current level of the technology.

Days: 2
Level: Introductory

Drilling and Completions

Health, Safety, Security, Environment, and Social Responsibility

Management and Information
**Reservoir Description and Dynamics**

**Projects, Facilities, and Construction**

**Production and Operations**

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**Reservoir Description and Dynamics**

**1 Day**  
**Level:** Introductory

This course is a fast-paced, lecture-style overview of the fundamental concepts and elements of reservoir simulation. No equations are used. Instead, we discuss various phases of reservoir modeling, including when to use reservoir simulation, the use and misuse of reservoir simulation, elements of a reservoir simulation model, the types of reservoir simulators and their features. The course also covers coordinate geometries and types of models, managing a simulation run, defining initial conditions, history matching and prediction.

**Topics Include:**  
- The sources of data  
- The facets of the study  
- Exposure to our reservoir simulation 'jargon'

**At the end of this course, students should:**  
- Have an understanding of the 'elements' of a reservoir simulation model  
- Understand how models are built  
- Gain an appreciation for the fundamental concepts of reservoir simulation  
- Gain a view on the tools used in the industry

**Why You Should Attend**

If your career is in the upstream side of the business, you need a working knowledge of reservoir simulation. Upon completion of this course, you’ll know the basics, such as why and how a model is built, the various sources of data, how wells are modeled, and what to look for in a reservoir simulation study.

**Who Should Attend**

This course is intended for those who need a quick start to their learning curve. It is designed for recent university graduates, early-career professionals, earth scientists, and anyone who requires a high-level introduction to reservoir simulation.

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**Fundamentals of Retrograde Reservoir Fluid Properties, Characterization, and Flow in Porous Media**

**1 Day**  
**Level:** Introductory

This course focuses on the properties of reservoir fluids, beginning with the most fundamental definitions and moving on to show how fluid properties are measured and reported. Fluid properties are then put in the context of the subsurface geology to explain how they affect reservoir performance.

**Topics Include:**  
- Sampling reservoir fluids: oils, gas, and condensates  
- Tests used to describe reservoir fluid parameters  
- The use of EOS models  
- Calculating parameters and analyzing material balance  
- Coupling fluids to rock properties  
- Measuring relative permeability, gas condensates, and volatile oils  
- Other topics as a function of class interest: Contamination with synthetic drilling fluids, gas-phase measurements, and the phase behavior of gas injection processes

**Why You Should Attend**

This course is a solid foundation for building your understanding of reservoir fluid dynamics.

**Who Should Attend**

This course is for engineers who need to know more about optimizing gas condensate, rich gas or volatile oil reservoirs.

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**Geological Sequestration of CO₂**

**3 Days**  
**Level:** Intermediate  
**Special Requirements:** Attendees must bring laptops to class.

This popular course introduces various aspects of the geological storage or “sequestration” of CO₂, an important tool for combating global warming. Although much of the technology is similar to that of CO₂ enhanced oil recovery (EOR), there are important differences. This course draws upon the instructors extensive practical experiences in CO₂ EOR projects and the development of CO₂ storage projects.

**Why You Should Attend**

Carbon Capture and Storage (CCS), another name for CO₂ sequestration, is an emerging technology that is important for the future of the industry. The environmental aspects of CO₂ make this a 21st century skill. If you like to stay ahead of the curve, you’ll enjoy this course.

**Who Should Attend**

This course is designed for petroleum and reservoir engineers, production and facilities engineers, managers and government officials and others who need to know the basics of CO₂ sequestration.
Drilling and Completions

Geomechanical Aspects of CO₂ Storage

Safdar Khan

This course is an overview of the essential geomechanical aspects to consider when assessing the suitability of a carbon storage site and maintaining the site safely over time. Participants will gain an understanding of the many factors that can affect the well, reservoir and caprock integrity of potential geological carbon storage sites.

Topics Include:
- The basic concepts of stress and strain, including mechanical and acoustic properties, rock strength, pore pressure and in-situ stresses
- Geomechanical responses to CO₂ injection
- A recommended geomechanics data acquisition program and introduction to coupled reservoir geomechanics simulation for the analysis of caprock integrity
- Effective reservoir monitoring, including injection-induced microseismicity, and techniques for monitoring ground and subsurface deformations

Why You Should Attend
The technology behind the geomechanical sequestration of CO₂ has advanced rapidly in the last few years. This course is an excellent opportunity to introduce yourself to the subject, or to bring your knowledge up to speed.

Who Should Attend
This course is for engineers, researchers, geoscientists, technologists and regulators involved in CO₂ sequestration.

Days: 1
Level: Introductory to Intermediate

Geomechanics for Effective Shale Gas Exploitation

Safdar Khan, David Handwerger

This course explains the essential aspects of geomechanics in shale gas. It offers a unified approach that combines the theoretical, laboratory and field aspects of exploring unconventional reservoirs. Case histories are used to reinforce the concepts.

Topics Include:
- Predicting pore pressure, wellbore stability and hydraulic fracturing
- Evaluating shale heterogeneity
- Tight Rock Analysis (TRA) and scratch testing
- Estimating anisotropic parameters using acoustic azimuthal measurements
- Critical elements of an effective stimulation program
- The influence of natural fractures on fracturing
- Successful shale completion strategy and best practices

Why You Should Attend
Geomechanics plays a critical role in successfully optimizing shale gas exploitation. This course will help you make better field development and operational decisions.

Who Should Attend
This course is for engineers, geoscientists, and technologists involved in exploration, drilling, completions, and production in unconventional reservoirs.

Days: 1
Level: Intermediate

GHG and CCS Regulatory and Legal Frameworks

Kipp Coddington

This course reviews the evolving regulatory and legal frameworks that will govern Green House Gases (GHG) and the emerging field of Carbon Capture and Storage (CCS). As with any industrial activity, CCS will require various operating rules. In this course, participants will gain an understanding of the broad legal framework that defines the day-to-day operating procedures of the industry.

Topics Include:
- United Nations Framework Convention on Climate Change (UNFCC)
- The Kyoto Protocol, Copenhagen Accord and the Cancun Agreement
- Current international climate negotiations
- Surface and subsurface property rights issues for geologic storage
- Remaining gaps in legislation and regulation

Why You Should Attend
Lawmakers at both the national and state level are moving on issues that will affect all future CCS projects. This is your chance to learn from one of the industry’s leading legal experts.

Who Should Attend
This course is for oil and gas professionals, executives, managers, regulators and attorneys who need to understand the basic legal and regulatory framework that is shaping the emerging CCS industry.

Days: 1
Level: Intermediate
History Matching and Conditioning Reservoir Models to Dynamic Data

Akhil Datta-Gupta

This course explores ways to incorporate production data into high-resolution reservoir models using both conventional and fast-flow simulation techniques, and it examines the merits of various history matching workflows practiced in the industry. Both assisted history matching and automatic history matching (inverse modeling) techniques will also be covered. Field applications from various parts of the world will be discussed to illustrate the current state of the art, its advantages, and limitations.

Topics Include:
- Production data integration: Background and theory
- Flow simulation through geologic models: Streamline approach
- Streamline-based production data integration
- Assisted history matching/inverse modeling with finite difference models
- Experimental design: Background and applications
- History Matching: Some recent developments (EnKF and MCMC)

Why You Should Attend
This course offers unique access to one of the industry’s leading contributors in the field of fast-flow simulation methods and the integration of dynamic data into high-resolution geologic models.

Who Should Attend
This course is intended for engineers, geologists and geophysicists interested in reservoir characterization, reservoir management/optimization and history matching of geologic models.

Horizontal Well Completions

Sudiptya Banerjee, Aaron Burton

This course develops strategies for completing horizontal wells. It covers both cased-hole and open-hole configurations, either with or without sand control. Participants will learn the applications and dynamics of horizontal wells, including drill-in fluids, hole displacement, cementing, perforating, and stimulation. They will also learn the guidelines for selecting stand-alone gravel packs.

Topics Include:
- Completion options
- Cased-hole horizontal completions
- Perforating and stimulating horizontal wells
- Open-hole horizontal completions
- Drill-in fluids
- Zonal isolation and inflow control
- Displacing the drill-in fluid

Why You Should Attend
Horizontal drilling was a step-change in the industry, but the technology is more expensive and riskier than drilling vertical or deviated wells. As a drilling, completion or reservoir engineer, it is important for you to understand the many challenges and options of horizontal drilling.

Who Should Attend
This course is designed for drilling, completion and reservoir engineers, and for service company personnel involved with planning, drilling, completing and operating horizontal wells.

Days: 1  
Level: Intermediate

Hydraulic Fracturing—A Concise Overview

Carl T. Montgomery

This course includes the fundamentals of hydraulic fracturing along with addressing the general process, the terminology, and many of the real-world problems—in a concise format. The overall emphasis is how hydraulic fracturing fits-in with, is impacted by, or impacts geologic concerns, reservoir engineering, and operations. It will provide a general familiarity with fundamentals of the complete hydraulic fracturing process. That is, why it works (or doesn’t), where is it applicable, and what to consider in order to improve.

Topics Include:
- Introduction—What is fracturing?
- Reservoir engineering aspects of fracturing
- What fracturing can do
- What type of fracture you want
- Fracturing

At the end of this course, participants should be able to understand:
- Impact of geologic environment
- Major fracture variables such as creating the fracture you want
- Candidate Selection with discrete “candidate recognition” examples
- Fracturing Materials
- Diagnostics—How you know you’ve achieved your goal

Why You Should Attend
This course will introduce the basic concepts and terminology of hydraulic fracturing, enabling you to intelligently discuss the potential applications to your well. For geologists and geophysicists, it will provide an ability to recognize very early in the evaluation process the potential for fracturing to improve potential target formations, as well as learning what types of formations make the best targets for fracture stimulation.

Who Should Attend
The course is intended for engineering managers, geologists, geophysicists, reservoir engineers desiring general information about the process, and what it can do for them. It is also intended as a general review for petroleum engineers with knowledge or experience in fracturing, but no current active involvement.

Days: 1  
Level: Introductory

Reservoir Description and Dynamics  Projects, Facilities, and Construction  Production and Operations
Hydraulic Fracturing—Design and Treatment

Michael B. Smith, Carl T. Montgomery

This course covers the fundamental principles concerning how hydraulic fracturing treatments can be used to stimulate oil and gas wells. It includes discussions on how to select wells for stimulation, what controls fracture propagation, fracture width, etc., how to develop data sets, and how to calculate fracture dimensions. The course also covers information concerning fracturing fluids, propping agents, and how to design and pump successful fracturing treatments.

Topics Include:
• Rock mechanics/in-situ stress aspects of fracturing
• Reservoir aspects of fracturing (How much fracture do I need?)
• Fracture mechanics
• Fracture design variables
• Perforating for fracturing
• Fracture diagnostics

Why You Should Attend
You will receive a sound engineering approach to fracture treatment design and a thorough analysis of fluid/proppant selection and ancillary fracturing topics.

Who Should Attend
Production and completion engineers and field operations staff with basic to moderate knowledge or experience in designing, pumping or evaluating hydraulic fracture treatments can benefit from this course.

Days: 2
Level: Intermediate

Hydraulic Fracturing Fundamentals for Shale

Steve Hennings

This course covers the technical fundamentals of hydraulic fracture design treatments in shale reservoirs. The primary focus is on actual field results, the practical data needed to plan a treatment, and the reasons treatment designs vary by company and by type of shale reservoir.

Topics Include:
• Shale reservoir characteristics
• Well design and completion basics
• Five Fracture treatment objective
• Hydraulic fracturing mechanics
• Pre-treatment calibration tests
• Fracturing fluid options and applications

At the end of this course, participants should understand:
• Fracturing in horizontal wells
• Completion options and applications
• Quality and safety control issues
• Actual production correlations to changes in fracturing methods
• Treatment monitoring from pressures and micro-seismic
• Cost-Benefit analysis
• Summary of environmental issues

Why You Should Attend
You will receive a sound engineering approach to fracture treatment design and a thorough analysis of fluid/proppant selection and ancillary fracturing topics.

Who Should Attend
Production and completion engineers and field operations staff with basic to moderate knowledge or experience in designing, pumping or evaluating hydraulic fracture treatments can benefit from this course.

Days: 1
Level: Intermediate

Hydraulic Fracturing/Pressure Analysis

Michael B. Smith

This course presents the basics of analyzing fracturing pressure, including design parameters that can be determined, and the uses and limitations of such analysis for on-site design. Sessions include real-world examples from a variety of wells, from tight gas and shale to high permeability, offshore, and frac-pack treatments.

Topics Include:
• In-situ stresses and fracture geometry
• Determining closure pressure and analyzing pressure decline
• The interruption of bottom-hole treating pressure
• Fluid efficiency and the fluid loss coefficient
• Pressure vs. fracture height growth-stress profile
• Scheduling proppant and fluid from pressure-decline data

Why You Should Attend
Although operators have been fracturing reservoirs for decades, recent advances in the technology are having a dramatic effect on the industry. This course will give you a strong foundation for building your knowledge in this important area.

Who Should Attend
This course is for petroleum engineers who are involved, either directly or indirectly, in the design and evaluation of hydraulic fracturing treatments.

Days: 1
Level: Intermediate
Special Requirements: Attendees must bring a laptop to this class. To get the most from this class, participants should have a basic understanding of hydraulic fracturing and well completion concepts.

Drilling and Completions
Health, Safety, Security, Environment, and Social Responsibility
Management and Information
<table>
<thead>
<tr>
<th>COURSE DESCRIPTIONS</th>
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<tr>
<td><strong>In-Situ Recovery Methods and SAGD</strong></td>
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<td>K.C. Yeung</td>
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| Days: 1  
Level: Intermediate  |
| This course will provide a general overview of current and emerging heavy oil recovery methods with emphasis on field experiences in Alberta and steam assisted gravity drainage (SAGD). Participants will learn about the concepts, field development, reservoir performances, applicability, challenges, and issues of the various in-situ recovery methods. Commercial and emerging recovery methods covered:  
- CHOPS, CSS, steamflood, SAGD  
- Steam solvent hybrid  
- Cross-SAGD, fast SAGD, wedge wells  
- VAPEX, N-SOLV, THAI, COGD, ET-DSP, ESEIEH  |
| **Intelligent Well Technology**  |
| Michael Konopczynski |
| Days: 2  
Level: Introductory  
Special Requirements: Attendees must bring a laptop to class.  |
| This course presents the basic knowledge and fundamentals of intelligent well completions needed to identify, plan, and execute smart-well and smart-field projects. Participants will gain an understanding of the petroleum engineering considerations for intelligent well applications such as project screening, well performance modeling and reservoir simulation. They will also learn about the equipment, functionality, completion design and execution needed to successfully implement the project.  |
| **Introduction to Distributed Temperature Sensing (DTS)**  |
| James J. Smolen |
| Days: 1  
Level: Introductory  |
| This course is an introduction to the emerging technology of Distributed Temperature Sensing (DTS), and a historic look at the reasons behind the need for DTS and its usage to date. The course looks at how DTS technology has been applied and the reasons behind applying this technology. Such systems have found application in high-cost horizontal and multilateral wells where reentry with a logging tool is difficult if not impossible. A hands-on demonstration is included in the class.  |

**Why You Should Attend**  
Many advances have been made in in-situ recovery techniques over the past twenty years. Learn more about the current and emerging recovery technologies being developed in order to reduce capital costs, operating costs, and environmental impact.  

**Who Should Attend**  
All E&P personnel, including engineers, geoscientists, technologists, and managers involved or interested in heavy oil recovery methods and field practices will benefit from this course.  

**Why You Should Attend**  
The science behind DTS and its applications are still emerging. If you are looking for ways to improve analysis of well performance, this course is for you.  

**Who Should Attend**  
This course is for petroleum engineers, geologists and anyone else interested in learning more about DTS and the latest advances in the technology.  

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View the current schedule, expanded course descriptions, and register online at [www.spe.org/go/learn](http://www.spe.org/go/learn).
**Introduction to Drilling with Casing Technology**

Ming Zo Tan, Steve Rosenberg

This fundamental course begins with an introduction to the DwC industry, key benefits of the technology, and the primary DwC systems employed by various operators. This is followed by selection of equipment for setting up a competent DwC system comprising of surface casing drive and handling equipment and down-hole components. Various engineering calculations will also be discussed. At the end of the course students will be given an assessment test.

**Topics Include:**
- Drillability analysis, drill bit knowledge
- Bit record and dull grading, basic log interpretation, and drilling exponent
- Casing drill bit and casing drives
- DwC Operations and economics,
- Hydraulics, torque and drag analysis, cementing, and drilling with liner

**Why You Should Attend**
You will gain an understanding of the well selection, economics, pre-job engineering, equipment selection, and preparation needed to ensure the successful execution of a casing while drilling project.

**Who Should Attend**
The course is designed for drilling, application, and field engineers, wellsite supervisors and managers involved in preparation, engineering, and execution of a casing while drilling project.

**Days:** 2  
**Level:** Introductory

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**Introduction to Hydraulic Fracturing**

Khay Kok Lee, Latief Riyanto

This course will provide introductory information on all aspects of knowledge relating to hydraulic fracturing, from the history of fracturing, design, execution, evaluation, and also recent advances in horizontal staged fracturing, which is widely used in unconventional resources like shale gas. Participants will obtain the understanding of design, execution and evaluation process of hydraulic fracturing and knowledge of the critical parameters dictating the success of hydraulic fracturing. The course will also cover the concept and difference between conventional and unconventional fracturing process.

**Topics Include:**
- History and introduction to Hydraulic Fracturing
- Candidate selection
- Frac calculations, Rock Mechanics and Modeling
- Fracturing Fluids Proppant Selection
- Perforations Requirements
- Design Workflow, Design Optimization
- Fracturing in high perm reservoir (TSO design)
- Preparing and executing fracturing jobs
- Fracturing horizontal wells
- Fracturing unconventional reservoirs
- Supervision and quality control
- Mini Frac Analysis
- Post treatment evaluation
- Proppant flowback

**Why You Should Attend**
You will get an introduction of all aspects of hydraulic fracturing and learn about recent advances in horizontal staged fracturing, which is widely used in unconventional resources like shale gas.

**Who Should Attend**
The upstream oil and gas engineers/managers who have not been involved in hydraulic fracturing operations but would like to get some insight on this particular discipline.

**Days:** 2  
**Level:** Introductory

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**Introduction to Managed Pressure Drilling**

Deepak M. Gala

This course provides a solid introduction to Managed Pressure Drilling (MPD), an adaptive drilling process that allows greater control of the annular pressure profile throughout the wellbore. Participants will learn the variables involved in MPD operations, including the selection of the equipment and the various aspects of safety and operations.

**Topics Include:**
- Objectives of MPD and its variations
- Advantages/disadvantages of each MPD variation
- Drilling fluid systems and surface equipment for MPD Operations
- Completing MPD wells
- HSE Issues
- Limitations and costs of MPD
- The future of MPD
- Case histories

**Why You Should Attend**
Managed Pressure Drilling is an increasingly important technique that helps operators drill new wells safely and more efficiently. In some cases, MPD allows them to drill previously undrillable wells. This introductory course is an excellent opportunity to expand your understanding of drilling techniques.

**Who Should Attend**
This course is appropriate for those who are new to the industry, or anyone who would like to understand the value of this important drilling technology.

**Days:** 2  
**Level:** Introductory

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View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
Introduction to Reservoir Engineering

Rob Lavoie, Brian Weatherill

This course is a practical guide to reservoir engineering. It covers the basic principles of reservoir engineering and an introduction to stimulation methods.

Topics Include:
- Reservoir description and decline curve analysis
- Hydrocarbon phase behavior
- Estimating waterflood recovery and forecasting production
- Properties of reservoir rock
- Reserve classifications
- Reservoir drive mechanisms

Why You Should Attend
This course provides expert advice that will bring you quickly up to speed. It is an excellent foundation in reservoir engineering.

Who Should Attend
This course is for engineers and geologists who are relatively new to the industry, but who have some background in reservoir geology and the production of hydrocarbons.

Days: 5
Level: Introductory

Introduction to Underbalanced Drilling

Deepak M. Gala

This course covers the integrated technologies involved in underbalanced drilling. Participants will learn the operation of an underbalanced drilling project and be able to make informed selections of the equipment that is required.

Topics Include:
- Objectives, limitations and advantages of underbalanced drilling
- Selecting the right technique (air, mist, foam, aerated/gasified or single phase)
- Drilling fluid systems and surface equipment for underbalanced drilling
- Reservoir studies
- Completing underbalanced-drilled wells
- Health, safety and environmental issues
- Case studies

Why You Should Attend
With the increased use of advanced drilling technologies such as underbalanced drilling, it is important to understand how to conduct projects that are both successful and safe.

Who Should Attend
The course is designed for all personnel involved in underbalanced drilling, including onshore and offshore managers, wellsite engineers, wellsite supervisors and operations engineers.

Days: 1
Level: Introductory

Introduction to Waterflooding

Rob Lavoie, Brian Weatherill

This course provides a practical understanding of the waterflood recovery process. Participants will learn how to estimate expected recoveries and design new floods, as well as how to monitor and modify existing waterfloods and predict actual recoveries.

Topics Include:
- Review of geological models, and rock and fluid properties
- Review of primary recovery drives
- Waterflood displacement mechanisms and flow recovery
- Waterflood candidate screening and pilot projects
- Water quality and operational considerations
- An analysis of mature waterfloods and case study

Why You Should Attend
This course will give you a solid grounding in waterflooding, a basic tool for secondary oil recovery.

Who Should Attend
This course is for geologists, reservoir and production engineers, technologists and technicians who are involved in planning, monitoring or optimizing oilfield waterfloods.

Days: 3
Level: Introductory

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
Managing Your Business Using PRMS (Petroleum Resources Management System)

John Etherington

This course allows an in-depth look at the framework, classifications and applications of SPE's Petroleum Resources Management System (PRMS). Participants will gain a solid understanding of this valuable resource management tool.

Topics Include:
- An overview and in-depth look at PRMS
- Defining the project and evaluating risk and uncertainty
- Incremental projects and unconventional resources
- Entitlement and recognition
- The resource management processes

At the end of this course, participants should have an understanding of:
- Integrating internal and external reporting
- Combining deterministic and probabilistic methods
- Quality assurance and quality control
- Coordinating international standards

Why You Should Attend
The Petroleum Resources Management System is a powerful management tool that is widely used in the industry. If your job includes any aspect of resource management, this course will enhance your skills.

Who Should Attend
This course is for anyone who works closely with the generating and reporting of reserves, and for those who make resource estimates for business decisions.

Days: 1  
Level: Intermediate

Managing Your Business Using PRMS and SEC Standards

John Etherington, Rawdon Seager

This course is an overview of SPE’s Petroleum Resources Management System (PRMS) and the recently revised US Securities and Exchange Commission (SEC) regulations.

The PRMS is an industry standard approach to classifying petroleum resources. Portfolio managers use it to support their evaluations and decisions. Publicly traded companies listed on US stock exchanges are also obligated to report a portion of their assets according to SEC reserves disclosure rules. Although SEC rules are now more closely aligned with PRMS guidelines, there are important differences. This course compares the key features of PRMS and SEC regulations, and explains how companies may combine the two standards to better manage their business. The use of reliable technology in defining proved reserves limits, SEC supplemental guidance and comparison of SEC and PRMS guidelines will be discussed.

Topics Include:
- PRMS project background
- Major principles and key guidelines in PRMS
- How PRMS captures risk and uncertainty
- Assessing and reporting unconventional resources
- Changes in SEC disclosure requirements
- New pricing requirement
- The concept of “Economic Producibility”
- The use of reliable technology in defining proved reserves limits
- SEC supplemental guidance
- Comparison of SEC and PRMS guidelines
- Reporting requirements and control processes
- PRMS support for resources, project and portfolio management
- Integrating internal business management and external disclosures
- Improving quality assurance in resource evaluations

At the end of this course, participants should have an understanding of:
- Integrating internal and external reporting
- Combining deterministic and probabilistic methods
- Quality assurance and quality control
- Coordinating international standards

Why You Should Attend
It’s critical for resource managers to keep up with the latest regulations. This course can save you days of research and reading on your own.

Who Should Attend
The course is designed for professionals involved in estimating, classifying, and reporting petroleum resources. It is also for those who use reports of petroleum reserves and resources based on SPE’s Petroleum Resources Management System (PRMS), and the recently revised US Securities and Exchange Commission (SEC) regulations. Specific guidance is provided on assessing and reporting quantities designated as unconventional resources.

Days: 1  
Level: Intermediate
Reservoir Description and Dynamics

Projects, Facilities, and Construction

Production and Operations

MODERN PRODUCTION DATA ANALYSIS FOR UNCONVENTIONAL RESERVOIRS

David Anderson

This course provides attendees with a comprehensive methodology for well performance analysis with specific focus on unconventional oil and gas. The approach combines the use of several powerful techniques and will illustrate the practical aspects of production data analysis. Participants are encouraged to bring their own data as time will be allotted to go through their examples as a class.

Depending on interest and time available, examples from Barnett, Bakken, Montney, Horn River, Marcellus, Haynesville, and Eagle Ford plays will be presented.

Why You Should Attend

If you'd like to get more mileage from your production and flowing pressure data, this course is for you.

Who Should Attend

This course is for engineers and technologists involved in exploitation, evaluating reserves, optimizing production or analyzing well tests.

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MODERN WELL DESIGN

Bernt S. Aadnoy

This course presents a unified approach to the well design process. It is an overview of the operational sequences, from spudding the well through drilling and completion, to startup and production. Participants will learn elementary rock mechanics and a simple way to analyze borehole stability. The information is then used to design a fracture gradient curve, which serves as input to the well design process. That is followed by a discussion of the potential for optimization.

Topics Include:

- Methods for improving borehole stability
- High-pressure, high-temperature (HPHT) wells
- Hydraulic optimization and the interpretation of ballooning in deep wells
- Deepwater, multilateral and long-reach wells
- Well integrity issues, with examples from the North Sea

Why You Should Attend

Some of the practical solutions given in the course come from many years’ experience in the North Sea, and are not published elsewhere. Each participant will receive a copy of the book Modern Well Design: Second Edition by Bernt S. Aadnoy.

Who Should Attend

This course is for drilling and production engineers, drilling supervisors, exploration geologists, and others who work on oil and gas wells.

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MODIFIED EOR METHODS FOR BETTER DISPLACEMENT

Birol M.R. Demiral

This course offers an overview of Modern EOR techniques with special emphasis on new ways of enhancements of classical EOR applications for better displacement efficiency. Recent R&D work on new EOR agents will also be discussed.

Topics Include:

- Rock and fluid properties affecting the EOR recovery factor
- Conventional EOR agents
- Water alternating gas injection
- ASP, Chemically enhanced WAG
- Chemically enhanced thermal EOR
- Unconventional EOR methods

Why You Should Attend

Those who are dealing with field development projects that involve EOR applications will benefit from attending this course.

Who Should Attend

This course is intended especially for young reservoir engineers, production engineers, geoscientists, and management personnel.
Monte Carlo Simulation for the Oil and Gas Industry

Susan Peterson

During this course, participants work directly with spreadsheet-based risk simulation software (either Crystal Ball or @Risk) to examine and modify prepared models and to create simple models of their own. Participants will also analyze historical data using histograms, cross plots, correlation in Excel, and software to fit probability distributions to data. Several worksheet models are included. The course covers software basics such as menus, settings, distributions, outputs, graphics, statistics, sensitivity analysis, interpreting results, and creating reports.

Topics Include:
- Monte Carlo simulation and the language of statistics
- Simulation design
- Crystal Ball (or @RISK) features, including inputs, outputs, settings, simulation and reports
- Models to estimate reserves
- Changing distribution types and parameters
- Production and economic forecasts
- Operating and capital expenses
- Cross plots and correlation in Excel
- Handling rare events
- Comprehensive models and linking model components
- Class Problems

Why You Should Attend
With so much uncertainty in our industry, this course helps deal with how to make better business decisions by addressing that uncertainty and risks that occur during projects or planning. It will help better allocate money for budgeting and particularly in a competitive environment as we are today with significant swing in prices and what expectations are. Because of that, it becomes even more important to plan ahead to what the variations and things might be beyond single numbers.

Who Should Attend
This course is intended for engineers, geologists and geophysicists, managers, planners, economists and technical support staff.

Days: 2
Level: Intermediate
Special Requirements: Attendees must bring a laptop to class. You should be familiar with Excel, and models to solve problems, such as production or economic forecasting, estimating reserves or scheduling.

Multiphase Pumping: Fundamentals to Field Applications

Hisham Saadawi

This course is an overview of state-of-the-art multiphase pumping technology. It covers the various aspects of multiphase pumping, from concept to field applications, with emphasis on the practical side.

Topics Include:
- Key process parameters for multiphase pumps
- Classification of multiphase pumping technologies
- Twin screw and helico-axial pumps
- Subsea multiphase pumps
- Mechanical seals
- Project implementation issues

Why You Should Attend
Multiphase pumping is an increasingly important technology for oil field development. If you need to stay on top of this current technology, this course is for you.

Who Should Attend
Petroleum, reservoir, production, facilities engineers, as well as operations and maintenance staff will benefit from this course. It is also for project engineers and managers who are considering the use of multiphase pumps in their projects.

Days: 1
Level: Intermediate

Offshore and Onshore Oil Spill Prevention, Control, and Countermeasures

Emmanuel Wada

This course focuses on oil spill or discharge prevention and response to spill during oil well drilling, production, and work-over operations. Participants will learn about oil spill or discharge prevention, response to spill, spill containment, air and water monitoring, hazard evaluation, and introduction to oil spill trajectory model simulation. Participants will also learn to develop a plan that meets federal and state environmental regulations.

Topics Include:
- Procedure for handling products, facility operations, training, and environmental law
- Transfer operations
- Discharge or drainage prevention
- Overflow, corrosion, vacuum prevention
- Inspection, maintenance, mechanical integrity and leak testing
- Security Measures
- Material of construction for bulk storage containers
- Wellhead pressure control including installation of blowout prevention and control system for drilling operation
- Manifolds and flowlines
- Well shut-in valves

Why You Should Attend
If you are interested in learning more about preventing or reducing the environmental impact of oil spill, you will benefit from attending this course.

Who Should Attend
This course is for engineers, managers, technicians, and consultants responsible for designing and operating offshore and onshore drilling, production, or work-over facilities.

Days: 1
Level: Intermediate
Offshore Pipeline Projects

Stanton D. Marsland

This course is a practical, hands-on work session in offshore pipeline project management, addressing the six key phases of project execution: development, engineering, procurement, construction, pre-commissioning, and start-up/operations. The course maintains a balance between lecture and work session using in-class exercises to demonstrate the relationships between sound practice and application. On the last day, participants will prepare and present development plans using key information learned from the course curriculum.

Why You Should Attend
You will gain an in-depth understanding and broaden your knowledge of offshore pipelines.

Who Should Attend
This course is for pipeline personnel who are or will be responsible for the execution of offshore pipeline projects. Participants should include personnel from operator’s pipeline project teams, design engineering staff, material supplier, and construction contractor personnel. The course is designed to benefit all levels of experience.

Days: 5
Level: Advanced

Oil and Gas Economics and Uncertainty

Rodney Schulz

This course will teach participants how to identify, evaluate, and quantify risk and uncertainty in every day oil and gas economic situations. It reviews the development of pragmatic tools, methods, and understandings for professionals that are applicable to companies of all sizes. The course also briefly reviews statistics, the relationship between risk and return, and hedging and future markets.

Topics Include:
• Strength and weakness of traditional econometric analysis methods
• The efficient market hypothesis and its application to oil and gas price forecasting
• Proven volatility/uncertainty reduction methods and tools for the operational side of business
• How to scientifically and statistically incorporate differing perspectives
• Ways to develop a revenue forecast that takes the uncertainties into account
• Portfolio design and management

Why You Should Attend
This course will help you develop a better understanding of factors that could impact your daily economic decisions as well as establish a new set of applicable tools to use in your professional career.

Who Should Attend
This course is for professionals involved with economic evaluations, forecasting, and economic decisions in the upstream oil and gas business. It is for producers and operators with oilfield experience.

Days: 2
Level: Intermediate

Oil and Gas Reserves: The SEC Reporting Rules

W. John Lee

This course provides substantial detail and interpretation of the US Securities and Exchange Commission’s modernized rules for reporting oil and gas reserves.

Topics Include:
• Discussions on classifying resources
• The SPE/WPC/AAPG/SPEE Petroleum Resources Management System (PRMS), which is the basis for many of the new SEC reserves definitions
• The effects of the new rules on nontraditional resource disclosures
• Recommendations for adapting to the new rules
• Lectures and discussions are included, with more than half of the time devoted to solutions from class problems and exercises.
• The course workbook includes relevant publications of the SEC, SPE, and the Financial Accounting Standards Board.

This course information has been updated to include the latest changes in SEC rules and regulations.

Why You Should Attend
This course will help engineers, geoscientists, and business managers correctly interpret and apply the SEC’s modernized oil and gas reserves reporting rules. It will provide useful comparisons of the SEC rules with the SPE/WPC/AAPG/SPEE/SEG Petroleum Resources Management Systems definitions.

Who Should Attend
Anyone in the petroleum industry who deals with reporting oil and gas reserves will benefit from this course.

Days: 2
Level: Intermediate
Special Requirements: Participants must bring a laptop to class.
Oilfield Data Mining

Shahab D. Mohaghegh

This course examines the successful application of Artificial Intelligence and Data Mining (AI&DM) in the E&P industry in the past several years. It will start with the fundamentals of AI&DM, covering artificial neural networks, evolutionary computing, and fuzzy logic. The course is devoted to field application of this technology with focus on production optimization and recovery enhancement.

Learning Objectives:
• Provide engineers and geoscientists with an alternative (new and innovative) set of tools and techniques to solve E&P related problems
• Identify remaining reserves and sweet spots in reservoirs as a function of time and different field development strategies
• Optimize stimulation and workover design and effectiveness by coupling reservoir characteristics with stimulation practices and forecasting stimulation outcome
• Tap into the hidden and usually unrealized potentials of numerical reservoir simulation models
• Quantify uncertainties associated with geological models and other parameters used in modeling production optimization and recovery enhancement

Why You Should Attend
Artificial Intelligence is a collection of several analytical tools that attempts to mimic life. This technology is used extensively in other industries such as automation, manufacturing, the financial market, and homeland security. It has been predicted that the use of AI technology will introduce a step-change in how E&P industry does business in the future.

Who Should Attend
This course is designed for reservoir, completion and production engineers of operating companies as well as service company personnel involved with planning, completion, and operating wells.

Days: 2
Level: Advanced

Optimizing Existing Waterfloods

Brian Weatherill, Rob Lavoie

This course covers practical methods for analyzing the performance of existing waterfloods and optimizing their technical and economic performance. Geological complexities in the reservoir often become apparent only after a waterflood has been implemented. Other operational factors could also result in performance that is significantly different from what was expected. This course focuses on surveillance methods and corrective measures that can help to optimize a field’s performance.

Topics Include:
• Geological settings
• Characterizing waterflood production response
• Identifying problems
• Computer software applications for waterflood surveillance
• A case study

Why You Should Attend
Although waterfloods are a traditional stimulation technique, they can be tricky. This course provides expert advice that will help you avoid problems and optimize the waterflood performance in the field.

Who Should Attend
This course is for practicing reservoir production and operations engineers, technologists and other professionals who are responsible for managing or operating waterfloods and implementing redevelopment plans.

Days: 2
Level: Intermediate

Optimizing Gas Fields Using Integrated Asset Modeling

Michael H. (Mike) Stein, Luiz C. Amado, S.M. (Sam) Avasthi

This course offers practical, state-of-the-art techniques for optimizing gas field assets. Participants will learn techniques that are based on integrated asset modeling (IAM) through collaboration with an asset team to reach an integrated optimal solution. This course goes beyond standard nodal analysis by incorporating the entire reservoir and facilities. Participants will learn by reviewing case histories; will work on practical and useful problems on their own, then see the instructors’ solutions.

Each participant will receive a workbook of the instructors’ presentations and solutions to the problems.

Why You Should Attend
The biggest advantage of utilizing gas fields through IAM is that the results are consistent with facilities, well, and reservoir constraints and are more realistic. Utilizing this technology helps obtain answers quickly—extremely important for making business investment decisions with limited time. In the future, IAM will be linked to monitoring CO₂ emissions as the effect of fuel consumption on facilities can easily be incorporated.

Who Should Attend
Petroleum, reservoir, production and facilities engineers, as well as asset managers interested in managing and maximizing profitability from gas field assets should attend this course.

Days: 1
Level: Intermediate
Special Requirements: Attendees must bring a laptop; Excel programs will be provided in class.
An Overview of Microseismic Imaging of Hydraulic Fracturing

Kenneth D. Mahrer

This course is a survey of microseismic imaging of hydraulic fracturing. It is designed to give the attendees a rudimentary understanding of this technology based on the science at its foundation, the means and methods by which it is carried out, and the benefits it brings to the users. Since this technology is interdisciplinary, combining geophysics, geology, and geomechanics with well completion technologies, the goal of the course is to give attendees the knowledge and realistic expectations of microseismic imaging of hydraulic fracturing. To this end attendees should expect to become knowledgeable and discerning users, evaluators, and questioners of those vending this technology.

**Topics Include:**
- How it began—colliding disciplines: hydraulic fracturing technology meets pressure-induced microseismicity
- Overview of material science, geomechanics, rock mechanics, fracture mechanics, and geology
- Technology of hydraulic fracture simulations
- In Situ studies of hydraulic fracturing
- Seismology and microseismology
- Microseismic Imaging—it’s how’s and why’s and more than “dots on a page”
- Case studies, FAQs, and misconceptions
- Discussion, Q&A

**Why You Should Attend**
From its beginning, microseismic imaging of hydraulic fracturing has created controversy. It typically shows a flow network much more complicated than the traditional paradigm of a single, vertical, planar, elliptical fracture. This course is designed to give an understanding of the foundation of the “ground truth” from microseismic imaging data, an appreciation for the implementation and benefits of the technology, and an awareness of the strengths and weaknesses of the technology.

**Who Should Attend**
Any oil and gas professional interested in hydraulic fracturing and diagnosis would benefit from this 2-day survey course.

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Petroleum Reserves

John Hodgin

In this course, participants learn to estimate petroleum reserves using SEC and SPE/WPC definitions, guidelines and latest interpretations. Instructors will present the main reservoir engineering and geoscience methods used to estimate reserves, and demonstrate how definitions affect such estimates. Case studies are used to illustrate different methods for estimating reserves, along with typical errors and how to avoid them. Participants will also learn supplemental techniques such as reservoir simulation and probabilistic methods for estimating reserves.

**Topics Include:**
- The purpose of reserves
- Reserves studies, reports, and definitions
- Petroleum fluids
- Resources vs. reserves
- US Reserve Standards
- Reserve classification and status
- Typical problems identified by the SEC
- International reserve standards
- Methods for estimating reserves
- Volumetric method, recovery factors, and reservoir simulation
- Reserve audits, quality control, and SEC hot topics
- The Sarbanes-Oxley Act

**Why You Should Attend**
The rules that govern the way the oil industry reports oil and gas reserves aim to protect investors and ensure energy supplies. If your job includes dealing with SEC and SPE/WPC guidelines, this course offers a quick way to refresh your understanding of the process and learn about the latest changes.

**Who Should Attend**
This course is designed for industry professionals involved in estimating or filing petroleum reserves under SEC or SPE/WPC guidelines, or any oil or gas professionals interested in gaining a better understanding of the process of estimating reserves.

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Practical Application of PRMS (Petroleum Resources Management System)

John Etherington

This course allows an overview and in-depth look at the framework, classifications and applications of SPE’s Petroleum Resources Management System (PRMS). Participants will gain a solid understanding of this valuable resource management tool.

**Topics Include:**
- Defining the project and evaluating risk and uncertainty
- Incremental projects and unconventional resources
- Entitlement and recognition
- The resource management processes
- Integrating internal and external reporting

**At the end of this course, participants should have an understanding of:**
- Resource tracking and reconciliations
- Special classification and categorization issues
- Hybrid deterministic and probabilistic methods—class exercise
- Quality assurance and quality control
- Coordinating international standards

**Why You Should Attend**
PRMS is a powerful management tool that is widely used in the industry. If your job includes any aspect of resource management, this course will enhance your skills.

**Who Should Attend**
This course is for anyone who works closely with the generating and reporting of reserves, and for those who make resource estimates for business decisions.

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[View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.]
Practical Aspects of CO₂ Flooding
EOR

Charles E. (Chuck) Fox, S.M. (Sam) Avasthi, Michael H. (Mike) Stein, J.M. (Jay) Avasthi

This popular course is based on the SPE Monograph Volume 22, *Practical Aspects of CO₂ Flooding*, and is an outgrowth of The University of Texas, the Permian Basin and the SPE CO₂ conferences, and training courses held in Midland, Texas over the past 13 years. The instructors spend most of the time on the practical aspects of CO₂ flooding, keeping the theoretical aspects to a bare minimum. Instructors also discuss the economics of CO₂ flooding compared to waterflooding. If there is enough interest among the participants, there will also be a discussion of CO₂ geosequestration. Practical and useful problems to work on during class will be provided.

**Why You Should Attend**
This course is a great opportunity to learn the practical aspects of CO₂ flooding, hydrocarbon gas flooding or CO₂ sequestration. Practitioners typically include petroleum, reservoir, and production engineers, as well as facilities engineers, managers, and government officials.

**Who Should Attend**
This course is for anyone interested in CO₂ flooding, hydrocarbon gas flooding or CO₂ sequestration. Participants typically include petroleum, reservoir, and production engineers, as well as facilities engineers, managers, and government officials.

**Special Requirements:** Attendees must bring laptops to class; Excel programs are provided.

**Days:** 1  
**Level:** Intermediate

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Practical Aspects of CO₂ Flooding
EOR and CO₂ Geosequestration

Charles E. (Chuck) Fox, S.M. (Sam) Avasthi, Michael H. (Mike) Stein, J.M. (Jay) Avasthi

This 2-day course is a combination of the following popular one-day courses offered by SPE since 2004:
- Practical Aspects of CO₂ Flooding EOR
- Geological Sequestration of CO₂

Almost 400 SPE members and others from around the world who have attended these one-day courses have provided valuable feedback for improvement. In preparing the new course, the instructors considered this feedback and allocated more time and detail to topics of most interest cited by the attendees.

This integrated 2-day course is based on the SPE Monograph Volume 22, *Practical Aspects of CO₂ Flooding*, published in 2002, and is an outgrowth of The University of Texas of the Permian Basin/ SPE CO₂ Conferences and short courses held in Midland, Texas.

Most of the time will be spent discussing the practical aspects of CO₂ flooding, keeping the discussion of the theoretical topics to a minimum, the economics of CO₂ flooding (vis-à-vis water flooding), and CO₂ geosequestration. Practical and useful problems to work on during class will be provided.

**Why You Should Attend**
This course will provide participants the opportunity to review and learn the most up-to-date information available about EOR technologies and strategies practiced today.

**Who Should Attend**
This course is for petroleum, reservoir, production and facilities engineers, as well as managers, government officials and others who are interested in the practical aspects of thermal technologies for recovering heavy oil.

**Special Requirements:** Attendees must bring laptops to class; Excel programs are provided.

**Days:** 2  
**Level:** Intermediate

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Practical Aspects of Thermal EOR

Paul L. Bondor, Ashok K. Singhal, S.M. (Sam) Avasthi

This course focuses on the practical side of Enhanced Oil Recovery (EOR). It presents thermal techniques and strategies, with a minimum of theory. Participants will learn to solve thermal EOR problems, and will receive workbooks with copies of the instructors’ presentations.

**Why You Should Attend**
This course will provide participants the opportunity to review and learn the most up-to-date information available about EOR technologies and strategies practiced today.

**Who Should Attend**
This course is for petroleum, reservoir, production and facilities engineers, as well as managers, government officials and others who are interested in the practical aspects of thermal technologies for recovering heavy oil.

**Special Requirements:** Attendees must bring laptops to class; Excel programs are provided.

**Days:** 1  
**Level:** Introductory
Practical Decline Curve Analysis

Brian Weatherill

This course begins with a brief description of the theory of decline curve analysis and its background. Both type-curve fitting and type curve matching techniques will be explained and demonstrated. The more common type curve fitting methods are demonstrated using examples from fields in western Canada. The class includes a variety of hands-on problems, and exposure to modern computer-based decline analysis tools.

Topics Include:
- Problems and limitations of decline analysis
- Theory and mathematical basis for analyzing decline
- Exponential, harmonic and hyperbolic declines
- Factors affecting decline methods
- Type curve matching (Felkovich curves)
- Examples and problems identifying opportunities using decline curve analysis

Why You Should Attend
If your ability to analyze declining oil and gas production is not what you'd like it to be, this class will give you some powerful new tools.

Who Should Attend
This course should be for all engineers and technologists who use decline curve analysis on a regular basis. It is also popular with other professionals, supervisors and managers who would like a short refresher course and overview of decline analysis methods, uses, misuses and pitfalls.

Days: 2  
Level: Intermediate

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Practical Reservoir Surveillance and Management Techniques for EOR/IOR Projects

Ashok K. Singhal, Paul L. Bondor, S.M. (Sam) Avasthi

This course covers the practical aspects of project surveillance and the impact of reservoir management and surveillance on project economics for both conventional and enhanced oil recovery (EOR) projects. Examples will include problems to be solved in class. Each participant will receive a workbook with copies of the instructors’ presentations and solutions to the class problems.

Why You Should Attend
Reservoir management and surveillance is even more important in EOR projects than they are in conventional operations. This popular course is an excellent opportunity to improve your skills in this important area.

Who Should Attend
This course is for petroleum, reservoir, production and facilities engineers, as well as managers, and other professionals interested in practical reservoir surveillance and management techniques for primary, secondary and tertiary oil recovery.

Days: 1  
Level: Intermediate

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Practical Techniques for Screening Deepwater Offshore Oil and Gas Exploration Prospects

Luiz C. Amado, S.M. (Sam) Avasthi

This course will discuss the practical state-of-the-art techniques of Volume to Value (VV) to help attendees assess exploratory deepwater offshore oil and gas prospects and quantify economic values of the prospects. Attendees will learn how to develop a preliminary field development plan for a given discovery prospect and estimate oil and gas recovery, wells required, and costs. They will also learn how to conduct economic evaluation for lease sales or farm-in opportunities.

Topics Include:
- Volume to value (VV) cycle—from volume to value
- Brief review of volumetrics applied to exploratory prospects
- Application of analogues and its relevance to evaluation of similar opportunities
- Appraisal and field development plan
- Estimating operating and capital costs

Why You Should Attend
Upon completion of this course, attendees should be able to evaluate the commercial potential of original oil and gas in-place in exploratory blocks and develop preliminary field development plans. Attendees should also be able to obtain value of the opportunity in order to make the decision to go ahead and develop the field or walk away from it, as well as identify constraints in terms of geology and engineering that will make it viable or impede the realization of the project.

Who Should Attend
This course is for petroleum, reservoir and production engineers, and geoscientists, economists, managers, and investors as well as government officials interested in screening deepwater offshore oil and gas exploration prospects for lease sales and/or farm-in opportunities should attend this course.

Days: 2  
Level: Intermediate

Special Requirements: Course participants should bring a laptop to the class. Instructors will provide Excel programs.

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Reservoir Description and Dynamics  
Projects, Facilities, and Construction  
Production and Operations
Drilling and Completions

COURSE DESCRIPTIONS

Drilling and Completions

Health, Safety, Security, Environment, and Social Responsibility

Management and Information

Production Decline Analysis—Vertical and Horizontal Wells

Steven W. Poston

Attendees of this course, offered in both 2-day and 3-day versions, will learn the Arps equations, the effects of layering and changing fluid properties on the Arps exponent, and comparing production characteristics of horizontal to vertical wells. Interpretation of performance curves to determine drive mechanisms, recovery efficiency, and effects of operations will also be covered.

Topics Include:
- The utility of the quadratic equation
- The Fetkovich type curve approach
- The Blasingame type curve approach
- The Poe type curve approach for horizontal wells

The participant will become acquainted with the Arps, Fetkovich, Blasingame, and Poe decline curve analysis techniques. Assumptions and limitations of each analysis method are covered. Example and work problems are included to amplify salient points.

Why You Should Attend
You will learn the meanings and limitations of the Arps exponential, hyperbolic, and harmonic equations.

Who Should Attend
Professionals who work in production data processing as it relates to reservoir description and dynamics.

Days: 2 or 3
Level: Intermediate
Special Requirements: Basic math skills are required. Some higher-level math is helpful but all problems can be solved with a spreadsheet.

Production Forecast and Reserves Estimates in Unconventional Resources

W. John Lee

This course is offered in both 1-day and 2-day versions. This course teaches the skills and understanding needed to forecast production and estimate reserves in unconventional (ultra-low permeability) oil and gas reservoirs. The course emphasizes “simple” production decline models appropriate for routine forecasting for hundreds of wells in short periods of time. Both tight oil and gas reservoirs, such as shales resources, are discussed.

Why You Should Attend
There are various ways to forecast production and estimate the size of unconventional gas reservoirs. You’ll learn the strengths and weaknesses of each decline model and how to develop reliable forecasts in this course.

Who Should Attend
The course is for engineers and geoscientists who are interested in learning how to evaluate unconventional reservoirs.

Days: 1 or 2
Level: Introductory
Special Requirements: Attendees must bring a laptop to class.

Production Optimization Using NODAL Analysis

Samson Ibukun

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, multilateral and branches. It will identify 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.

Topics Include:
- Flow from the reservoir to the wellbore
- Flow from Bottom hole to surface and through pipelines
- Complete System Analysis
- Artificial lift Systems

Why You Should Attend
The basic objective of this course is to introduce the concept of NODAL analysis as a tool in production optimization and hence enhancement. Each learner will be exposed to the analysis of various components of the producing system and their effect on the performance of the total production system.

Who Should Attend
Production, operations, and reservoir engineers, production technologists, senior technicians and field supervisors with an engineering background.

Days: 2
Level: Introductory

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
Reservoir Description and Dynamics

Days: 2
Level: Intermediate

Projects, Facilities, and Construction

Days: 1
Level: Introductory

Production and Operations

Days: 2
Level: Intermediate

COURSE DESCRIPTIONS

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.

Reservoir Description and Dynamics

Projects, Facilities, and Construction

Production and Operations
<table>
<thead>
<tr>
<th>COURSE DESCRIPTIONS</th>
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<tbody>
<tr>
<td><strong>Public Outreach and Education: Preparing CCS Professionals for Engaging with Stakeholders</strong></td>
</tr>
<tr>
<td>Lindsey Tollefson</td>
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<tr>
<td>Carbon capture and storage (CSS) project team members will understand and apply effective public education and outreach strategies in selecting, permitting, and operating a carbon sequestration site in this course. Project members will be provided with technical and scientific background, specific guidelines, and best practices for dealing with a variety of stakeholders in a number of different settings.</td>
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<tr>
<td><strong>Topics Include:</strong></td>
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<tr>
<td>• Outreach in CCS case studies from around the world</td>
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<td>• Public outreach and education methods and tools</td>
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<tr>
<td>• Community research</td>
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<tr>
<td>• Development of an outreach strategy and communication plan</td>
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<tr>
<td>• Working within and beyond the regulatory environment</td>
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<tr>
<td>• Getting the message out effectively</td>
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<tr>
<td><strong>Why You Should Attend</strong></td>
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<tr>
<td>This course will bring together the results from the latest CCS research published on public perceptions, outreach, and education best practices.</td>
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<tr>
<td><strong>Who Should Attend</strong></td>
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<td>This course is for oil and gas professionals including executives, managers, regulators and lawyers.</td>
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<td><strong>Days:</strong> 1</td>
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<td><strong>Level:</strong> Advanced</td>
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| **Reservoir Aspects of Horizontal and Multilateral Wells**  |
| Sada Joshi  |
| This course includes discussion on the practical issues and reservoir parameters of horizontal well projects. The topics include formation damage, drainage areas, well spacing, well reserves, and rate calculations using steady-state and pseudo steady-state methods. The course includes several field case histories and performance analysis of horizontal wells.  |
| **Topics Include:**  |
| • Drilling methods and costs  |
| • Well spacing and drainage areas  |
| • Recovery factors and steady-state solutions  |
| • Case histories: coning applications  |
| • Fractured horizontal wells  |
| • Forecasting production  |
| **Why You Should Attend**  |
| While horizontal wells are riskier and more expensive than conventional wells, the production gains may be worth it. This course teaches you when the technology justifies the risk.  |
| **Who Should Attend**  |
| This course is for reservoir, production, drilling, and completion engineers, managers, and other personnel who are interested in learning about selecting reservoirs for horizontal wells and understanding production performance of horizontal wells.  |
| **Days:** 1  |
| **Level:** Intermediate  |

| **Special Requirements:** Attendees must bring a calculator to class.  |

| **Reservoir Characterization: From the Laboratory to the Field**  |
| Larry W. Lake  |
| This course teaches integrated reservoir characterization, from basic petrophysics through geostatistics. The emphasis is on porosity, permeability, capillary pressure and relative permeability as they relate to flow. The course also covers the statistics of the spatial distribution of these properties and illustrates the benefits of using them.  |
| **Topics Include:**  |
| • Single-phase petrophysical porosity, permeability and non-Darcy effects  |
| • Two-phase flow: capillary pressure, relative permeabilities and trapped phase saturations  |
| • Heterogeneity and non-uniformity  |
| • Effective properties: (pseudo) porosity  |
| • Absolute permeability: capillary pressure, relative permeability, dispersivity and viscous fingering  |
| **Why You Should Attend**  |
| This class will quickly bring you up to speed on the characterization of oil and gas reservoirs.  |
| **Who Should Attend**  |
| This course is designed for engineers with at least a bachelor’s degree in petroleum or chemical engineering. All other engineers, geologists, mathematicians and physicists with at least some experience in reservoir engineering or numerical simulation can benefit from the course.  |
| **Days:** 1  |
| **Level:** Introductory  |

| **Drilling and Completions**  |
| Health, Safety, Security, Environment, and Social Responsibility  |
| Management and Information  |

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
Reservoir Description and Dynamics

Projects, Facilities, and Construction

Production and Operations

COURSE DESCRIPTIONS

View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.

Reservoir Description and Dynamics

Days: 2
Level: Intermediate
Special Requirements: Participants are encouraged to bring materials and non-confidential data relating to potential projects.

Projects, Facilities, and Construction

Days: 2
Level: Intermediate
Special Requirements: Attendees must bring a calculator to class.

Production and Operations

Days: 2
Level: Intermediate

Gary Mavko

Rock Physics for Reservoir Characterization and Recovery Monitoring

In this course, applications will focus on seismically detecting variations in lithology, pore fluid types and saturation (oil, water, steam, gases), stress and pore pressure, fractures, and temperature. Participants will discuss case studies and strategies for more effectively employing seismic-to-rock properties transforms in geostatistical methods will also be discussed.

Topics Include:
• Site characterization
• Recovery monitoring
• Upscaling seismic and rock properties from the lab to borehole to reservoir scales
• Rock and fluid factors affecting seismic
• Fluid signatures

At the end of this course participants should have an understanding of:
• Effects of saturation and saturation scale
• Interpreting 4D seismic for reservoir monitoring
• Seismic mapping of porosity and lithology
• Seismic signatures of fractures
• Permeability

Why You Should Attend
Learn the fundamentals of rock physics, ranging from basic laboratory and theoretical results to practical “recipes” that can be applied immediately in the field.

Who Should Attend
This course is designed for geophysicists, reservoir geologists, seismic interpreters, hydrogeologists, and engineers concerned with interpretation of seismic data, reservoir and characterization, hydrocarbon detection, and monitoring of recovery and remediation processes.

Richard G. Hughes, Robert W. Chase

Review for the Principles and Practice Exam (Study Session)

This preparatory study course will share best practices for engineering professionals getting ready to take the professional registration or the SPE certification exam. Questions similar to those found on a typical exam will be reviewed in an effort to raise awareness of exam content. Areas covered include drilling and completions, production logging, economics, reservoir engineering, and formation evaluation.

Course Objectives:
• Participants will be able to strategically approach the study process
• Participants will know of valuable reference materials needed for successful completion of the exam
• Participants will be made aware of general procedures and requirements for registration

Course materials and sample problems are updated each year to remain abreast of changes in the exam. Current test questions will not be reviewed or distributed during this class.

Why You Should Attend
This course can save you valuable time by helping you study in a focused way. By the time you take the exam, you’ll have the confidence of knowing that you are well prepared.

Who Should Attend
This course is for anyone desiring US professional registration.

Dean C. Rietz, Miles R. Palke

Reservoir Simulation for Practical Decision Making

This course covers all the important facets of reservoir modeling, with a considerable amount of the class time reserved for case studies. Previous models conducted by the instructors will also be discussed.

Topics Include:
• Planning a simulation study
• Acquiring and analyzing data
• Fluid properties and rock-fluid interaction
• Developing geologic models
• Constructing grids
• History matching and prediction

Why You Should Attend
By the end of this course, you will better understand how to plan and conduct reservoir studies, and how to review studies conducted by others.

Who Should Attend
This course is for those who want to go beyond the Fundamentals of Reservoir Simulation course. Anyone involved in conducting, reviewing, or overseeing reservoir simulation studies will benefit.
The Science and Technology of Water Treating

John M. Walsh, Ted Frankiewicz

This course provides a fundamental understanding of the science and practical applications of water treating. It presents the fundamental mechanisms behind various water treating equipment and processes, and gives practical experience from dozens of water treating facilities from around the globe.

Throughout the course, field experiences, practical issues, and field performance of equipment is analyzed and explained in terms of surface science, chemistry and engineering principles. The scientific aspects of water treating are presented in a practical down-to-earth manner that can be understood with little prior study, and can be immediately implemented in the field. The full project life cycle is covered from concept selection to front end engineering, detailed design, operation, and trouble shooting.

Topics Include:
- Characterization of oil/water/gas for water treating
- Equipment selection and performance
- Process engineering and process line-ups
- Chemical treating
- Operations, monitoring, and surveillance
- Troubleshooting

Why You Should Attend
Water treating is becoming increasingly important for maintaining the license to operate, as a component of DBBO project delivery, and for developing IOR/EOR projects.

Who Should Attend
The course is intended for process, facilities, and chemical engineers involved in either design or troubleshooting water-treating systems. Both onshore and offshore facilities are presented.

Days: 2
Level: Introductory
Special Requirements: Attendees should have a basic understanding of process, facilities, or chemical engineering.

Screening and Field Piloting for EOR Project Development

Ashok K. Singhal

This course will emphasize critical considerations during enhanced oil recovery (EOR) screening and pilot design. Discussions will include monitoring and surveillance, and EOR project implementation. Appropriate case studies and exercises will be used to illustrate various concepts.

Course Objectives Include:
- Steps involved in EOR project management
- Screening of prospects for different EOR processes
- Field test and laboratory investigations for developing and EOR project
- Development of EOR field pilots and interpretations

At the end of this course, participants should have an understanding of:
- Conceptualizing EOR schemes (gas injection, thermal recovery, and chemical flooding)
- Risks and risk mitigation in EOR
- Screening reservoirs for gas, thermal and chemical EOR
- Reservoir surveillance and monitoring

Why You Should Attend
This course is an excellent way to quickly boost your professional skills and learn from a recognized expert in the field of enhanced oil recovery.

Who Should Attend
This course is intended for petroleum, reservoir, production and facilities engineers, as well as managers and planners who are interested in screening reservoirs being considered for enhanced or improved oil recovery.

Days: 2
Level: Intermediate
Special Requirements: Attendees must bring a laptop to class and relevant EOR related problems for use as in-class exercises.

Screening of Reservoirs for EOR/IOR

Ashok K. Singhal

This workshop examines the rationale and philosophy behind the screening process for Enhanced Oil Recovery (EOR) and Improved Oil Recovery (IOR). Participants will learn to identify the technical and economic factors that determine the feasibility of a given IOR / EOR scheme. Emphasis is on the practical side, with a minimum of theory. Participants will receive a workbook containing copies of the instructor’s presentations and solutions to class problems.

Topics Include:
- Screening of prospects for different EOR processes
- Monitoring and surveillance

At the end of this course, participants should have an understanding of:
- Screening of reservoirs for gas, thermal and chemical EOR
- Risks and risk mitigation in EOR

Why You Should Attend
This course is an excellent way to quickly boost your professional skills and learn from a recognized expert in the field of enhanced oil recovery.

Who Should Attend
This workshop is for petroleum, reservoir, production and facilities engineers, as well as managers and planners who are interested in screening reservoirs being considered for enhanced or improved oil recovery.

Days: 1
Level: Intermediate
Special Requirements: Attendees must bring a laptop to class and their own reservoir data for class discussion.

Drilling and Completions
Health, Safety, Security, Environment, and Social Responsibility
Management and Information
<table>
<thead>
<tr>
<th>COURSE DESCRIPTIONS</th>
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<tbody>
<tr>
<td><strong>Shale Development Fundamentals</strong></td>
<td><strong>Shale Oil and Tight Oil Technologies</strong></td>
<td><strong>Shale Selection, Completions, Fracturing, and Production</strong></td>
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<tr>
<td><strong>Steve Hennings</strong></td>
<td><strong>Steve Hennings</strong></td>
<td><strong>George E. King</strong></td>
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<td>This course covers the status and the engineering and geologic evaluation concepts for shale oil and gas. It focuses on the unique aspects of shale development, compared to conventional oil and gas reservoirs, and the critical unique information that must be gathered to evaluate shale plays. Also included are short class problems on: estimating in-place hydrocarbon volumes, calculating minimum required in-place volumes; and understanding the production impacts of various changes in the geology and well design parameters.</td>
<td>This course is intended for those who are very familiar with reservoir evaluation and development concepts for conventional reservoirs but who are interested in learning more about the unique technologies applied to Shale Oil and Tight Oil. The course learning objectives include: • Understand the key differences between tight oil, shale oil and conventional oil reservoirs • Review the unique test, terminology and work flow associated with unconventional oil reservoirs • Gain insights on the tests and techniques for estimating oil composition and volumes • Understand the techniques for locating and ranking potential development areas • Review the limitations and applications of current engineering and geosciences analysis</td>
<td>This course acquaints participants with the basics of oil and gas shale evaluation and current shale selection, well completion, fracturing, and production technologies for shale reservoirs. The interactive format includes field data, current approaches and use of technologies suited for shale developments. Technologies include logging, frac interval selection, multi-stage fracturing in horizontal wells, and a summary of field data from many shale plays.</td>
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<td><strong>Topics Include:</strong></td>
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<tr>
<td>• Evolution of data analysis and common mistakes</td>
<td>• Candidate selection criteria to identify shale “sweet spots”</td>
<td>• Key technical and environmental issues for fracture treatment design</td>
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<td>• Production forecasting options</td>
<td>• Complex fractures and role of geomechanics</td>
<td>• Key terminology</td>
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<tr>
<td>• Key technical and environmental issues for fracture treatment design</td>
<td>• Well orientation, optimum length and perf cluster design</td>
<td>• Current limitation and evolving applications for seismic, logs and core</td>
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<td>• Basic methods for monitoring, evaluating and refining fracture treatments</td>
<td>• Optimizing well completions and stimulations</td>
<td>• Environmental issues, especially with regard to frac treatments</td>
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<tr>
<td>• Environmental issues, especially with regard to frac treatments</td>
<td>• Fracturing risk estimation: strengths and areas to improve</td>
<td><strong>At the end of this course, participants will:</strong></td>
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<td><strong>At the end of this course, participants should understand:</strong></td>
<td>• Water sources, treatment, reuse and disposal</td>
<td>• Understand how and why well completion and hydraulic fracturing designs continue to evolve</td>
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<tr>
<td>• Unique features and skills of an efficient shale evaluation team</td>
<td>• Predicting production, estimating decline, and water sources, treatment, reuse and disposal</td>
<td>• Review critical issues impacting well productivity, and forecasting, that are often over-looked</td>
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<tr>
<td>• Key terminology</td>
<td>• Optimizing well completions and stimulation operations</td>
<td>• Review the unique development and geologic features of commercially successful plays</td>
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<td>• Current limitation and evolving applications for seismic, logs and core</td>
<td><strong>Who Should Attend</strong></td>
<td><strong>Why You Should Attend</strong></td>
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<td><strong>Why You Should Attend</strong></td>
<td>Recent success in developing oil from very low permeability reservoirs in North America has sparked global interest in how these plays are being identified, evaluated, and developed. This course addresses these issues that require unique approaches, as compared to conventional oil reservoirs, primarily in the areas of well design, log analysis, core analysis, and production forecasting.</td>
<td>The technology for recovering oil and gas reserves from shale is changing the face of the industry worldwide. If shale reserves are part of your portfolio, this course is for you.</td>
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<td>Shale evaluation and development activities impact a wide range of technical professionals who are not directly involved or experienced in well design and field planning for shale development. Gaining a fundamental understanding of these activities, and especially the unique terminology, is beneficial to those who support, guide or evaluate these activities or who are not familiar with the fundamental concepts. Basic concepts covered are currently overlooked by even more experienced technical professionals because most have formal training in only conventional reservoir exploration or development.</td>
<td><strong>Who Should Attend</strong></td>
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<td><strong>Who Should Attend</strong></td>
<td>This course is intended for engineers, geologists, managers, and technical support staff.</td>
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<td>Professionals familiar with the oil and gas development process who are interested in learning the fundamental approaches and terminology for evaluating and developing shale reservoirs.</td>
<td><strong>Days:</strong> 1 or 2</td>
<td><strong>Days:</strong> 1 or 2</td>
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<tr>
<td><strong>Level:</strong> Intermediate</td>
<td><strong>Level:</strong> Intermediate-to-Advanced</td>
<td><strong>Level:</strong> Introductory</td>
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<tr>
<td><strong>Special Requirements:</strong> Participants should have a basic understanding of general engineering and geologic terms.</td>
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View the current schedule, expanded course descriptions, and register online at www.spe.org/go/learn.
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<tr>
<th>Course Title</th>
<th>Instructor</th>
<th>Description</th>
<th>Who Should Attend</th>
<th>Days</th>
<th>Level</th>
<th>Special Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Leadership in the E&amp;P Business</strong></td>
<td>Mason Oghenejobo</td>
<td>This course provides a deep insight into strategic leadership, strategy development and implementation in the E&amp;P business. Systems theory and its applications in strategic thinking and the E&amp;P business are elaborated. The forces driving changes and competition in Nigeria’s oil/gas industry and strategies for sustained success are discussed. Issues and challenges of strategic alliances are reviewed. The development of leaders as stewards in contrast to being agents is emphasized. Socio-cultural and strategic leadership concepts for managing conflicts and change are discussed. Practical examples and cases are used to elucidate issues and solutions. <strong>Topics Include:</strong>  - Systems theory and applications in E&amp;P strategy  - E&amp;P Portfolio management issues and challenges  - Human stimulus and the response model  <strong>At the end of this course, participants should have an understanding of:</strong>  - The competitive landscape of the Nigerian oil and gas industry  - Making strategy work—alignment, integration, focus, leadership at all levels  - Strategic Alliances—issues and challenges, contributors and inhibitors to winning alliances  - Leading strategic change  <strong>Why You Should Attend</strong>  This course is designed and delivered to give participants the capability to address and benefit from the strategic challenges facing the E&amp;P business in Nigeria. Participants are taught how to develop the requisite frames, character and skills that will enable them to lead with positive impact and drive strategic changes to improve personal and organizational performance. <strong>Who Should Attend</strong>  Executives, managers, regulators, planners, bankers, financiers, investors, business owners, technical and commercial professionals in the E&amp;P business who are desirous of enhancing their strategic leadership capabilities to improve personal and organizational performance. <strong>Days:</strong> 2  <strong>Level:</strong> Introductory</td>
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<tr>
<td><strong>Streamline Simulation: Theory and Practice</strong></td>
<td>Akhil Datta-Gupta</td>
<td>This course covers introductory and advanced concepts in streamline simulation and its applications. We will review the theory of streamlines and streamtubes in multi-dimensions. Applications include slow visualization, swept volume calculations, rate allocation and pattern balancing, waterflooding management and optimization, solvent flooding, ranking geostatistical realizations, upscaling/upgridding, history matching and dynamic reservoir characterization. Discussions will include the strengths and limitations of streamline modeling compared with finite difference simulation. PC-Windows based computer programs are used to illustrate the concepts. <strong>Topics Include:</strong>  - Streamlines and streamtubes: fundamentals  - Streamline simulation: state of the art  - Streamline simulation: applications  - Streamline-based history matching  - Advanced topics: fractured reservoirs and compositional models  <strong>Why You Should Attend</strong>  This course is an excellent opportunity to learn the latest technology from a recognized leader in the field. <strong>Who Should Attend</strong>  This course is intended for engineers, geologists and geophysicists interested in rapid fluid flow simulation techniques, screening of geologic models, reservoir characterization and management and history matching of geologic models. <strong>Days:</strong> 5  <strong>Level:</strong> Introductory</td>
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<td><strong>Thermal Reservoir Simulation for SAGD</strong></td>
<td>Mike Carlson</td>
<td>This course covers reservoir simulation theory using the Steam Assisted Gravity Drainage (SAGD) process. It includes a discussion of major engineering concepts such as thief zones, overlying water and gas, and water legs. About one third of the class time is spent on a series of practical examples that give participants hands-on experience using STARS and Exotherm thermal simulation software. <strong>At the end of the week, participants should be able to:</strong>  - Input data and perform thermal reservoir simulations with consistent results  - Discuss basic simulation theory and perform simple heat flow calculations.  - Understand use of K values, viscosity data, stream properties, and reservoir properties such as permeability, relative permeability, operating conditions and controls.  <strong>Why You Should Attend</strong>  This course covers reservoir simulation theory using the Steam Assisted Gravity Drainage (SAGD) process. It includes a discussion of major engineering concepts such as thief zones, overlying water and gas, and water legs. About one third of the class time is spent on a series of practical examples that give participants hands-on experience using STARS and Exotherm thermal simulation software. <strong>Who Should Attend</strong>  The course is for entry-level reservoir engineers, and for geologists and production engineers with some SAGD experience. <strong>Days:</strong> 1  <strong>Level:</strong> Introductory  <strong>Special Requirements:</strong> Attendees must bring a laptop computer if you want to follow along with the software exercises.</td>
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Transient Well Testing

Medhat M. (Med) Kamal

This course is designed to teach state-of-the-art design and interpretation of pressure transient testing through hands-on examples and exercises from oil and gas fields. The course describes the detailed process from well-testing selection and design to data acquisition, validation, and interpretations for different types of reservoirs. Information about the latest developments in pressure transient analysis such as testing under multiphase flow conditions, layered reservoirs, and numerical analysis.

Topics Include:
• Understanding the fundamentals behind all types of well test (DST, Buildup, interference, etc.)
• Learning the reservoir and well properties that may be obtained from various types of tests
• Selecting appropriate testing methods and appropriately design testing procedures to maximize the potential of obtaining required information
• Analyzing data and determining the range of uncertainties of the results

Why You Should Attend
Understand the state-of-the-art of well testing, including testing of vertical and horizontal wells, layered reservoirs, and reservoirs producing under multiphase flow conditions.

Who Should Attend
This course is for production and reservoir engineers and Earth scientists involved in well and formation characterization and reservoir surveillance.

Days: 1
Level: Introductory
Special Requirements: Attendees must bring a laptop to class. Problems will be solved using Saphir software. For those who don’t already have the software, a temporary free download of the software and license will be provided.

Unconventional Reservoir Fundamentals

Steve Hennings

This course provides an introduction to the terminology, design concepts, and status of unconventional reservoir development. The primary focus is on shale development with coverage of key elements of shale that are similar to coalbed methane, tight oil and gas, and even conventional reservoirs. Reviewing these similarities is useful in illustrating the concepts and understanding the reliability of techniques new to shale but have been tested for decades in other types of oil and gas resources.

Topics Include:
• Key events and technologies that sparked unconventional development
• Essential geologic characteristics
• Hydrocarbon processing
• Unique tests and techniques
• Petroleum systems
• Critical log and core analysis

At the end of this course, participants should have an understanding of:
• Drilling and completion options
• Hydraulic fracturing and horizontal drilling basics
• Cost-benefit analysis
• Determining reserves
• Key elements and steps in the development process
• Skills and roles for an effective team
• Environmental issues for hydraulic fracturing

Why You Should Attend
Gain insights on how the volumes, rates, and composition of oil and gas are forecasted and the limitation of the forecasting techniques. Also covered are drilling and completion issues, with a primary focus on the methods applied to shale.

Who Should Attend
This course is intended for those having some familiarity with the oil and gas industry but with little to no exposure to unconventional reservoir evaluation or development technology. The target audience includes engineers, geologists, technicians, sales representatives, investors, managers, government officials, planners, land specialists, and technical support staff.

Days: 1
Level: Introductory

Unconventional Reservoir Production (Rate-Transient) Analysis

Chris Clarkson

This course provides a brief review of the unique properties of unconventional reservoirs and the way they can affect the analysis of production data. Discussions will include pore structure and gas storage mechanisms, material balance, matrix and fracture flow, non-static permeability and multiphase flow.

There will be a review of completion and stimulation methods for unconventional reservoirs. Participants will also see field examples from tight gas, single- and multi-phase shale gas, and single- and multi-phase coalbed methane developments.

Topics Include:
• Cavity completed wells
• Vertical, hydraulically fractured wells
• Horizontal, naturally completed, and multi-lateral wells
• Multi-fractured horizontal wells
• Rate-transient signatures
• Analytical methods for rate-transient analysis
• Modification of pseudo-variables to account for the unique properties of unconventional reservoirs
• Straight-line (flow-regime) methods
• Transient flow (bilinear, linear, elliptical and radial flow)
• Boundary-dominated flow
• Simulation, and some tips on setting up a model, history-matching and integration with rate-transient analysis

Why You Should Attend
Unconventional gas reserves are transforming energy outlooks around the world. If you are part of this important energy trend, you will benefit from this course.

Who Should Attend
Engineers, geologists and managers who are involved in developing or evaluating unconventional gas reserves will gain from this course.

Days: 1
Level: Intermediate
Special Requirements: Participants should have a basic understanding of general engineering and geologic terms.
Understanding Inorganic Scaling—Mechanisms, Control, and Management

Gordon M. Graham

This course is an introduction to inorganic scaling. It includes an overview of the different types of inorganic oilfield scales encountered during production, and the various methods used to control them. Field examples will illustrate the importance of an effective scale management strategy.

**Topics Include:**
- Why scale forms and how to treat it, including both chemical and engineering solutions
- Conventional acid soluble scales (carbonates) and non-acid soluble scales (sulphates as well as other less common scales such as sulphides)
- The chemistry of scale inhibition as well as the benefits and limitations of different chemical inhibitors
- The squeeze process, the mechanisms involved and the various chemical and reservoir factors control the treatment lifetime, as well as other chemical deployment methods such as continuous injection etc.
- Scale removal including both mechanical methods and chemicals methods

**At the end of this course, participants should understand:**
- The influence of initial field design and varying production conditions on the control of inorganic scales
- The use of modeling tools such as scale prediction software, reservoir simulators and near well-bore treatment models
- A technical, economic, and risk-based analysis process for estimating total field scale management costs for new field developments
- Throughout the course extensive reference is made to real field case studies and other published works to illustrate the importance of the various aspects covered.

**Why You Should Attend**
Scaling is one of the most persistent flow assurance issues in the oilfield. Anyone who is involved in the production side of the business should have a basic understanding of the problems of inorganic scale.

**Who Should Attend**
The course is intended for new or practicing production engineers and production chemists involved in scale control and mitigation in oilfield operations.

**Days:** 2  
**Level:** Introductory

Upstream Petroleum Economics—Deterministic Models, Fiscal Regimes, and Stochastic Modeling Tools

Wumi Iledare

This is an interactive two-day course to facilitate good understanding of various kinds of petroleum fiscal arrangements, which govern the international petroleum E&P business. The course examines the fundamentals of and the economic principles underlying petroleum fiscal system analysis and design. The mechanics of estimating the effects of fiscal instruments on total government takes and E&P economics and take statistics are to be discussed with consideration for risk and uncertainty.

**Topics Include:**
- Basic petroleum economics for profitability analysis: deterministic models and applications
- Basic petroleum economics for decision making: capital budgeting and incremental economics
- Fiscal system structure and instruments – general prologue and synopsis
- Arithmetic and mechanics of petroleum fiscal system models and applications, system economic metrics and cast studies
- Diagnosis and analysis of the key fiscal provisions and contract terms in the Nigeria PIB

**At the end of this course, participants should be able to:**
- Understand and apply principles underlying international petroleum economics and commonly used economic tools in petroleum business decisions to analyze the PIB
- Explain the underlying economic and management principles affecting petroleum fiscal system analysis and design
- Understand the mechanics of various kinds of petroleum fiscal systems and the operational aspects of petroleum fiscal instruments and features underlying industry and government relationships.

**Why You Should Attend**
Waterflooding is one of the most basic techniques for secondary recovery, yet conducting the most efficient and effective waterflooding is tricky business.

**Who Should Attend**
This course is for reservoir engineers, geologists, production engineers and asset managers who want to improve their understanding of waterflooding.

**Days:** 2  
**Level:** Introductory

Waterflooding Concepts, Design Prediction, and Optimization

Iraj Ershaghi

This course reviews the characteristics of petroleum reservoirs and ways that injected fluids affect the success of waterfloods. Managing waterfloods is an optimization process. There are opportunities, for example, to improve well placements and completions to better manager voidage and replacement, and to use additives for extending the ultimate recovery. These and other possibilities should be addressed before and during the flood. Hands-on classroom exercises will focus on ways to troubleshoot problems relating to the reservoir, wellbore or surface facilities.

**Topics Include:**
- The various sources of data, measurement techniques, and their cost-effectiveness
- Analyze of the performance of actual waterfloods

**At the end of this course participants should:**
Have learned shortcuts for predicting the effectiveness of waterfloods, and chemical methods for enhancing them.

**Why You Should Attend**
Waterflooding is one of the most basic techniques for secondary recovery, yet conducting the most efficient and effective waterflooding is tricky business.

**Who Should Attend**
This course is for reservoir engineers, geologists, production engineers and asset managers who want to improve their understanding of waterflooding.

**Days:** 1  
**Level:** Intermediate
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| **Waterflooding: Performance Predictions and Surveillance**

**William M. (Bill) Cobb**

This course combines geology, rock and fluid properties, and immiscible displacement theory to develop waterflooding prediction techniques and to aid in the evaluation of actual waterflood performance behavior. Procedures for analyzing oil and water production rates, water injection rates, and recovery efficiency are presented. Impact of primary depletion on waterflood recovery is covered. Selection of waterflood patterns (regular, irregular, peripheral), prediction of sweep efficiency (areal, vertical, and displacement), and an analysis of other variables that control recovery efficiency are discussed in detail.

**Topics Include:**
- Production plots
- Injection profile testing
- WOR analysis
- VRR determination and significance
- Floodable pore volume versus primary depletion pore volume
- Characteristics of an analogue flood

**Why You Should Attend**
Add value to a waterflood injection projects by better identifying and understanding the key reservoir and operation factors impacting a project. Participants will leave the session knowing 'best practices' in waterflooding and when to move forward with a project by taking real world experiences and applying them in the field.

**Who Should Attend**
This course is designed for any production or operations staff, engineer or geologist involved in, or who will soon be involved in, water injection.

**Days:** 5  
**Level:** Intermediate

| **Well Test Analysis and Design**

**M.O. Onyekonwu**

Many operators who run bottom-hole pressure tests (BHP) do not understand what the tests are used for, and the factors that may affect the quality of BHP data. This has often resulted in some tests being invalidated or becoming almost useless to the company it is being run for despite huge sums of money spent on getting the data. The objective of this course is to teach participants the appropriate procedures for BHP surveys and analysis, and the role of each group involved in BHP test.

**Topics Include:**
- Purpose and types of BHP surveys
- BHP survey equipment
- Ideal conditions for running tests and correct procedures for conduction tests
- Field practices and other factors that affect tests
- Examples of good and bad tests

**At the end of this course, participants should be able to:**
- Write a good BHP proposal and detect errors in proposals
- Have a working knowledge of the roles of different parties in the execution of BHP jobs
- Supervise the running of BHP tests
- Demonstrate an understanding of procedures for BHP analysis

**Why You Should Attend**
Add value to bottom-hole pressure surveys. This course is designed for engineers new to well testing. Participants will learn how to perform well testing and interpret the results.

**Who Should Attend**
Wireline operators, BHP survey supervisors, engineers and technicians who need insight into BHP surveys and analysis.

**Days:** 2  
**Level:** Introductory

| **Well Test Interpretation**

**Louis Mattar**

This course examines the fundamentals of well test interpretation for oil and gas wells. It covers the analysis of tests in vertical and horizontal wells: drillstem tests, wireline formation tests, flow/ build-up tests, injection/fall-off tests, interference/pulse test. Determination of permeability and damage, estimation of stabilized flow rates from short tests, detection of boundaries etc. The practice of well test interpretation will be emphasized along with the theory. To this end, Data Validation and the PPD (Primary Pressure Derivative) will be used to illustrate Wellbore Dynamics, and extricate these effects from the reservoir response. The concepts will be presented graphically (using a computer), thus keeping equations to a minimum. The practical aspects of the interpretation process will be highlighted.

**Topics Include:**
- What reservoir information can be derived from a well test
- Understand a well test analysis report
- Recognize that alternative interpretations may be possible
- Derive long term production forecast from a short test
- Recognize strengths and limitations of well test interpretation

**Why You Should Attend**
This is a fundamental course for Engineers new to well testing. This course will show how well testing gives a better understanding of the reservoir and its production performance.

**Who Should Attend**
Reservoir and production engineers

**Days:** 5  
**Level:** Intermediate  
**Special Requirements:** A laptop computer is needed for this course.
**Well Testing—Benefits and Limitations**

Giovanni Da Prat

This comprehensive course covers the full spectrum of well treatment and stimulation options for carbonate and sandstone reservoirs. It begins with a review of the various mechanisms that can damage a formation and ways to avoid them. Next, the discussion turns to acid systems for carbonate and sandstone formations, treatment design the selection of additives, and the use of coiled tubing in extended reach and multilateral wells. The week ends with an introduction to new technologies for carbonate acidizing. Case histories illustrate some of the treatment options.

**Topics Include:**
- What causes formation damage in carbonate reservoirs?
- Acids and additives used in carbonate and sandstone formations
- Candidate selection, job design, and execution
- New technologies

**Why You Should Attend**
In one week, this course will give you the benefit of years of experience, presented by an industry expert and experienced educator. It is also an excellent opportunity to network with colleagues in the field.

**Who Should Attend**
This course is for production, drilling, completion and reservoir engineers who are responsible for enhancing the performance of wells.

**Well Treatment and Stimulation**

H.A. Nasr-El-Din

This course reviews past and current well testing methods. Participants will learn that, although current testing practices may use modern testing equipment and optimized programs and procedures, getting the desired reservoir evaluation in the most economical way often depends on the nature of the formation, fluid properties and the well’s response to the particular testing equipment and field practices. Several field cases are presented to illustrate the benefits of testing and the uncertainties of interpretation.

**Topics Include:**
- Lessons learned from onshore and offshore case histories
- Why, how and when well tests are needed
- Types of tests according to the kind of well completion
- Acquiring pressure and rate data
- Monitoring pressure in real time
- Estimating production rates and pressures
- An introduction to pressure transient analysis for oil and gas wells.

**Why You Should Attend**
There are many variables in well tests that can influence the results. This course will make you aware of the uncertainties behind the data. 

**Who Should Attend**
This course is for petroleum, reservoir and production engineers, as well as geological operations professionals and managers.

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Knowledge transfer from experienced engineers is vital to the future of the petroleum industry. Our instructors are experts in their fields with decades of practical experience, who appreciate the need for training and development of new talent. They incorporate case studies, field examples, workflows, analysis, and problem solving techniques that provide the highest quality of continuing education available.
unconventional plays in North America, including the Bakken, Marcellus, and the Lower Huron.
Burton holds a BS in mechanical engineering from Mississippi State University.

M.R. (Mike) Carlson has a B.App.Sc. in geological engineering from the University of Toronto. He founded Applied Reservoir, a petroleum engineering consulting firm specializing in reservoir engineering, numerical simulation, and economic evaluations in 1999. He has more than 32 years of experience in the petroleum industry, working for such corporations as Amoco Canada, Home Oil, Scientific Software-Intercomp, McDaniel & Associates Consultants, Silverwing Energy, Petro-Canada and RPS Energy Canada. A member of the SPE, APEGGA, CWLS, and the CSPG, he has written over 20 papers and served as technical program committee chairman for the CIPC, SPE Gas Condensate Forum in5 League City, was a director of the National Board of the Petroleum Society of CIM, and was on the Industry Advisory Committee for the University of Regina, Petroleum Engineering. He is the author of Practical Reservoir Simulation, (2003, PennWell).

Currently, he is actively involved in the development of a Team Assisted Gravity Drainage (SAGD) projects in north-eastern Alberta working on caprock in particular. Carlson has taught various courses on various aspects of reservoir engineering, simulation, reservoir management and thermal simulation in Candad, the United States of America, Mexico, South America, Europe, the Middle-East and Asia.

Robert W. Chase is professor and chair of the Department of Petroleum Engineering and Geology at Marietta College and has served in that position since 1978. Prior to this, he served as an assistant professor of petroleum engineering at West Virginia University from 1976 to 1978. He worked previously for Halliburton Services, Gulf Research and Development Company, and the Department of Energy. He has served as a consultant to Columbia Gas, NiSource, Dominion Resources, EQT (formerly Equitable Resources), Cabot Oil and Gas and CONSOL Energy/CNX. He has published numerous technical papers in the areas of natural gas engineering and well testing, but his primary devotion has been to undergraduate petroleum engineering education. Chase was a member of SPE’s Board of Directors from 1991–1994. He has served as chair of the Education and Accreditation Committee of SPE and president of the Association of Heads of US Petroleum Engineering Schools. He served one year as SPE’s representative on the Engineering Accreditation Commission of ABET in addition to serving as a visitor on numerous ABET visiting teams. Chase received his BS, MS, and PhD in petroleum and natural gas engineering from Penn State.

Rajan Chokshi currently works as a director of training and competency for artificial lift and production optimization for Weatherford International located in Houston, Texas. He has over 25 years of experience in the petroleum and software engineering projects globally in the areas of multiphase flow, gas lift, sucker rod pumping, and production optimization. Chokshi holds a PhD in petroleum engineering from the University of Tulsa.

Chris Clarkson, P.Eng., is president of UROC Consulting. He is also a professor in the Department of Geoscience and the EnCana chair in Unconventional Gas Research at the University of Calgary. His research is investigating critical issues of importance to the industry through a comprehensive analysis of unconventional plays in western Canada. A technical paper by Clarkson won the Rossetter W. Raymond (AIME) and Alfred Noble Prize (ASCE) for exceptional merit at SPE’s Annual Technical Conference and Exhibition in 2005. Clarkson also served as a 2009–2010 SPE Distinguished Lecturer. His topic was “Coiled Pipe: What Secrets Remain Hidden in the Black Box.”

Clarkson earned his PhD from the University of British Columbia in 1998.

William M. (Bill) Cobb is a petroleum engineering consultant who specializes in waterflooding, pressure transient analysis, and property management. Cobb has over 30 years of experience in the petroleum industry including research, staff, and district position for Arco Oil and Gas. He has hands-on experience in the design, implementation, surveillance, and management of waterfloods in various areas of North America as well as Australia, Africa, the Middle East, the North Sea, South America, and Southeast Asia. He headed oil and gas operations for Cornell Oil Company, an independent oil and gas company. Cobb was the 2008 president of SPE and served as a member of the SPE Board of Directors for more than seven years. For more than 28 years, he directed a petroleum consulting firm in Dallas.

Cobb received BS and MS degrees from Mississippi State University and a PhD from Stanford University, all in petroleum engineering. He is currently an adjunct professor of petroleum engineering at Texas A&M University.

Kipp Cuddington represents investors in and of conventional and renewable energy projects in the United States and abroad. Considered an expert on carbon capture and storage (CCS), Cuddington led the formation of and is counsel to the North American Carbon Capture & Storage Association. In 2007, he testified before the US Senate Committee on Energy and Natural Resources on CCS long-term stewardship. In early 2010, the State of California invited him to serve on its CCS Review Panel. He is a member of the Interstate Oil & Gas Compact Commission’s CCS Task Force and has assisted on recent CCS-reports issued by the National Coal Council.

Cuddington is a member of the state bars of the District of Columbia and Virginia. He holds a BS in chemical engineering from Purdue University and earned his law degree, magna cum laude, from Georgetown University.

Mark Cook has worked in the oil and gas industry for more than 22 years, the first eleven for Shell International. While at Shell, Cook worked internationally as a reservoir engineer. He is currently managing director of AGR Petroleum Services (TRACS International Consultancy), where he is active in both training and consulting.

Cook’s specialties are reservoir engineering, petroleum economics and risk analysis. He has taught his SPE training course on petroleum economics for more than five years, and during 2002 he was an SPE Distinguished Lecturer on the same topic. Cook holds a BS in chemical engineering from the University of Nottingham.

Giovanni Da Prat is an independent consultant based in Buenos Aires. He has more than 28 years of experience in the oil and gas industry, primarily in well test management, pressure transient analysis and production optimization. Da Prat’s experience includes nine years as district reservoir engineer for Flopetrol-Schlumberger in Bogota, where he interpreted well test data acquired from fields in Colombia, Peru, and Ecuador. Before joining Schlumberger, he spent three years with Halliburton Reserve Services in Caracas as the regional reservoir engineer.

Da Prat has been the author and coauthor of numerous technical articles, and he wrote the book, Well Test Analysis for Fractured Reservoir Evaluation, published by Elsevier in 1990. He was an SPE Distinguished Lecturer in 2003–2004. Da Prat holds an MS in geophysics and a PhD in petroleum engineering, both from Stanford University.

Akhil Datta-Gupta is professor and holder of the LeSuer endowed chair in petroleum engineering at Texas A&M University in College Station, Texas. He has also worked for BP Exploration/Research and for the Lawrence Berkeley National Laboratory. In 2009, Datta-Gupta received the John Franklin Carr Award from SPE for distinguished contribution in the application of engineering principles to petroleum development and recovery. He also received SPE’s 2003 Lester C. Uren Award for significant technical contributions in petroleum reservoir characterization and streamline-based flow simulation. He is an SPE Distinguished Member (2001), Distinguished Lecturer (1999–2000), Distinguished Author (2000), and was selected as Outstanding Technical Editor (1996). Datta-Gupta earned his PhD from the University of Texas at Austin.

Mojdeh Delshad is an associate research professor of petroleum and geosciences engineering at the University of Texas at Austin. Delshad has more than 20 years of work experience in chemical flooding. She has worked extensively on the development and application of reservoir simulators for enhanced oil recovery processes, and is currently in charge of development and user support for the University of Texas’ chemical flooding oil reservoir simulator.

Birol M.R. Demiral is the Schlumberger chair in petroleum engineering at Universiti Teknologi Petronas. Currently he is the research leader of EOR Mission Oriented Research and head of the Centre for EOR at UTP. Previously he had been the chairman of the Petroleum and Natural Gas Engineering Department of Middle East Technical University in Ankara, Turkey where he earned all of his degrees in petroleum engineering mainly on heavy oil recovery and worked for the last 15 years. While working at METU he joined Stanford University Petroleum Research Institute Heavy Oil Group (SUPRI-A) as a post-doctoral research affiliate for a period of four years between 1988 and 1992. He has more than 70 technical papers published and presented. He has been SPE Engineering and Professionalism Committee member since 2008 and a 25-year club member of SPE.

Dennis Dria is president and chief technology advisor for Myden Energy Consulting, has been involved with in-well fiber-optic monitoring since 1999, and well/reservoir monitoring since 1993. His experience includes more than 20 years with Shell in the areas of petrophysics, well and reservoir surveillance, smart field design, development and deployment of fiber-optic monitoring systems, and surveillance data interpretation and integration. He is a 2011–2012 SPE Distinguished Lecturer for “E&P Applications of Fiber-Optic Technologies.”

Dria has a BS in physics and mathematics from Ashland University and a PhD in petroleum engineering from University of Texas at Austin.

Howard Duhon, PE, is a process engineer with over 30 years’ experience in process design and project management roles. He was an engineering manager for GATE LLC in Houston, TX. He is also chairman of an SPE workshop series on Final Commissioning and Initial Startup, a member of the SPE Projects, Facilities, and Construction Technical Advisory Board, and a member of the editorial board of the SPE magazine, Oil and Gas Facilities. His course
is the result of a career-long obsession with the theory and practice of decision-making. He is author of the book, Making Sense and Making Decisions: An Engineer’s Guide to Project Decision Making.

Duhon earned a BS in chemical engineering from the University of Louisiana at Lafayette in 1974.

Hani Elshahawi is currently technology advisor for Shell Upstream Americas Deepwater where he drives the technology portfolio for all existing and upcoming deepwater projects. Previously, he led Shell’s Fluid Evaluation and Sampling Technologies (FEAST) Center of Excellence, responsible for the planning, execution, and analysis of formation testing and fluid sampling operations. He has over 25 years of oil industry experience with both service and operating companies in over ten countries around the world. He has held various positions in interpretation, consulting, operations, marketing, and technology development. He holds several patents and has authored over a hundred technical papers in various areas of petroleum engineering and the geosciences. He is a former SPE Distinguished Lecturer and SPWLA president and Distinguished Lecturer.

Elshahawi received a BS in mechanical engineering from the American University in Cairo and MS in petroleum engineering from the University of Texas.

Peter Erpelding is a consulting engineer for Viking Engineering, where he specializes in the mechanical and thermal analysis of drilling and completion equipment. Erpelding is heavily involved in engineering complex deepwater projects with high pressure, high temperature, and highly corrosive reservoirs. He has conducted numerous software training courses and casing and tubing design seminars. Before joining Viking, Erpelding spent four years with Schlumberger and seven years with OTS. He has an additional seven years of teaching experience in reactor physics, thermodynamics and heat transfer, and has served on the faculty of the US Naval Academy, US Naval Nuclear Power School, and Johns Hopkins University.

Iraj Ershaghi is the Omar B. Milligan professor and director of the petroleum engineering program at USC. He is also serving as the executive director of the Center for Smart Oilfield Technologies at USC. Prior to joining the faculty at USC in 1972, he worked for AGIP-SIRIP, Signal Oil and Gas Company and California State Lands Commission. His areas of research and publications are reservoir characterization, well testing, and improved recovery processes.

Ershaghi is a recipient of numerous awards from SPE including Honorary Member, Distinguished Faculty, Distinguished Member, Western North America Distinguished Service, Technology Transfer Award for Development of the Smart Oilfield Technology Curriculum, and Western Regional North America Reservoir Description and Dynamics. He served as a SPE Distinguished Lecturer during 2006–2007. As a fellow of the Institute for Advancement of Engineering, he received the Outstanding Educator Award of American Association for Advancement of Engineering and the Outstanding Educator Award of Orange County Council of Engineers and Scientists.

Ershaghi is a registered engineer, has a BS degree in petroleum engineering from University of Tehran, and an MS and a PhD in petroleum engineering from University of Southern California.

John Etherington is managing director of PRA International, a Calgary-based consulting firm advising industry on resources assessment, reserves disclosures, and portfolio management processes. Etherington has a B.Sc. and PhD in geology. He spent more than 32 years with Mobil Oil in Canada, the US, and international assignments. Etherington served on the SPE Oil and Gas Reserves Committee with primary responsibility for the 2007 PRMS project. He also coordinated SPE’s interface with the United Nations Framework Classification and the International Accounting Standards Board’s Extractive Activities projects. He was an SPE Distinguished Lecturer in 2005–2006, has presented papers on resource evaluation issues at AAPP, EAGE, and SPE conferences, and has conducted training for more than 950 geoscientists and engineers from 40 countries.

Charles E. (Chuck) Fox is vice president of operations and technology at Kinder Morgan CO2 in Houston, Texas. He currently manages operations of the McElmo Dome CO2 source field and some 1,000 miles of CO2 pipelines. He is also responsible for his company’s oil and gas CO2 EOR operations, including the five billion-barrel Yates field, the three billion-barrel SACROC field, and the Snyder Gasoline Plant.

Fox has written on the practical aspects of CO2 flooding and has taught courses at the annual CO2 conferences held in Midland, Texas. He is a past chairman of the program committee of the SPE/DOE Fourteenth Symposium on Improved Oil Recovery. Fox holds an MS in petroleum engineering from Stanford University and a BS in mechanical engineering from Rice University.

Ted Frankiewicz has more than 30 years of experience with oilfield process systems and produced water treatment. His experience includes hands-on operations, equipment design and manufacturing, and process engineering. He has worked for Occidental Petroleum, Unocal, Natoxo Group, and currently, SPEC Services. There, he designed or diagnosed issues with facilities and water treatment systems internationally for major as well as independent operators. His combined experience in oilfield chemistry, equipment design, and with process systems provides him with unique insights into the issues that challenge operators as their water production and water treatment costs escalate.

Frankiewicz was an SPE Distinguished Lecturer and has traveled extensively to deliver lectures on the treatment of oilfield produced water. He has a PhD in physical chemistry from the University of Chicago, holds 15 patents, and has written more than 35 professional publications.

Deepak M. Gala is SME-well control engineer at Shell Upstream Americas. Prior to joining Shell, he was US commercial manager at Weatherford and US well control engineer at Cudd Well Control.

Outside of his duties at Weatherford, Gala is involved in many industry associations and initiatives with over 15 technical publications. He regularly teaches SPE-sponsored courses and serves on various regional and international SPE committees. Gala was recently selected to be a part of the new SPE Sustainability Committee and SPE International Young Professional Coordinating Committee. He was the first Weatherford employee to receive SPE’s 2008 Outstanding Technical Editor Award for the Drilling and Completion Journal, the first to receive the 2010 International Young Member Outstanding Service Award, and the 2011 Young Engineer of the Year for the SPE Gulf Coast Section.

Gala earned a bachelor’s degree in chemical engineering from Mumbai University, a master’s degree in chemical engineering from Texas A&M University-Kingsville, and an MBA in finance from Tulane University.

Shawket Ghdan is reservoir simulation engineering advisor with CMG. He has more than 22 years of both academic and industrial experience in the area of reservoir engineering, management and modeling. He has authored more than 40 technical papers, and taught many reservoir engineering and reservoir modeling courses worldwide. He holds a B.Sc. in petroleum engineering from the University of Baghdad and ME and PhD degrees in reservoir engineering from Colorado School of Mines. Ghdan is currently involved in a number of SPE activities. He was an SPE Distinguished Lecturer for 2005–2006. He was awarded the 2009 MENA Regional Reservoir Description and Dynamics Technical award, 2010 SPE Outstanding Technical Editor award, and 2011 MENA Regional Distinguished Petroleum Engineering Faculty award.

J. Robert Gochnour is the manager of advanced reservoir simulation development and deployment for BP Exploration and Production Technology (EPT) in Houston, Texas. He is responsible for the development and delivery of new reservoir simulation technology to BP reservoir engineers worldwide. Gochnour has mentored many BP reservoir and petroleum engineers and is extremely active in campus recruiting for specialist engineers. Gochnour earned his BS, MS, and PhD in petroleum and natural gas engineering from Pennsylvania State University. He has been a member of SPE since 1973 and has taught some 200 industry short courses as well as graduate petroleum engineering courses at the University of Pittsburgh, West Virginia University and the University of Houston.

Gochnour has been associated with the research, development, and application of reservoir simulators, reservoir engineering, and production technology throughout his career with Gulf Oil Corporation (9 years), Chevron (6 years), and Scientific Software-Intercorp (2 years), Tigris (5 years) and for the past 15 years with BP.

James (Jim) Gouveia, P.Eng, has a diverse technical, business, and operations background in the petroleum industry. He joined Rose & Associates in 2002 after 21 years with Amoco and BP Energy. Gouveia worked in a variety of technical and managerial assignments in exploration, production and reservoir engineering, strategic and business process planning, and portfolio and risk management. Prior to BP’s acquisition of Amoco in 1999, he was director of risk management for North America. In this role he was accountable for assurance of consistent project evaluation of all major capital projects. He was the recipient of the President’s Award for his work in developing Amoco Canada’s first major fractured tight gas play and the Chairman’s Award for his work in implementing project, risk, and portfolio management processes within Amoco Canada. Following the merger, he functioned as the risk and assurance coordinator for Canada. In his last roles with BP, Gouveia led and managed its strategic initiative into unconventional gas resources in western Canada. He was a member of a worldwide task force focused on growth initiatives in mature basins and on developing a portfolio management process for BP’s unconventional gas assets in North America.

Gouveia has co-authored and presented papers, most recently as a contributing author to the SPE’s 2011 Monograph 3, “Guidelines for the Practical Evaluation of Undeveloped Reserves in Resource Plays,” and SPE 121525, “A Statistical Approach to the Effective Economic Modeling and Portfolio Selection of Unconventional Resource Opportunities,” at EUROPEC. He is a member of APEGGA, SPE, SPE, and AAPG and a partner in Rose & Associates, LLP.

Gouveia earned a B.Sc. in chemical engineering from the University of Toronto.

Gordon M. Graham is the managing director of Scaled Solutions, an independent laboratory in Livingston, UK. Until September 2002, he was a
INSTRUCTOR BIOGRAPHIES

Richard G. Hughes is a professional-in-residence at the Craft & Hawkins Department of Petroleum Engineering (PTE) at Louisiana State University. He earned a BS in petroleum engineering from New Mexico Institute of Mining and Technology and held various production, reservoir and IT positions with Tenneco Oil Company, Dwrights EnergyData and Amerada Hess.

Hughes earned his MS and PhD in petroleum engineering from Stanford University, then joined the University of Oklahoma’s Mewbourne School of Petroleum and Geological Engineering as an assistant professor. His research interests include using CO2 for enhanced oil recovery and carbon sequestration, modeling multiphase flow in porous media and rock fractures, production data analysis, natural gas storage and reservoir engineering of unconventional resources.

Samson Ibuken is a reservoir management consultant with Laser Engineering & Resources Consultant Limited, Port Harcourt.

His interests are in integrated field, reservoir and well optimization with focus on production enhancement, reservoir management and field development. His expertise covers reservoir management, reservoir simulation, Nodal Analysis, material balance analysis, decline curve analysis, type curve analysis, well test analysis, well surveillance and production enhancement amongst others. Ibuken has led the integrated study of many fields in Niger Delta, leading to efficient field development planning. He has also developed and/or facilitated numerous short courses for the oil and gas industry in Nigeria. He holds a B.Sc. (2002) in petroleum engineering from the University of Ibadan, Nigeria.

Wumi Iledare is a professor of Petroleum Economics and Policy Research and a director at the Center for Energy Studies at Louisiana State University, Baton Rouge.

He is an adjunct professor of petroleum economics at the Craft & Hawkins Department of Petroleum Engineering at Louisiana State University and the University of Louisiana, Lafayette. Further, Iledare is a visiting professor of petroleum economics to the Institute of Petroleum Studies (IPS) at the University of Port Harcourt, Nigeria and to the African University of Science and Technology (AUST), Nigeria. Professor Iledare, a Senior Fellow and past president of USAEEN, holds a B.Sc. in petroleum engineering with honors from the University of Ibadan, Nigeria, an MS in energy resources from the University of Pittsburgh’s School of Engineering, and a PhD in mineral economics from West Virginia University. He is also a Distinguished Fellow of the Nigerian Association for Energy Economics (NAEE).

Dilhan Ilk is a reservoir engineer at DeGolyer and MacNaughton in Dallas, Texas. Ilk’s interests include analysis of well test and production data, reservoir engineering, and inverse problems. In particular, he focuses on well performance analysis in unconventional reservoirs and has extensive field experience in well performance assessment of unconventional reservoirs. He has made several contributions to petroleum engineering literature, and to date, has prepared more than 30 articles in well test analysis, analysis/interpretation of production data, and general reservoir engineering.

Ilk holds a BS from Istanbul Technical University, and MS and PhD degrees from Texas AM University—all in petroleum engineering.

Alok Jain is a director of Asset Management Solutions, a training and consulting firm that he formed after taking retirement from ConocoPhilips in late 2003. In his 22 years with Conoco, Jain served in technical and leadership roles in asset management, project management and reservoir engineering. Prior to Conoco, he worked for 11 years in the petroleum industry in Canada, the United States, and Libya in economic evaluation, reservoir engineering and development, and as a reservoir simulation engineer with Gulf Oil Company in Venezuela, Nigeria, and Canada.

Jain holds a BS in chemical engineering from Panjab University, India, a postgraduate diploma in petroleum refining and petrochemicals from the Indian Institute of Petroleum and an M.Sc. in petroleum engineering from the University of Alberta in Canada.

Abul (Jamal) Jamaluddin is NExT business manager for North America and a Schlumberger flow assurance advisor. He has over 22 years of industry experience with operators and the service industry. He joined Schlumberger in 1998 and has worked in business development and operations management in Americas, Middle East and Asia. His assignments included NExT unconventional program director, global flow assurance advisor, reservoir sampling and analysis operations manager for Middle East and Asia, and fluids business development manager for Noar and South America. He earned his PhD from the University of Calgary, Canada in 1990. He is a co-inventor of eight patented processes and co-authored 100+ technical papers. He received three Best Technical Paper awards from GECI and CIME. He is an editor of SPE Production and Operations. He chaired IQPC convergence. SPE Forums and ATWIs. Jamaluddin was named the SPE Distinguished Lecturer for the 2004-2005 season and the SPE Distinguished Member in 2012.

Crefleys Jenkins is with Rose & Associates in Dallas, TX. He was previously with DeGolyer and MacNaughton where he specialized in the characterization. He has conducted integrated studies, resources/reserves work, and training for numerous companies around the world. Jenkins began his career with Tenneco Oil in 1986 as a geological engineer and worked for ARCO from 1988–2000, in various roles as a reservoir engineer, development geologist, and petrophysicist. He has been named a Distinguished Lecturer (2000), Outstanding Technical Editor (2003), and Distinguished Author (2008) by SPE. He is also a past president of the Energy Minerals Division of AAPG and served on the steering committee for the 2010 AAPG Hedberg Research Conference on shales.

Jenkins received an MS in geology and a BS in geological engineering from the South Dakota School of Mines. He is a registered professional engineer and a registered professional geologist in Texas.

Sada Joshi is president and CEO of Joshi Technologies International. He has more than 30 years of experience in horizontal wells and has been advisor to more than 200 field projects around the world. He has written many technical papers and the book, Horizontal Well Technology.

Joshi served as a Distinguished Lecturer for SPE (1995–1996) and was named as “One of the 100 Most Influential People of the Petroleum Century” by Hart Publications in 2000. In 2003, Joshi was named as a Distinguished Alumnus by his alma mater, IIT Bombay, India. He earned his PhD in mechanical engineering from Iowa State University in 1978.

Shah Kabir is a global reservoir engineering advisor at Hess Corporation in Houston, TX. His experience spans more than 30 years in the areas of transient-pressure testing, fluid- and heat-flow modeling in wellsbores, and reservoir engineering. Kabir coauthored the 2002 SPE book Fluid Flow and Heat Transfer in Wellsbores and contributed to the 2009 SPE Monograph Transient Well Testing. Kabir has served on various SPE committees, including the editorial review committees.
Michael Konopczynski is the director of technology at WellDynamics, where he provides petroleum engineering support for the application of SmartWell technology. Before joining WellDynamics in 2001, he spent nearly 20 years with Shell Canada, serving in a variety of production engineering and technology roles including steam-assisted thermal recovery, CO₂ enhanced recovery, deep sour gas development, and gas-condensate developments in Canada, the United States, and the Sultanate of Oman.

Larry W. Lake is a professor in the Department of Petroleum and Geosciences Engineering at the University of Texas at Austin, where he has taught since 1978 and served as department chairman from 1989 to 1997 and again from 2007 to 2009. Lake is a specialist in reservoir engineering and geochemistry. His work in quantifying the effects of geochemical interactions and flow variability for resource recovery is now widely applied by the industry. He has authored four textbooks and more than 100 technical articles and reports. He earned his BS and PhD from Arizona State University and Rice University, respectively. Lake has twice been designated as an SPE Distinguished Lecturer and member of the SPE Board of Directors.

Bill Lane is vice president of Emerging Technologies for Weatherford Artificial Lift Systems. His past roles at Weatherford have included vice presidential positions over the Progressing Cavity Pump Business Unit, the Electromechanical Artificial Lift Systems Engineering, Compression Equipment Engineering and Manufacturing (EVI), and Completion Equipment Manufacturing (EVI). Before joining Weatherford in 1994, Lane managed manufacturing facilities in the US and internationally for Halliburton Energy Services. He was also the general manager of Surface Equipment Engineering and Manufacturing at Otis Engineering. His degrees include a BS in mechanical engineering and an MS in mechanical engineering design, both from the University of Texas at Arlington. Lane has 33 years of oil and gas industry experience.

Rob Laviole is a reservoir engineering associate with RPS Energy, has more than 30 years of oilfield experience. After ten years with Shell Canada, Laviole developed a natural gas supply forecasting application for TCPL (formerly NOVA) during 1992 to 1996. He joined RPS Energy (formerly APA Petroleum Engineering) in 1996. He has extensive experience with enhanced oil recovery (EOR) feasibility and production forecasting. Much of Laviole’s current area of practice involves the use of CO₂ as a miscible flooding agent for EOR and/or the sequestration of CO₂ into saline aquifers. Laviole earned his BS in chemical engineering in 1981.

Khay Kok Lee is a stimulation domain manager for the Asia Region with Schlumberger. He has over 16 years of experience in hydraulic fracturing (land & offshore). He has strong interest in hydraulic fracturing in unconventional and was awarded with American Association of Rock Mechanics (AARM) Original Contribution Award for Master’s Thesis titled “Analyses of Crack Initiation and Propagation Techniques Under Compression.” He is an active member of SPE and an author of multiple technical articles in SPE journals.

W. John Lee holds the Hugh Roy and Lillie Cran Cullen Distinguished University Chair at the University of Houston’s petroleum engineering program. Prior to this, he held the L.F. Peterson Chair in petroleum engineering at Texas A&M University where he is now professor emeritus. He was the former executive vice president of S.A. Holditch & Associates, where he specialized in reservoir engineering for unconventional gas reservoirs. He served as an Academic Engineering Fellow with the US Securities and Exchange Commission (SEC) in Washington during 2007–2008, and was a principal architect of the new SEC rules for reporting oil and gas reserves.

Prior to beginning his career in academia, Lee managed Exxon’s Major Fields Study Group. He has written many technical papers and three SPE textbooks: Well Testing, Gas Reservoir Engineering, and Pressure Transient Testing. Lee is an Honorary Member of SPE and a member of the US National Academy of Engineering. He received his BC, MS, and PhD degrees in chemical engineering from the Georgia Institute of Technology.

Eric Mackay is research fellow at the Heriot-Watt University Institute of Petroleum Engineering, where his research includes the application of reservoir engineering principles and data to better understand production issues. Mackay has written more than 60 publications on scale management. In 2004 he made a keynote presentation at the SPE 6th International Symposium on Oilfield Scale, and was elected program committee chair for the 2006 Symposium.

Mackay is currently responsible for software development, support, and training within the Flow Assurance and Scale joint industry project at Heriot-Watt University, where he has conducted both theoretical and field studies with many of the operating and service companies that support the research. He holds a BS in physics from the University of Edinburgh and a PhD in petroleum engineering from Heriot-Watt University.

Kenneth D. Mahrer is chief scientist at APEX HiPoint building the full picture of a hydraulic fracture stimulation. His career has included a diversity of positions including a member of the team that monitored, mapped, and characterized the microseismicity induced by the world’s deepest, continuous, high-pressure injection well. Prior to APEX HiPoint, Mahrer was a principle geophysicist in the microseismic mapping group at Weatherford.

Mahrer won two postdoctoral fellowships in fracture mechanics at the University of Sheffield and at Northwestern University. He taught geophysics and geology at the University of New Mexico and worked as a principal geophysicist at Teledyne Geotech. He was a technical editor for both the Society of Exploration Geophysicists (SEG) and the Society of Petroleum Engineers. He wrote two columns for the SEG journal The Leading Edge, “The Writer’s Block” on improving technical writing and “Bright Spots” summarizing technical articles appearing in the SEG journal Geophysics. In addition to teaching courses on microseismic imaging of hydraulic fracturing, Mahrer teaches technical writing training courses in universities and companies. Mahrer holds BS and MS degrees in physics and a PhD in geophysics from Stanford University.

Stanton D. Marsland, PE, has 45 years’ experience in project management, project services, and design and construction of worldwide offshore oil exploration and production development projects and operations, with emphasis on offshore and onshore pipeline projects. Having worked for a number of major operating companies, including Shell, ExxonMobil, and Statoil, he has an in-depth knowledge and awareness of the client’s needs and requirements for the successful execution of pipeline transportation systems. Marsland has liaised closely with many of the pipeline industry’s engineering firms, suppliers, contractors, and service companies over the years. He has an appreciation of their unique contractual obligations and commitments as providers of goods and services to the major operating companies.
INSTRUCTOR BIOGRAPHIES

Shahab D. Mohaghegh

is professor of petroleum and natural gas engineering at West Virginia University. He is founder and president of Intelligent Solutions, the leading company in providing the E&P industry with solutions based on artificial intelligence and data mining (AI&DM). With more than 18 years of experience, Mohaghegh has been a pioneer in the application of AI&DM in petroleum engineering, applying hybrid forms of neural networks, genetic algorithms and fuzzy logic to smart wells, smart completions and smart fields as well as to drilling, completion, well stimulation, surface facility optimization, formation evaluation, seismic inversion, reservoir characterization, reservoir simulation, and reservoir management.

He has published more than 100 technical papers during his career and has been a technical editor/reviewer for various SPE journals as well as other petroleum-related publications such as Journal of Petroleum Science and Engineering, Computers & Geosciences, Geophysics, and Energy & Fuels. His technical articles on the application of AI&DM in the E&P industry and development of insights have appeared in the Distinguished Author Series of SPE’s Journal of Petroleum Technology during September, October, and November of 2000 as well as April 2005. He was an SPE Distinguished Lecturer for 2007–2008.

He is the technical review chair for SPE Reservoir Evaluation and Engineering 1997–1999 and 2007 to present. He is the current chair of the SPE Global Training Committee. He has also served as chair, discussion leader, and technical presenter in SPE forums and as a steering committee member in SPE workshops. He has been a panelist in several international conference discussing topics related to AI&DM and smart fields.

Mohaghegh holds BS and MS degrees in natural gas engineering from Texas A&I University and a PhD in petroleum and natural gas engineering from Pennsylvania State University.

Carl T. Montgomery is an engineering consultant for NSI Technologies where his main responsibilities are technical service, engineering development and research in well stimulation and completions. He is recognized within the industry as one of the leaders in all areas of stimulation, including hydraulic fracturing, acid fracturing, matrix stimulation, cavity completions, waste/cuttings injection, rock mechanics and scale prevention/removal. He also has considerable experience in cementing, sand management, conformance control, perforating strategy and formation damage. Formerly, Montgomery was with ConocoPhillips, Arco and Dowell Schlumberger.

Over the course of his career, Montgomery has published more than 30 technical papers and holds numerous US patents. Montgomery served as an SPE Distinguished Lecturer in 1998–1999 and has been presented with awards from private industry and SPE, including SPE Engineer of the Year Award for Drilling and Completions in 2006 and ConocoPhillips Lifetime Achievement Award in 2009.

Montgomery received BS and MS degrees in biochemistry from Colorado State University and Ball State University, and petroleum engineering from Colorado School of Mines.

Hemanta Mukherjee is the principal consultant and president of IPPI, an independent consulting company based in Westminster, Colorado. He has more than 40 years of experience in production and reservoir engineering. Mukherjee retired from Schlumberger Oilfield Services in January 2005, after serving in four product lines and working in many regions of the world. He is also a visiting professor of production engineering for the Imperial College, London where he teaches a master’s level class in petroleum engineering every year.

Mukherjee has written numerous technical papers. He was an SPE Distinguished Lecturer in 1996–1997, and received the SPE Production Engineering Award in 2000. He has been an SPE Distinguished Member since 2004 and has served on many SPE committees. Mukherjee holds a BS in petroleum engineering from the Indian School of Mines in Dhanbad, India, and MS and PhD degrees in petroleum engineering from the University of Tulsa, Oklahoma.

H.A. Nasr-El-Din is a professor in the Department of Petroleum Engineering at Texas A&M University. Prior to joining the faculty at Texas A&M, he was with Saudi Aramco in Saudi Arabia, where he was responsible for all research projects dealing with downhole operations. He has more than 35 years of experience as a academic researcher and a professional in the oil and gas industry. Nasr-El-Din received the SPE Distinguished Member Award in 2007 and SPE’s Production Engineering Award in 2006. He earned his BS and PhD from the University of Cairo, and holds a PhD from the University of Saskatchewan, all in chemical engineering.

Matthew J. O’Brien, P.Eng, has been with Sproule Associates since 1997. He has a B.Sc. and M.Sc. in mechanical engineering. O’Brien’s primary job responsibility is the evaluation of Canadian oil and gas properties, with an emphasis on natural gas properties, especially unconventional gas properties.

David O. Ogbe, PE, is the president and a senior reservoir engineering advisor with Greatland Solutions, in Denver, Colorado, and professor emeritus, University of Alaska. Before joining Greatland Solutions, Ogbe was a lead reservoir engineer with Schlumberger in Denver. He was a professor of petroleum engineering and coordinator of the Coalbed Methane for Rural Energy Research Program at the University of Alaska Fairbanks. Ogbe specializes in oil and gas reservoir engineering, well testing, reservoir simulations, reservoir characterization and formation evaluation, and in large-scale reservoir simulation.

Ogbe earned his BS and MS from Louisiana State University and his PhD from Stanford University, all in petroleum engineering.

Mason Oghenejobo has a B.Sc. in petroleum engineering from the University of Ibadan, Nigeria, an MBA from Webster University, Leiden, Netherlands, Certificate of Professional Development (CPD) with emphasis in business strategy from the Wharton Business School, University of Pennsylvania, Philadelphia, USA, and Certificate of Advanced Graduate Studies (CAGS) in Organizational Leadership from Regent University, Virginia Beach, VA. He has attended management programs at Wharton School, Penn State, Harvard and Stanford Universities. He is also an alumnus of the Lagos Business School Senior Management Program. He has worked with Shell (SPDC) since 1980 in various capacities, which include Area Manager – Land East, GM Commercial and Director of OK LNG.

M. O. Onyewuo is a professor in petroleum engineering, University of Port Harcourt and former Petroleum Technology Development Fund (PTDF) Gas Chair Professor from 2004 to 2009. He received B.Sc. from the University of Ibadan, and M.Sc. and PhD degrees from Stanford University, all in petroleum engineering. He is a registered professional engineer and 2001-2002 Society of Petroleum Engineers Distinguished Lecturer. He won the SPE African Regional award in 2003 and in 2010, also won the African Regional Reservoir Description and Dynamics award. His areas of specialization are well testing, reservoir study and development, gas utilization, technical report writing, formation evaluation, enhanced recovery and computer applications. He is an active member of SPE and COREN registered.

William K. (Bill) Ott is an independent, international petroleum consultant based in both Houston and Singapore. He was an SPE Distinguished Lecturer in 2007–2008, and has conducted technical petroleum industry courses worldwide. He has written numerous technical papers relating to well completions and workovers, and is coauthor of the popular World Oil Modern Sandface Completion Practices Handbook and World Oil Downhole Remediation for Mature Oil & Gas Fields.

Miles R. Palke is a senior petroleum engineer specializing in reservoir simulation, characterization and well-test and material balance analyses. He has more than fourteen years of reservoir engineering experience with heavy emphasis on reservoir simulation studies. Areas of expertise include sector and full-field reservoir modeling, fluid characterization, compositional simulation, coalbed methane recovery, gas storage analysis, nodal analysis, well test analysis and material balance evaluations. Palke has evaluated numerous oil and gas properties around the world. Before joining Ryder Scott, he was a senior staff reservoir engineer and subsurface engineering manager at BHP Billiton for seven years beginning.
in 2002. He also worked at Ryder Scott from 1998 to 2002 as a petroleum engineer in the reservoir simulation group. Palke began his career as a petroleum engineer at Arco E&P Technology in 1996. He has BS and MS in petroleum engineering from Texas A&M University and Stanford University, respectively. Palke is a registered professional engineer in the state of Texas.

**David Palmer** has worked within key oil and gas-industry commercial operations for 20 years, initially for BNOC/Britoil (the UK’s former national oil company), followed by 13 years in central commercial management roles with BP’s upstream division. As a business economist and career commercial specialist, he managed teams and partnership interfaces at the heart of corporate investments, was a leading contributor of developing decision methodology, and managed the full range of commercial skills development programs. Since leaving BP he has maintained industry currency as associate training consultant with TRACS International, building further upon extensive experience with a range of IOC’s and state oil and gas agencies. Palmer has a BA in economics.

**Susan Peterson** has more than 20 years of experience as a consultant, project manager/senior drilling engineer, and an instructor. Peterson specializes in risk analysis and decision-making methods for full field development, and AFE time and cost models. As a consultant, Peterson performs project-specific risk analysis and provides training on decision and risk analysis. She has led a risk analysis and decision methods initiative, and has been responsible for the risk analysis on projects ranging from fast-track remote gas field development to large capital expenditure oil development. She holds PhD and MS degrees from Texas A&M University and a BS from Marietta College, all in petroleum engineering.

**Steven W. Poston** is a professor emeritus at Texas A&M University with over 45 years’ experience in the petroleum industry. His vast career includes reservoir engineering and decline curve analysis, teaching, and consulting in the US, Middle East, Africa, Latin America, and Russia. Poston is a member of SPE and has served on numerous committees including the committee on rewriting the seven-volume Petroleum Engineering Handbook. He co-authored many technical papers and presented over 41 at various university and technical meetings. He is also co-author of Overpressured Gas Reservoirs with Robert R. Berg and Analysis of Production Decline Curves with Bobby D. Poe Jr.

Poston received his B.S.c. and ME degrees in geological engineering and his PhD in petroleum engineering from Texas A&M University.

**Dean C. Rietz**, managing senior vice president and manager of Reservoir Simulation at Ryder Scott, has more than 25 years of diverse experience in evaluating oil and gas reservoirs. He has built a variety of full-field, segmental and field modeling, including black-oil, compositional and thermal formulations. Before joining Ryder Scott in 1995, Rietz taught in-house material-balancing schools at Chevron and the ECLIPSE user’s course while at Inter’s Petroleum Production Division.

Rietz holds a BS in petroleum engineering from the University of Oklahoma and an MS in petroleum engineering from the University of Houston. He has written numerous technical articles and is an adjunct professor at the University of Houston.

**Latief Riyanto** is a staff production technologist in specialized study at PETRONAS. Previously he worked for Total E&P Indonesia as production technologist and well service engineer. During the period, he led hydraulic fracturing campaign for tight gas reservoir in Delta Makaham, Indonesia. In 2009, he joined PETRONAS Carigali (PCSB). As SME, he engineered and supervised PCSB fracturing jobs worldwide e.g.: Oman and Vietnam offshore. He is also PCSB line trainer for in-house hydraulic fracturing course.

He has strong interest in hydraulic fracturing, water shut off and sand control and also an active member of SPE. He is an author for “Selective Water Shut Off in Gas Wells Turns a Liability into an Asset: A Successful Case History from East Kalimantan, Indonesia” and “Remedial Sand Consolidation: Case Study from Makaham Delta, Indonesia.”

**Riyanto** holds an MSc in petroleum engineering from the Institute Francais du Petrole (IFP) and BSc in mechanical engineering from Institut Teknologi Bandung (ITB).

**Steve Rosenberg** is the US region product line manager for Weatherford’s Drilling with Casing division. He has over 25 years of experience in the oil and gas industry, previously holding drilling engineering positions with Diamond Offshore and Conoco. Rosenberg is regarded as a subject-matter expert in casing and liner drilling applications. He has written and coauthored several technical papers on these subjects as well as being a US patent holder (Patent No. 7,857,052 B2, Stage Cementing Methods Used in Casing while Drilling).

Rosenberg holds BS degrees in petroleum engineering from Mississippi State University and in biology from St. Lawrence University, Canton, New York.

**Hisham Saadawi** is vice president (engineering) for Abu Dhabi Company Orshore Oil Operations (ADCO). He has more than 30 years of experience in the design, construction, startup, project management and operation of oil and gas processing facilities. He has worked on numerous multiphase pumping projects and unique applications. They include the world’s first installation of multiphase screw pumps operating in series, the first helicon-axial multiphase pumps operating in series, and the use of a mobile multiphase ram pump and multiphase ESP.

Saadawi has run numerous seminars on multiphase pumping and served on several committees and subcommittees for SPE conferences and workshops. He is an SPE Distinguished Lecturer and currently serves in the Editorial Committee of the SPE Journal of Petroleum Technology. He is a fellow of the Institution of Chemical Engineers and a member of the Institution of Mechanical Engineers. He earned his PhD from the University of Manchester, UK.

**Hemanta Sarma** is currently the chairman and professor of the petroleum engineering program at the Petroleum Institute, Abu Dhabi. He was a professor and holder of the Reg Sprigg Chair in petroleum engineering in Australian School of Petroleum, University of Adelaide. He is an SPE member since 2009 and has primarily worked on gas and reservoir engineering, in both research and field pilots. He holds a BS with honors in petroleum engineering from Indian School of Mines, M.Sc. in chemical engineering, specializing in reservoir engineering from University of Calgary, and a PhD in petroleum engineering from the University of Alberta.

**Rodney Schulz** is formerly from ConocoPhillips where he held a variety of engineering (production/reservoir), financial, and organizational efficiency positions throughout North America over 15 years. Since leaving ConocoPhillips in 2009, Schulz has served as an expert witness on oil and gas asset valuation for a federal bankruptcy court and a major international law firm. In addition to his oil and gas production experience, he has also served as the financial director/CFO for an organization with 150 employees in six states.

In 2003, while still with ConocoPhillips, he started Schulz Financial, a retail investment advisory company that now manages $7 million for 27 households/40 clients and boasts a 98% client retention ratio through a very difficult time for equity markets. Currently, Schulz is putting together several oil and gas field redevelopment deals in south Texas while continuing to grow Schulz Financial and Schulz Consulting.

Schulz has a BS in petroleum engineering from the University of Kansas and an MBA from Duke University’s Fuqua School of Business.

**Rawdon Seager** is currently projects director and chief reservoir engineer for Gaffney Cline and Associates’ (GCA’s) western hemisphere headquarters in Houston, Texas. Seager’s main responsibilities include internal quality assurance for technical projects and providing clients with advice regarding reserve and resource evaluation and reporting. He has also provided expert testimony at international arbitrations. Seager has spoken at various industry events as well as presenting in-house and public courses to clients on estimating, classifying and reporting of reserves. Seager began his career in 1972 as a petroleum engineer with Shell International in Malaysia with later assignments in Brunei, the Netherlands, and Australia. In 1980 he joined Roy M. Huffington in Indonesia where he became petroleum engineering manager before joining GCA in 1985 with whom he has held senior positions in the United Kingdom, Singapore, Argentina, Venezuela and the USA. He has a BS in physics from Bristol University, England and an MS in petroleum engineering from Imperial College, London.

**Bill Shroyer**, managing director of EXIUS LLC, has worked in the practical application of DTS systems in the oil and gas market since 1998. During this time, he has designed and executed numerous fiber-optic DTS as well as conventional monitoring installations in a wide variety of applications ranging from complex offshore installations to shallow steam flood fiber deployments. Over the last 14 years, Shroyer has served in field and project engineering roles for two major service companies and provided project management consultation for a major global operator.

Shroyer has a degree in electronics engineering from the University of East Carolina and is a Certified Fiber Optic Technician (CFOT).

**Peter C. Sidey**, P.Eng., has been with Sproule Associates since 1997. He has a B.Sc. in mechanical engineering from University of Calgary, Sidey’s primary job responsibility is the evaluation of Canadian oil and gas properties, with an emphasis on the application of probabilistic evaluation techniques.

**Ashok K. Singhal**, an expert in EOR technologies and horizontal well applications, is a principal consultant with Premier Reservoir Engineering Services, where he provides consulting and training in EOR. He has more than 35 years of worldwide oil and gas experience in horizontal and tar sand reservoir engineering, horizontal well technology, CO2 flooding, thermal EOR, and waterflood projects. He has lectured on EOR, horizontal well applications and other topics around the world.

Singhal is an engineering alumnus of Indian School of Mines and the University of Alberta, Edmonton. He earned his PhD in petroleum engineering from the University of California and later taught chemical engineering at the Indian Institute of Technology and petroleum engineering at the University of Alberta.

**Cameron P. Six**, P.Eng., has been with Sproule Associates since 2004. He has a B.Sc. in chemical engineering from the University of Calgary. Six’s primary job responsibility is the evaluation of Canadian oil and gas properties, with an emphasis on emerging trends.
Ed Smalley has more than 30 years of oilfield experience, including assignments in new product development, field operations, sales, and management. His areas of expertise include coiled tubing, formation evaluation, coiled methane, hydraulic fracturing, and commercialization of emerging technology.

He started his career with Schlumberger where he held various positions of increasing responsibility in sales and operations. He then joined Gas Technology Institute as Director of E&P Business Development, where he spearheaded the commercial launch of more than 60 new E&P products.

Smalley has been with NOV CTES in Conroe, TX, for the past 9 years and serves as General Manager, responsible for the overall management of the organization. NOV CTES is a provider of leading-edge devices that support the coiled tubing, wireline, and drilling segments of the industry. Smalley holds a BS degree in chemical engineering from Kansas State University and has published numerous SPE papers. He is an active member of SPE, ICOta, and SPWLA.

Michael B. Smith is president and founder of NSI Technologies, a consulting firm in Tulsa, Oklahoma. He has more than 20 years of experience in rock mechanics, well completions, and hydraulic fracturing. Smith has written more than 35 technical papers and holds six patents. He also served as an SPE Distinguished Lecturer and wrote two chapters in the SPE Monograph, Recent Advances in Hydraulic Fracturing. Smith recently received the Lester C. Uren Award for his technical contributions to hydraulic fracturing.

James J. Smolen has more than 30 years of experience in cased hole well logging, applications, related research, and training. He began in the oil industry in 1970 with Schlumberger and since 1980, has been an officer and director of Petroleum Computing, as well as an international consultant and trainer. He has numerous publications to his credit, including the 1996 PennWell text, Cased Hole and Production Log Evaluation. Smolen was a Distinguished Lecturer for SPE and SPWLA. He holds a BS from Northwestern University, and earned his MS and PhD degrees from the University of California, Berkeley.

Ken Sorbie is a professor at Heriot-Watt University's Institute of Petroleum Engineering. He has a first degree in chemistry from Strathclyde University and a PhD in theoretical chemistry and applied mathematics from the University of Sussex. He has worked in oil-related research for more than 20 years, first with the Department of Energy Laboratory at AEE Winfrith and, since 1988, at Heriot-Watt University. Sorbie is currently a principle investigator, along with Anne Neville and Eric Mackay, of the Flow Assurance and Scale Team joint industry project, which he launched in 1989.

Sorbie has published more than 200 technical papers on his research and a book on polymer flooding. He was an SPE Distinguished Lecturer in 2000–2001 and is a member of the Royal Society of Edinburgh.

Michael H. (Mike) Stein retired from BP in 2006 after 28 years of service, and is now a consultant specializing in enhanced oil recovery and integrated asset modeling. Stein was a team leader of the Integrated Asset Modeling group in BP's Technology Center in Houston. He also directed research on ways to apply integrated asset modeling to more offshore production in real time, and to couple integrated asset modeling with reservoir simulation. Stein holds three US Patents, two in enhanced coal bed methane (ECBM) production, and one in automatic freshwater history matching.

He is a long-standing member of SPE, has served on SPE editorial committees, and chaired SPE Reservoir Engineering committee to select papers for SPE's Annual Technology Conference and Exhibition. Stein holds a BS in chemical engineering from the University of Missouri, and MS and PhD degrees in chemical engineering from Purdue University.

Nora T. Stewart, P.Eng., has been with Sproule Associates since 1989. Stewart's primary job responsibility is the evaluation of Canadian oil and gas properties, with an emphasis on the development of pricing models.

Ming Ze Tan is the global application engineering manager for Weatherford Drilling with Casing product line. He joined Weatherford in 2003 as a Dcw product line manager. Recently, he focuses on nurturing application engineering teams in various geographical regions besides being actively involved in the development of new products and engineering tools. Prior to Weatherford, he held various positions within Halliburton, being a drill bit optimization engineer, bit designer, and rock strength specialist. He has 15 years of oilfield experience.

Tan holds a BS degree in petroleum engineering, coauthored several technical papers, and is a co-owner of a US patent.

F. Brent Thomas directs phase behavior and EOR research at Weatherford Labs in Calgary, where he has worked in various capacities since 1981. His focus includes numerical analysis, phase behavior and phase interference in porous media, gas injection, asphaltene precipitation, and chemical and thermal recovery. Thomas has written or coauthored more than 130 technical papers. He received the 1992 Best Technical Paper of the Year Award from CIM and coauthored the 1995 best technical paper for the Journal of Canadian Petroleum Technology. He was selected as a Distinguished Author for the Petroleum Society of CIM in 1995 and 1998, and was a Distinguished Lecturer for SPE International in 2003–2004.

Thomas obtained his B.S.c. and M.Sc. at the University of Calgary and his PhD from Washington University in St. Louis, all in chemical engineering.

Lindsey Tollefson is the founder of Leverich Solutions, a firm that specializes in public involvement, communication, and facilitation services for water, energy, environmental, and community projects. She also serves as the outreach and communications manager for the Big Sky Carbon Sequestration Partnership at Montana State University. Tollefson has given numerous presentations on a wide variety of topics at conferences, universities, and workshops around the nation. Her audience includes policymakers, stakeholders, civic groups, and the public.

Tollefson has a BS in biological sciences from Montana State University and an MS in environmental science from Florida International University.

Emmanuel Wada is a chemical engineer with more than 19 years of experience in design and integrity assessments as well as hazard operation analysis procedures. He also has experience in air and water pollution control, wastewater treatment, oil spill prevention, hazardous waste management, risk assessment, emission inventory, superfund sites clean up, pollution prevention, the development of control and countermeasure (SPCC) plans as well as Phase 1 and 2 environmental assessment. He has supervised many projects in chemical plants and refineries using operational excellence management systems (OEMS) to assess mechanical integrity, safety standards, and regulatory compliance.

Wada has used his experience and knowledge to train engineers and scientists in topics which include safety analysis, air pollution control equipment design, oil spill prevention, permitting, environmental and safety risk assessment, environmental safety, health regulations, and hazardous waste management. In addition, he has also managed Tax Relief for Pollution Control Program for the Texas Commission on Environmental Quality.

Wada obtained his PhD from Louisiana State University, Baton Rouge, Louisiana and his BS and MS in chemical engineering from University of Louisiana, Lafayette, Louisiana. He is a licensed Professional Engineer in Texas and Louisiana.

John M. Walsh is a consultant, currently working for GHD, an engineering and consultancy company specializing in water treatment. He recently retired from Shell where he was the global subject matter expert in the area of upstream water treatment. He has more than 20 years experience in the E&P industry, having worked in the Shell technical centers for half of his career and in operating assets for the other half. He has designed water-treating systems, and provided troubleshooting support to assets all over the world. He has experience in nearly all areas of water treating for the oil and gas industry including conventional produced water treating systems, and water treating for water flood, polymer flood, steam flood, sour hydrocarbons, and unconventional hydrocarbons.

Having earned a PhD in chemical engineering, together with extensive experience in operating units, he brings a unique combination of fundamental knowledge with first hand practical experience. He has presented more than 40 papers on the subject of produced water treating at various conferences and workshops. He currently serves on the Board of Directors of SPE as the technical director for the Projects, Facilities, and Construction discipline.

Brian Weatherill, P.Eng., is a petroleum engineering specialist with APA Petroleum Engineering with more than 30 years of oilfield experience. Prior to becoming a consultant in 1998, Weatherill spent over 20 years with Shell Canada where he gained extensive experience in petroleum engineering, enhanced oil recovery, petroleum technology management and project management. Weatherill has also managed well stimulation operations for a privately-owned Canadian company.

K.C. Yeung, MS, P.Eng., is director of Oil Sands Technology at Dover Operating Corporation in Calgary, Alberta, Canada. He has worked in the heavy oil industry for over 36 years, primarily in the area of reservoir development. He has been involved in various in-situ field projects including cyclic steam stimulation (CSS), steamflood, in-situ combustion, cold heavy oil production with sand (CHOPS), and steam assisted gravity drainage (SAGD).

Yeung was a Distinguished Lecturer for the Petroleum Society of CIM. He has given lectures and training courses on heavy oil recovery and SAGD in Canada, China, South America, and Middle East to promote Canada's in-situ heavy oil technology. He was also a member of the evaluation committee on the SPE Reprint Series No. 61, Heavy Oil Recovery.

Yeung was the 2005–2006 president of the Canadian Heavy Oil Association (CHOA) and the 2007 chairman of the Petroleum Society of CIM. In 2009, he received the Lifetime Achievement Award from the Petroleum Society of Canada.
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