PetroSkills® part of RelyOn

PetroSkills.com

2026 UPSTREAM

Instructor Led Training and Development Guide

Worldwide Energy Training

Industry Driven. Industry Approved.

With a complete spectrum of solutions, courses and learning tools, PetroSkills is developing competent petroleum professionals in all technical processes, spanning the industry's entire value chain, worldwide. PetroSkills' services and solutions connect learning to the workplace, allowing employers to manage and assure the competence of workers at every level.

eLearning Solutions

For Engineers and Professionals

The Competency Alliance's eLearning solutions combine industry knowledge, expertise, content, and technology to develop workforce competency. Online learning accelerates time to competency while eliminating travel expenses.

petroskills.com/solutions/elearning-petroacademy

For Operations and Maintenance

Comprehensive eLearning courses in Health, Safety, and Environment (HSE) and technical skills. Our expertly designed programs ensure your team is well-equipped to meet stringent compliance standards. Invest in knowledge and build a resilient, informed workforce.

petroskills.com/solutions/epilot-elearning-libraries

In-Person Solutions

In-House Training

In-house courses are private, on-site classes taught wherever, whenever and however you want. Offering a cost-effective solution by bringing our courses to your site or to any convenient location you choose.

petroskills.com/solutions/in-house-training

Public Courses

We conduct more than 1,000 public course sessions each year, in every oil and gas producing region. Wherever you are located, PetroSkills courses are available frequently and conveniently to lower total cost.

petroskills.com/training?vf-mode=sessions

Console Operator Simulator Training

From Simulation Solutions, Inc.

Our Hands On Training System contains a broad range of high fidelity process models and realistic DCS system emulations which have been integrated into a network based, fully automated training system that includes detailed training exercises, comprehensive on-line help, self and graded evaluations, and the recording of test scores and results.

petroskills.com/solutions/console-operator-training

PetroSkills Ability™

Learning Management to drive competency and move your business forward.

To be effective, Learning and Development must not only manage employee capabilities—but must also do so in a way that supports key business goals. Ability™ is designed to make these L&D challenges easier. It is a tool we created by combining a powerful learning and compliance management engine with a competency development and assurance engine. Our experience with compliance and competency is broad. We have more than 30 years' history of innovating L&D technologies, and we have been delivering learning and compliance solutions worldwide to the most heavily-regulated industries for over 50 years.

petroskills.com/solutions/ability

Performance Consulting

Combining business, technical, and learning expertise to improve operations.

PetroSkills Performance Consulting Services can help you understand how to achieve sustainable competency management. We use a proven four-phase methodology to guide a Performance Consulting project, relying on the knowledge and assets developed through the PetroSkills Alliance for guidance. To support better business results PetroSkills Performance Consulting Services combines proven resources, including:

- Petroleum industry business experts
- Highly experienced technical experts
- Comprehensive learning resources

petroskills.com/solutions/performance-consulting

PetroSkills® part of RelyOn

We help individuals and companies in the oil and gas industry identify skill and knowledge gaps, give them the tools they need to fill those gaps, and equip them to do their jobs safely, efficiently, and profitably.

To learn more visit petroskills.com

Industry-leading competency-based training available online & in-classroom.

Upstream Training for the Energy Industry

Driven by the growth of unconventional oil and gas activity and an evolving resource base, the industry has witnessed increasing capital investments toward oil and gas exploration and production. To succeed in this ever-changing environment, the upstream segment must rapidly expand capabilities and accelerate the development of its workforce.

PetroSkills part of RelyOn

The courses listed within this catalog are arranged by Discipline and then Level.
The Disciplines have been color coded for ease of locating.
For more information on Courses, please contact us or visit PetroSkills.com.

Upstream Courses

Multi-Discipline Training

7	Basic	Basic Drilling, Completion and Workover Operations - BDC
7	Basic	Basic Petroleum Engineering Practices - BE
7	Basic	Basic Petroleum Technology - BPT
7	Basic	Overview of the Petroleum Industry - OVP
8	Foundation	Evaluating and Developing Shale Resources - SRE
8	Foundation	Operations Crew Resource Management - OCRM

Data Management, Science and Analytics

8	Foundation	Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications - IMLD

Energy Business

8	Basic	Basic Petroleum Economics - BEC
9	Basic	Essential Leadership Skills for Technical Professionals - OM23
9	Basic	Essential Technical Writing Skills - ETWS
9	Basic	Negotiation Skills for the Petroleum Industry - NSPI
9	Basic	Technical Writing for Oil and Gas Professionals
10	Foundation	Contracts and Tenders Fundamentals - SC-41
10	Foundation	Cost Management - CM
10	Foundation	Economic Evaluation of Prospects and Producing Properties - EPP
10	Foundation	Economics of Worldwide Petroleum Production - EWP
11	Foundation	Effective Materials Management - SC-42
11	Foundation	Managing and Leading Others - MLO
11	Foundation	Meeting Management and Facilitation for the Petroleum Industry - MMF
11	Foundation	Petroleum Finance and Accounting Principles - PFA
12	Foundation	Petroleum Risk and Decision Analysis - PRD
12	Foundation	Presentation Skills for the Petroleum Industry – PSPI

Energy Business continued

12	Intermediate	Cost/Price Analysis and Total Cost Concepts in Supply Management - SC-64
12	Intermediate	Inside Procurement in Oil and Gas - SC-61
13	Intermediate	International Petroleum Contracts - IPC
13	Intermediate	Making Change Happen: People and Process - MCPP
13	Intermediate	Strategic Procurement and Supply Management in the Oil and Gas Industry - SC-62
13	Intermediate	Supplier Relationship Management - SC-63
14	Specialized	Advanced Decision Analysis with Portfolio and Project Modeling - ADA

Geology

14	Basic	Basic Petroleum Geology - BG
14	Foundation	Computer-Based Subsurface Mapping - CSM
14	Foundation	Geochemistry: Tools for Effective Exploration and Development - MGT
15	Foundation	Horizontal Well Placement and Geosteering - HWP
15	Foundation	Mapping Subsurface Structures - MSS
15	Foundation	Sandstone Reservoirs - SR
15	Foundation	Sequence Stratigraphy: An Applied Workshop - SQS
16	Foundation	Structural Styles in Petroleum Exploration - ST
16	Intermediate	Analysis of Structural Traps in Extensional Settings - ESS
16	Intermediate	Basin Analysis Workshop: An Integrated Approach to the Exploration and Evaluation of Conventional and Unconventional Resources - BA
16	Intermediate	Compressional and Transpressional Structural Styles - CPST
17	Intermediate	Deep-water Turbidite Depositional Systems and Reservoirs - DWT
17	Intermediate	Development Geology - DG
17	Intermediate	Geochemical Techniques for Solving Reservoir Management and Field Development Problems - GTS
17	Intermediate	Operations Geology - OG
18	Intermediate	Prospect and Play Assessment - PPA

Geophysics

18	Basic	Basic Geophysics - BGP
18	Foundation	Seismic Imaging of Subsurface Geology - SSD
18	Foundation	Seismic Interpretation - SI1
19	Foundation	Seismic Velocities and Depth Conversion - SVDC
19	Intermediate	AVOI Predicting Reservoir Characteristics with Pre-stack Seismic Amplitude Analysis & Inversion - AVOI
19	Specialized	3D Seismic Attributes for Reservoir Characterization - SARC
19	Specialized	Advanced Seismic Stratigraphy: A Sequence-Wavelet Analysis Exploration-Exploitation Workshop - ADS
20	Specialized	Applied Seismic Anisotropy for Fractured Reservoir Characterization - ASAF
20	Specialized	Use of Full Azimuth Seismic and Microseismic for Unconventional Plays - FAMS

PetroSkills part of RelyOn

Petrophysics

20	Foundation	Coring and Core Analysis - CCA
20	Foundation	Foundations of Petrophysics - FPP
21	Foundation	Geomechanics for Heavy Oil - HOGM
21	Foundation	Introduction to Geomechanics for Unconventional Reservoirs - IGUR
21	Foundation	Mud Logging - MDLG
21	Foundation	Well Log Interpretation - WLI
22	Intermediate	Capillarity in Rocks - CIR
22	Intermediate	Integration of Rocks, Log and Test Data - ILC
22	Intermediate	Nuclear Magnetic Resonance (NMR) Petrophysics - NMRP
22	Intermediate	Petrophysics of Unconventional Reservoirs - PUR
23	Intermediate	Shaly Sand Petrophysics - APS
23	Specialized	Applied Rock Mechanics - ARM
23	Specialized	Cased Hole Formation Evaluation - CH
23	Specialized	Wireline Formation Testing and Interpretation - WFT

Production and Completions Engineering

24	Basic	Surface Production Operations - PO3
24	Basic	Well Stimulation: Practical and Applied - WS
24	Foundation	Artificial Lift Systems - ALS
24	Foundation	Completions and Workovers - CAW
25	Foundation	Downhole Remediation Practices for Mature Oil and Gas Wells - DRP
25	Foundation	Operations and Development of Surface Production Systems - PO4
25	Foundation	Performance Analysis, Prediction, and Optimization Using Nodal Analysis - PO2
25	Foundation	Production Operations 1 - PO1
26	Foundation	Production Technology for Other Disciplines - PTO
26	Foundation	Unconventional Resources Completion and Stimulation - URCS
26	Foundation	Unconventional Resources Completion and Stimulation Diagnostics - URCSD
26	Intermediate	Acidizing Applications in Sandstones and Carbonates - ASC
27	Intermediate	Artificial Lift for Unconventional Wells - ALUW
27	Intermediate	Beam Pumps - BP
27	Intermediate	Electrical Submersible Pumps - ESP
27	Intermediate	Flow Assurance for Offshore Production - FAOP
28	Intermediate	Formation Damage: Causes, Prevention, and Remediation - FD
28	Intermediate	Gas Lift - GLI
28	Intermediate	Gas Production Engineering - GPO
28	Intermediate	Gas Well Deliquification - GWD
29	Intermediate	Hydraulic Fracturing Applications - HFU
29	Intermediate	Plunger Lift - PLS
29	Intermediate	Production Chemistry - OGPC
29	Intermediate	Production Logging - RMP
30	Intermediate	Sand Control - SNDC
30	Specialized	Advanced Hydraulic Fracturing - AHF
30	Specialized	Horizontal and Multilateral Wells: Completions and Stimulation - HML2
30	Specialized	Process Safety / Well Operations Integrity - PSWOI

PetroSkills part of RelyOn

Project Management

31	Foundation	Petroleum Project and Program Management Essentials - P3ME
31	Foundation	Project Management in Upstream Field Development - FPM2
31	Intermediate	Managing Brownfield Projects - FPM42
31	Intermediate	Petroleum Project Management: Principles and Practices - PPM
32	Intermediate	Project Management for Engineering and Construction - FPM22
32	Intermediate	Risk Management for Capital Projects - PMRM
32	Intermediate	Systems Completion, Commissioning and Start-up - CSU
32	Specialized	Advanced Project Management - FPM62
33	Specialized	Advanced Project Management II - FPM63
33	Specialized	Advanced Project Management Workshop - APMW
33	Specialized	Construction Management for the Project Professional - FPM64
33	Specialized	Petroleum Project Changes and Claims Workshop - PPCC

Reservoir Engineering

34	Basic	Basic Reservoir Engineering - BR
34	Foundation	Applied Reservoir Engineering - RE
34	Foundation	Enhanced Oil Recovery Fundamentals - ORE
34	Foundation	Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies - RFP
35	Foundation	Waterflooding A to Z - WF
35	Foundation	Well Test Design and Analysis - WTA
35	Intermediate	History Matching and Reservoir Optimization - HMRO
35	Intermediate	Integrated Reservoir Modeling - GRD
36	Intermediate	Oil and Gas Reserves Evaluation - OGR
36	Intermediate	Reservoir Characterization: A Multi-Disciplinary Team Approach - RC
36	Intermediate	Reservoir Management - RM
36	Intermediate	Reservoir Management for Unconventional Reservoirs - RMUR
37	Intermediate	Reservoir Simulation Strategies - RSS
37	Specialized	Chemical Enhanced Oil Recovery Fundamentals - EORC
37	Specialized	Coalbed Methane Reservoirs: Advanced Analysis Techniques - CMR
37	Specialized	Decline Curve Analysis and Diagnostic Methods for Performance Forecasting - DCA
38	Specialized	Enhanced Oil Recovery with Gas Injection - EORG
38	Specialized	Gas Reservoir Management - GRM
38	Specialized	Horizontal and Multilateral Wells: Analysis and Design - HML1
38	Specialized	Naturally Fractured Reservoirs: Geologic and Engineering Analysis
39	Specialized	New Opportunities in Old Fields
39	Specialized	Streamlines: Applications to Reservoir Simulation, Characterization and Management
39	Specialized	Unconventional Resource and Reserve Evaluation

PetroSkills part of RelyOn

39	Basic	Basic Drilling Technology - BDT
40	Basic	Casing and Cementing - CAC
40	Foundation	Drilling Fluids Technology - DFT
40	Foundation	Drilling Practices - DP
40	Foundation	Fundamentals of Casing Design - FCD
41	Foundation	Primary Cementing - Cementing I - PCE
41	Foundation	Stuck Pipe Prevention -- Train Wreck Avoidance™ - SPP
41	Foundation	Well Design and Engineering - WDE
41	Foundation	Well Site Supervisor Development Program
42	Intermediate	Cementing Practices - Cementing II - CEP
42	Intermediate	Deepwater Well Engineering - DWE
42	Intermediate	Directional, Horizontal, and Multilateral Drilling - DHD
42	Intermediate	Drill String Design and Optimization - DSD
43	Intermediate	Managing Wellsite Operations - MWC
43	Specialized	Well Planner Development Program

Basic Drilling, Completion and Workover Operations

BASIC: 5 DAYS BDC

This course presents the basics of drilling and completion operations, plus post-completion enhancement (workovers). Participants will learn to visualize what is happening downhole, discover what can be accomplished, and learn how drilling and completion can alter reservoir performance. Learn to communicate with drilling and production personnel.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Basic Petroleum Engineering Practices

BASIC: 5 DAYS BE

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Basic Petroleum Technology

BASIC: 5 DAYS BPT

This course provides the participant with an understanding of basic petroleum technology in the context of the Petroleum Value Chain and Asset Management, from exploration to abandonment. Unconventional shale (tight oil and gas) and conventional oil and gas are covered. The participant will understand how and when geoscience and engineering professionals use technology to determine and then optimize the economic value of an oil and gas field. This enables the participant to maximize their professional and administrative contribution in their organization. Participants first learn and understand why various global oil and gas production types and plays (unconventional and conventional) have different value. The participant learns which technologies are used by the geoscience and engineering departments during each stage of the asset life cycle and WHY! This E&P lifecycle context accelerates an understanding of basic petroleum technologies and the oil industry. This learning is achieved through guided discussions, videos, animations, and progressive team exercises utilizing 'Our Reservoir' and 'Our Well' as working models. This course is also available in a 100% online, on-demand format.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Overview of the Petroleum Industry

BASIC: 2 DAYS OVP

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

COURSE CONTENT:

- The Business of E&P
- Hydrocarbon origin
- Exploration - acquisition of exploration/ development rights
- Exploration - prospect generation & evaluation
- Appraisal - asset characterization & reserve quantification
- Development - drilling, completion, & facilities
- Produce Asset - recovery optimization strategies

TARGET AUDIENCE:

This course is designed for both technical and business-oriented professionals who are new to the upstream oil and gas industry or experienced in one area but could benefit from a broader perspective. It also provides non-industry personnel with a broad, basic knowledge of multiple Exploration and Production (E&P) topics. Legal, financial, accounting, management, and service company team members will certainly benefit.

Evaluating and Developing Shale Resources

FOUNDATION: 5 DAYS SRE

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

COURSE CONTENT:

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

TARGET AUDIENCE:

Reservoir, production and completion engineers, petrophysicists, geologists, geophysicists, and other professionals who desire a thorough overview of both current and emerging concepts, technologies, and processes related to shale gas and shale oil resource development.

Operations Crew Resource Management

FOUNDATION: 3 DAYS OCRM

Why do experienced, competent personnel make mistakes during the planning or implementation of operations? How does an organization address these potential mistakes? High-risk industries introduce and practice non-technical skills (NTS) coined as Crew Resource Management (CRM) to address human errors. In the late 1970s, the airline industry was plagued with many crashes and resulting fatalities. Often investigations yielded no evidence of design or mechanical failures, rather poor or inconsistent decision making was the major contributing factor to the incident (e.g., poor communications, distractions, leadership actions, lack of teamwork, changing situation without knowledge, stresses, and fatigue played a role in the incidents). The industry came together focusing on six non-technical skills, naming the effort CRM. After 40 plus years, CRM is still a major component of all airline industry training. Other high-risk industries began to incorporate CRM into their organizations to reduce the number of incidents. However, of recent, those and other industries have seen performance improvements with the incorporation of CRM. Introducing and practicing NTS has reduced nonproductive time thus improving performance delivery.

COURSE CONTENT:

Situational Awareness

- Information gathering
- Shared understanding
- Possible consequences
- Problems and contingencies

Decision Making

- Situation and goal definition
- Previous experence
- Risks
- Options
- Check

Communications

- Information exchange
- Context explanation
- Relevant inclusion

Teamwork

- Responsibilities
- Task coordination
- Gap/duplication resolution
- Working relationships
- Effort support

Leadership

- Taking charge
- Providing direction
- Task prioritization
- Delegation
- Organizational process

Stressors/Factors that Impact Human Performance

- Identification
- Mitigation
- Resiliency practice
- Effort recognition

TARGET AUDIENCE:

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

Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications

FOUNDATION: 2 DAYS IMLD

Recent advances in machine learning and the broader availability of computational power have made it possible to interpret rich, heterogeneous, and even real-time data. The oil and gas industry is leveraging this data-driven revolution to generate actionable insights from real-time production, drilling, and completions data, SCADA data streams, 3D and 4D seismic data, and well data such as cores, well-logs, thin-sections, and SEM images. Additionally, newer data types like DTS/DAS measurements are being utilized.

COURSE CONTENT:

Overview & Use Cases

- Introduction to machine learning terminology and workflows
- Data types, QA/QC, exploratory data analyses and its relation to insights gained from data-driven workflows
- In-depth discussion of use cases with the more popular unsupervised and supervised machine learning algorithms

Unsupervised machine learning algorithms and applications, including:

- Seismic facies identification from 3D seismic attributes; Rocktype prediction from cores/well log data
- Identifying hydraulic fracture locations from well-log or seismic data
- Well clustering to identify common attributes of productive wells

Supervised machine learning algorithms and applications. This is a list of a few applications:

- Linear regression
- Production forecasting
- Upscaling core-derived rocktypes to well-scale for 3D geomodelling
- Synthetic log generation (for instance: sonic log) from triple-combo data
- Predicting lost-time drilling incidents ahead of time, such as stuck-pipe or stick-slip, among others
- Real-time analytics for failure mitigation and prevention in artificial lift applications
- Identifying key geologic, petrophysical and completions-related variables driving well productivity

Best Practices

- Data collection, management, storage and accessibility with a specific focus on the oil and gas industry
- Challenges and pitfalls of data-driven methods in the oil and gas industry

TARGET AUDIENCE:

Geoscientists, petrophysicists, engineers, or anyone interested in subsurface engineering and geoscience applications of machine learning and data analytics.

Basic Petroleum Economics

BASIC: 5 DAYS BEC

Before starting any project, it's essential to answer these three questions: What will it cost? What is it worth? Will it earn sufficient profit? This course provides the necessary fundamentals to address these questions. It covers budgeting and financing, accounting, and contractual arrangements, all of which significantly impact a project's economic viability. Participants will practice cash flow techniques for economic evaluations and explore common scenarios.

COURSE CONTENT:

- Forecasting oil production
- Defining: reserves, operating expenses, capital expenditures, inflation, factors effecting oil and gas prices
- Cash flow techniques
- Economic criteria: interest, hurdle rate, time value of money, selection, ranking criteria
- Risk, uncertainty: types of risk, mathematical techniques, probabilistic models, uncertainty in economic analysis
- Financing, ownership in the oil and gas industry: business arrangements between operators, between mineral owners
- Accounting versus cash flow: accounting principles and definitions, differences between accounting cash numbers, depreciation, depletion, amortization
- Budgeting: types, processes, selecting of projects for the budget
- Economic analysis of operations
- Computer economics software
- Tips on economic factors in computer spreadsheet analysis
- Ethics in economic analyses

TARGET AUDIENCE:

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production. Participants will benefit from taking this course if they have no previous experience in the how and why of project economics, how project sanction and funding decisions are made and understanding oil and gas project decision making.

Essential Leadership Skills for Technical Professionals

BASIC: 5 DAYS OM23

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Essential Technical Writing Skills

BASIC: 3 DAYS ETWS

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Negotiation Skills for the Petroleum Industry

BASIC: 2 DAYS NSPI

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Technical Writing for Oil and Gas Professionals

BASIC: 2 DAYS TWOG

Technical writing excellence is very important for career growth in the oil and gas industry. Being able to document your work is key to gaining budget approvals, promotions, prestige, and recognition outside your company. Engineers, geoscientists, and support employees can boost their skills by taking this course from one of the industry's most experienced technical writers. The workbook exercises give participants a chance to put grammar rules to work immediately, ensuring retention of learnings. "This course was amazing! It included much more than I could have imagined. I considered myself proficient in English, and realized that I make certain mistakes almost daily." – Drilling & Completions Engineer "My supervisor has noticed an improvement in my writing since taking your course in person. It truly was beneficial." – Control Room Management Compliance "I think this class was fantastic and the instructor made it a blast. She was fun, energetic, and had so much passion teaching it. It was a great refresher for relearning proper grammar, especially since we write contracts daily." – Supply Chain "This was an outstanding course. It was surprisingly challenging, fun, and full of great information and resources. Jeanne is a uniquely talented writer and teacher." – Senior Artificial Lift Adviser "I would absolutely recommend this class. It was full of information that those in our field who do any kind of writing need to know." – Production Engineer

COURSE CONTENT:

- Parts of Speech – Nouns, Pronouns, Verbs, Adjectives, Adverbs, Preposition, and Conjunctions
- Building Sentences and Paragraphs – Structure and Flow
- Hyphenation, Punctuation, Quotes, and Expressions
- Page Layout – Spacing, Fonts, Styles, Templates, Bullets, and Numbered Lists
- Technical Terminology, Acronyms, Numbers, and Units of Measure
- Figures, Tables, Equations, Captions, and References
- The Writing Process
- Document Structure – Emails, Reports, SPE Papers, Journal Articles, Websites
- The Five C's of Writing
- Proofreading

TARGET AUDIENCE:

Any upstream technical professional in the oil and gas industry who speaks English and would like to improve the quality of his/her technical writing; also appropriate for non-technical support persons in exploration and production who prepare documents for oil and gas industry professionals. This course is particularly beneficial for those with English as a second language.

Contracts and Tenders Fundamentals

FOUNDATION: 3 DAYS SC-41

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

COURSE CONTENT:

- Overview of the contracting process
- Key issues in forming a contract in the oil and gas industry
- Establishing risk management priorities throughout the contracting process
- The legal environment and best use of legal counsel in contracting
- Avoiding and managing contract disputes in a challenging industry
- The tendering process and key documents in the tender package
- Buyer and seller pricing objectives to consider

TARGET AUDIENCE:

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

Cost Management

FOUNDATION: 5 DAYS CM

Few problems threaten the petroleum businesses more than uncontrolled costs. Economic realities have made it necessary for most companies to operate with a lean and mean philosophy. Industries previously operating under regulatory rules, which allowed them to pass on all costs to the customer, now face a changed regulatory environment. As the price of our products fluctuates widely, the most vulnerable companies are those that are ineffective in understanding and managing their costs. Historically energy companies have relied on the efficiency of their operations to drive company profitability. The ability to properly manage costs is now paramount in a company's success and even their ultimate survival. As the energy industry goes through its most monumental changes since the 1970s with huge swings in prices and costs, the companies that can identify efficiencies and inefficiencies will be able to react to the challenges of the global market place, thus generating higher profits. The course will cover costs management from the basics to the most recent events and trends, using relevant exercises, timely case studies, and role-playing techniques. This seminar is an introduction to Practical Cost Management techniques designed to help the participant better understand the underlying dynamics of cost, which will lead to better decision making concerning products and services, work flows, capital investments, as well as the day-to-day monitoring of the business.

COURSE CONTENT:

- Raising your own cost management awareness
- Defining costs, classifications and terminology in an oil and gas sense
- Classifying the different costs
- Determining cost objects, cost drivers and their behaviors
- Accurately and effectively assigning costs for an E&P company
- Properly determining the break-even cost and volumes
- Effectively using variance analysis budget for monitoring performance
- Analyzing different types of cost management systems
- Measuring activities and their performance
- Using Activities Based Management (ABM) to monitor costs and processes
- Building and using a practical activity dictionary
- Using value added costs versus non value-added costs for improvement
- Tying costs to revenues to more effectively measure profits
- Distinguishing between cost effectiveness and cost efficiencies
- Using 4 dimensional costs
- Developing productivity measurements that work
- Operating Cost Management
- Using the budgets efficiently and effectively
- Using GAP analysis in measuring productivity of costs
- Support departments cost allocations
- Transfer pricing
- Measuring and controlling productivity
- Optimizing costs in the supply chain
- Capital Cost Management
- Capital investment decision making and the effect on cost management
- Developing and analyzing capital investment projects
- Replace versus maintain
- Life Cycle Costing
- Analytical techniques for managing costs
- Managing personnel, logistics, purchasing and material costs effectively
- Sensitivity analysis for optimizing costs
- Using different scenarios to more effectively manage costs
- Performance measurement
- Incorporating HSSE into the cost management system
- Defining preventive and reactive costs

TARGET AUDIENCE:

Operating managers, field personnel, project managers, technology managers, budget managers, or practically anyone in the company wanting to manage costs in a more efficient and effective manner. A familiarity with finance is helpful but not required.

Economic Evaluation of Prospects and Producing Properties

FOUNDATION: 5 DAYS EPP

Property sales and acquisitions, lending, and investment joint ventures abound in the petroleum industry. What is most important for decision-making is to know the value of the subject asset. The evaluation model is central to understanding a project and valuing each party's interest. The model is the basis for communicating among project team members, managers, and partners. In this course participants learn good evaluation modeling practice and the decision analysis process. Appraisal modeling methods for upstream investments and operating decisions are discussed and experienced in this hands-on workshop. The learning objective is a process for delivering a credible and well-documented evaluation of reserves (or resource) and economic worth. Risk and decision analysis techniques are integral. Personal computer spreadsheets and other software are discussed. Optionally, computers with spreadsheet software may be used in this class. Model inputs include assessments about geologic, engineering and economics. Example calculations show typical engineering formulas employed in property evaluation. Drilling schedule, initial production rate and decline, product price and cost escalations, fixed and variable operating costs, simple taxes, and deal structure are added. The forecasting model translates the physical and economic project/asset description into resource/reserves, production and cash flow forecasts, and several decision criteria. Participants are encouraged to bring examples from their work for discussion. Please contact us if you wish to submit a problem in advance for possible use as a class exercise. Management buy-in and participation are essential to the success of decision analysis in an organization. The course instructor will be pleased to present a short executive briefing to managers and executives not attending the course. Please contact us if you would like to arrange a briefing session at some point during the training week.

COURSE CONTENT:

- Decision Tree Analysis: decision models, project threats and opportunities; value of information overview; advantages and limitations
- Monte Carlo Simulation: conventional and Latin hypercube sampling, portfolio problems, optimization overview, advantages and limitations
- Decision Criteria and Policy: value measures, multiple objective decisions, HSE considerations, capital constraint, risk aversion; credible analyses
- Modeling the Decision: decision analysis process; problem framing; influence diagrams, common petroleum risks; sensitivity analysis, modeling correlations, elements of good evaluation practice; accounting concepts useful in modeling; avoiding common mistakes in modeling cost and price escalations and in calculating present value; simple portfolio models
- Basic Probability and Statistics: three fundamental probability rules; Venn diagrams; calibration and eliciting judgments; choosing distribution types; common misconceptions about probability; judgments; avoiding biases in estimation; stochastic variance
- Expected Value Concept: foundation for decision policy, features and pitfalls to avoid
- Team Exercise: Evaluating an extension well location with probabilistic reserves concepts
- Implementing Decision Analysis: problem framing, guidelines for good analysis, team analyses, computer tools (discussion and demonstrations), mitigating risks

TARGET AUDIENCE:

Engineers, geologists, geophysicists, managers, planners, and persons new to analysis and evaluation responsibilities

Economics of Worldwide Petroleum Production

FOUNDATION: 5 DAYS EWP

In the area of corporate and international petroleum production, do you know how to choose the best investments? Can you properly evaluate investment opportunities? Do you know what investment criteria really mean and which criteria to use for best results? Answers to these questions will greatly improve your ability to make profitable decisions. Techniques for predicting profit, production, operating costs, and cash flow enable the analyst to evaluate decision alternatives for optimum results. Understanding cost of capital, financial structure, risk and uncertainty, present worth, rate of return, and other economic yardsticks enhances the quality and the value of economic analysis. Discover the effects of projects on corporate profits. Probe economic factors inherent in international concessions, contracts, joint ventures, and production sharing agreements. Practice making cash flow analysis of these contractual arrangements. Discussion of real-life examples with participants from many different countries enhances their value. Each participant receives Economics of Worldwide Petroleum Production written specifically for PetroSkills courses. Due to similarity in content, PetroSkills recommends that participants take this course if they have some previous experience in this field, as the course content is more advanced than Expanded Basic Petroleum Economics. "Very comprehensive." - Exploration & New Ventures Technical Coordinator, United States

COURSE CONTENT:

- Pricing: natural gas, marker crudes, OPEC, spot and futures markets, transportation
- Production rate: mathematical models
- Cash flow: revenue, capital and operating costs, spreadsheet exercises
- Economic evaluation: present value concepts, sensitivity and risk analysis, decision trees, royalty, sources of capital, incremental economics, sunk costs, inflation
- Budgeting: examples and exercises, long-range planning
- Cash versus write-off decision: depreciation, depletion, and amortization
- How to read an annual report: statements, financial ratios, what is and is not included, reading between the lines
- Worldwide business operations: concessions, licenses, production sharing contracts, joint ventures, cost of capital, sources of funding, debt and equity
- Performance appraisal: buy/sell assessments
- Computer economics software
- Tips on format and inclusion of economic factors in computer spreadsheet analysis
- Ethics in economic analyses

TARGET AUDIENCE:

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

Effective Materials Management

FOUNDATION: 3 DAYS SC-42

This three-day course covers practical considerations essential to achieve major improvements in planning, buying, storing, and disposing of the vast array of materials and spare parts needed in the oil and gas industry. Evolving best practices by major oil and gas companies are explored under three inter-related modules - inventory management, warehousing, and investment recovery. “Overall - very good intro to inventory and warehouse practices.” - Sourcing Specialist “Instructor was very prepared and very knowledgeable.” - Field Engineer

COURSE CONTENT:

- Setting comprehensive inventory goals and objectives

TARGET AUDIENCE:

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

Managing and Leading Others

FOUNDATION: 3 DAYS MLO

Why would any company expend hundreds of thousands of dollars to seek, recruit, and hire the best employees then leave their development and performance to lucky chance through ineffective leadership and management practices? Unfortunately, that chance occurs every time an employee is promoted to a leadership, supervisory or management position without training in the techniques and practices of effective leadership and management. Managers and supervisors, regardless of technical expertise, can make an error setting off an uncontrolled and disastrous chain reaction unless he/she has command of principles and practices leading to employee effectiveness, productivity, and teamwork. The first-line and mid-level supervisor has more direct effect on employees and the productivity of a work group than any other single entity in the organization. This course increases the confidence and productivity of leaders, supervisors and managers who may be scientific or technical specialists, but have minimal training in the science and art of leading others. Skills in human relations, communication, motivation, and leadership are essential tools for the supervisor and manager. This course provides techniques enabling leaders to efficiently use one of the greatest resources a company has, its people. This highly interactive learning program will assist you in expanding your options for leading others. You will explore different concepts of management and leadership and how to apply your new skills in real world applications. “Day 2 activities (situational management) was GREAT!” - Integrated Operations Planner “Liked Performance Assessment the most.” - Researcher, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Meeting Management and Facilitation for the Petroleum Industry

FOUNDATION: 2 DAYS MMF

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

COURSE CONTENT:

- Speaking skills
- Time management in meetings
- Agenda creation
- Conflict management
- Meeting facilitation aids

TARGET AUDIENCE:

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

Petroleum Finance and Accounting Principles

FOUNDATION: 5 DAYS PFA

Making the most efficient use of your resources is critical to the success of any company. Finance and accounting comprise the universal business language and help you manage those resources effectively. Planning and decision making that occur in an informal financial context permit better application of resources and promote competitive advantage. The aim of this course is to improve delegates’ job performance by enhancing their understanding of current international practices in finance and accounting within the E&P industry. This is achieved through an examination of (a) accounting standards, policies, and practices in the oil and gas industry, and (b) the accounting and financial management implications of exploring for and producing oil and gas. An understanding of accounting also allows a company to trace a competitor’s actions from its financial statements and to plan accordingly. The latest issues: The role of International Financial Reporting Standards (IFRS) in today’s environment, IFRS 6; COPAS involvement; intangible and tangible asset disclosure and their treatment; Joint operations, Reserves disclosure - Standardized Measure of Oil and Gas (SMOG), (FAS 69 and FRS 3) Capitalized Asset assessment - Present Value 10 construction; Comparative Analysis of Financial Statements: Analyzing the financial statements, common sizing; rate of change; basic ratios; oil and gas industry standards; trends over time. “Enjoyed the course. Instructor’s personal experience and ability to apply the materials to the industry.” - Graduate Reservoir Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Petroleum Risk and Decision Analysis

FOUNDATION: 5 DAYS PRD

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

Disclaimer
This course requires modifications for the Greenhouse Gas Management discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

- Decision Tree Analysis: decision models, value of information (a key problem type emphasized in the course), flexibility and control, project threats and opportunities
- Monte Carlo Simulation: Latin hypercube sampling, portfolio problems, optimization, advantages and limitations
- Decision Criteria and Policy: value measures, multiple objectives, HSE, capital constraint, risk aversion
- Modeling the Decision: influence diagrams, sensitivity analysis, modeling correlations
- Basic Probability and Statistics: four fundamental rules including Bayes' rule (the easy way), calibration and eliciting judgments, choosing distribution types, common misconceptions about probability
- Expected Value Concept: foundation for decision policy, features, pitfalls to avoid
- Implementing Decision Analysis: problem framing, guidelines for good analysis practice, team analyses, computer tools (discussion and demonstrations), mitigating risks
- Evaluating a multi-pay prospect (team exercise)

TARGET AUDIENCE:

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

Presentation Skills for the Petroleum Industry

FOUNDATION: 3 DAYS PSPI

One of the prime requisites for oil and gas professionals is to be able to deliver presentations in as clear, concise, and well-designed a way as possible. Some industry technical professionals are naturally gifted designer/speaker/presenters, others are not. However, with the proper training and practice any oil and gas professional can learn to make a convincing and persuasive presentation, and do so in a confident, assured, comfortable, and relaxed manner. This course is for individuals who are required, as part of their jobs, to deliver presentations in-house or in public, and who wish to perfect the art and craft of dynamic presentation-making in order to do so. Participants will participate in a full array of hands-on class exercises to improve presentation-making skills, vocal techniques, social interaction skills, visual aid preparation, etc. Attendees will deliver two presentations in class, both of which will be videotaped to measure improvement, and will discuss their performances in one-on-one private conversations with the instructor at the end of the course. Participants' progress will also be charted to quantifiably show areas in which actual improvement has taken place. "By far, the best course I've taken in my three year career. Entertaining, engaging, and useful material for now and for the future. Tips and feedback were very personalized and much appreciated." - Safety Specialist, United States "Fun, practical." - HM Reservoir Engineer

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Cost/Price Analysis and Total Cost Concepts in Supply Management

INTERMEDIATE: 2 DAYS SC-64

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

COURSE CONTENT:

- Use of price indexes
- Cost/price analysis
- Total cost of ownership
- Cost estimating relationships
- Purchasing savings impact on the bottom line
- Developing the spend profile
- How to perform the ABC analysis
- Difference between cost and price analysis
- Selection tool
- Methods of price analysis
- Historical analysis
- Major elements of cost
- Requesting supplier cost info
- Sources of cost information
- What and how important are supplier overheads
- How much profit should the supplier make economic
- Economic price adjustment clauses
- Total costs of ownership models
- How to combine price and performance to obtain TCO

TARGET AUDIENCE:

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

Inside Procurement in Oil and Gas

INTERMEDIATE: 3 DAYS SC-61

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

International Petroleum Contracts

INTERMEDIATE: 5 DAYS IPC

You will learn the philosophy, evolution, and fundamentals of international petroleum contracts and have an opportunity to see how each of these actually works. You will take part in life-like negotiating sessions mastering many negotiating techniques, where a mistake is a learning experience not a disaster. As you prepare for each session, you use a computerized economic model to assess the value of contract terms. This enables improved planning of negotiating strategies to achieve the desired goals by parties on both sides of the negotiating table. The classes include participants from both national oil companies and foreign contractors, which adds further realism to the exercises. Host governments and outside contractors are on opposite sides of the negotiating table, but they are not adversaries. A win-win business arrangement should be the objective of both parties, as a signed contract makes them partners. A viable contract cannot be negotiated without an effective understanding of the underlying economics. Negotiating strategies will determine contractual terms ultimately defining the economic benefits to be realized. Concessions and production sharing agreements are two of the contract types to be evaluated. Each participant receives a disk copy of the spreadsheets used in the negotiation workshop and a manual, which explains the fundamental principles of E&P contracts, presents examples of economic analysis, and includes a model contract. "Liked the mock negotiations the most." - Reservoir Engineering Advisor, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Making Change Happen: People and Process

INTERMEDIATE: 2 DAYS MCPP

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Strategic Procurement and Supply Management in the Oil and Gas Industry

INTERMEDIATE: 2 DAYS SC-62

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

COURSE CONTENT:

- Stages to world class supply management
- Change and becoming more strategic
- Supply management skill sets
- Examples of job descriptions for supply management
- Developing the spend profile
- Creating time to be strategic
- The ABC (Pareto) analysis and what to do with it
- Material/services purchasing code development
- Producer price indexes
- Requesting supplier's cost and pricing data
- Dealing with economic uncertainties, when, where, and how to use "Economic Price Adjustment" clauses
- Total cost of ownership concepts
- Developing purchased materials/services strategic plans
- Developing the purchase price index for your organization

TARGET AUDIENCE:

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

Supplier Relationship Management

INTERMEDIATE: 2 DAYS SC-63

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

COURSE CONTENT:

- The organizational challenge
- Defining the supply management mission and vision
- Critical supply strategies
- Defining Supplier Relationship Management (SRM)
- The SRM Maturity Model
- Major components of SRM
- Defining levels of the organization's SRM Maturity
- The critical ABC analysis
- Commodity and service coding

TARGET AUDIENCE:

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

Advanced Decision Analysis with Portfolio and Project Modeling

SPECIALIZED: 5 DAYS ADA

Quality forecasts and evaluations depend upon well-designed project and portfolio models, clear decision policy, sound professional judgments, and a good decision process. In this course, participants learn to build good decision models. We use Microsoft Excel as the calculation platform for risk assessment, project evaluation, and simple portfolio models. Add-in software provides Monte Carlo and decision tree capabilities. The course emphasizes evaluation concepts and techniques rather than particular software programs. Participants work in pairs using a shared personal computer.

COURSE CONTENT:

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

TARGET AUDIENCE:

Evaluation engineers, project planners, business analysts, economists, and managers This course is for professionals involved with project evaluation, portfolio, and other forecasting and assessment models. Participants should have a prior background in decision analysis through work experience or attending a DA course such as Petroleum Risk and Decision Analysis.

Before registering, please visit http://www.decisionapplications.com/ada-pre-read/ to review a course prerequisites list and to take a short self-assessment quiz. Use 'ada' (no quotes) as the password.

Basic Petroleum Geology

BASIC: 5 DAYS BG

This course introduces the basic concepts of Petroleum Geology. A key goal is to explain the vocabulary and context of Petroleum Geology, enabling participants to understand the geologist's role in Petroleum Exploration and Production for both conventional and unconventional resources. The course includes numerous case histories and examples that illustrate the concepts and principles presented. Primary objectives are to broaden your geological vocabulary, explain selected geological principles and processes, and describe how certain petroleum reservoirs and source rocks are formed.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Computer-Based Subsurface Mapping

FOUNDATION: 5 DAYS CSM

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Geochemistry: Tools for Effective Exploration and Development

FOUNDATION: 5 DAYS MGT

Undiscovered reserves in prolific, mature basins and bypassed petroleum in developed fields are key targets for increasing reserves at minimal cost. Geochemical tools can dramatically improve discovery and development success by identifying and characterizing these targets in both conventional and unconventional systems. Course participants learn to interpret geochemical logs, map organic facies variations, identify petroleum systems using multivariate data, and predict vertical and lateral variations in oil quality and gas-to-oil ratios. The course teaches how to integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression. The class gives special attention to three key applications of oil fingerprinting to unconventional reservoirs: Characterization of frac height Quantification of the contribution of multiple formations to commingled production contacted by the induced fractures Identification of 'cross talk' between wells completed in adjacent formations. The course also explains how to optimize development by predicting vertical and lateral variations in API gravity and viscosity. Attendees learn interpretive guidelines to evaluate geochemical data. Interpretation pitfalls are illustrated using exercises. Sample collection techniques are discussed. No background in geochemistry is needed. "Great class. Thanks! I feel like I learned a lot of new ways of utilizing the data I regularly work with." - Geologist, United States "Everything shown was very useful. Really enjoyed the GC section and learning to interpret available GC data." - Geologist in Exploration

COURSE CONTENT:

- Assessing source rock quality, maturity, and petroleum-generating potential
- Correlation: oil-to-oil, oil-to-source rock, gases-to-source rock
- Applications of mud gas isotope data and mud gas compositions
- Assessment of reservoir continuity, lateral and vertical changes in oil gravity and viscosity
- Geochemical assessment of frac height
- Geochemical allocation of commingled production
- Worldwide exploration and production case studies
- Determining the origin of hydrocarbon gases found in aquifers
- Project planning using actual case studies

TARGET AUDIENCE:

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

Horizontal Well Placement and Geosteering

FOUNDATION: 5 DAYS HWP

Advances in technology have dramatically reduced the time needed to transmit down hole tool responses to those responsible for interpreting the data in the context of the geological play and the reservoir. It follows that geoscience would request course corrections, which would be relayed to the field, and over time take a more proactive role in 'geosteering' wells while drilling. However, advances in technology have also dramatically reduced the time needed to drill these wells, and proactively geosteering a well while drilling has come to require more than just an understanding of the geoscience. Geosteering personnel must now be able to gather and process incoming data and make targeting decisions with little time to spare. Down hole log responses must be understood within the context of the entire bottom hole assembly (BHA), including its limitations, and must incorporate trigonometry (for surveys and targeting) as well as the needs of the intended completion/production plan in order to modify targets for a well while drilling. Last but not least, there needs to be a clear process to communicate back to the field, so that the well site engineer and geologist are properly aligned. This 5-day course will introduce participants to the general concepts of Geosteering. The first 2 days of this course review BHA components, directional drilling, surveys and other necessary background knowledge at a level appropriate for the course. An example well and exercises introduce the skills needed to geosteer a well. Then the focus changes to interpretation, offering progressively more complex case study examples, and reinforcing log interpretation and early learnings as we review decision points on example wells. Along the way, pinch points are identified, and strategies to manage them are introduced, and for each example, completions intervals are identified.

COURSE CONTENT:

- Components of bottom hole assemblies, and mechanisms for steering
- Introduction to Down hole surveys (trigonometry)
- Understanding the resistivity tool response in a horizontal well
- Introduce the Azimuthal Deep Resistivity (ADR) responses
- Interpret responses from down hole tools, in the context of drilling
- Review of final drill results before submission to completions
- Ensuring clarity around decision making and authority when steering
- Target windows and tracking for geosteering
- Strategies around casing point
- Further case studies demonstrating the complexities of geosteering

TARGET AUDIENCE:

Geoscientists, engineers, or anyone interested in drilling, operations geology or geosteering

Mapping Subsurface Structures

FOUNDATION: 5 DAYS MSS

Not just a collection of rules of thumb, this class presents the fundamental concepts and techniques required to accurately construct structure maps in 3D so that you will get the most out of your data. Principles and techniques are illustrated by solving numerous exercises by hand (with drafting tools and a calculator) using strategies and workflows analogous to those that participants will use back at the office using computers. Participants will be prepared to develop more accurate structural models of reservoirs, avoid dry holes, find new traps in old fields, extract the maximum information from exploration wells, and validate or recognize errors in existing interpretations. Dr. Richard Groshong's book, 3D Structural Geology, is included with the course materials. "The course gave a very good basic understanding of structured geology as a whole. For me, not being a geologist, this helped a lot to clarify concepts, terms for my general career development." - Junior Geophysicist, Austria "It is applicable to my job, especially the QC of the structural maps." - Exploration Geologist, United Arab Emirates

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Sandstone Reservoirs

FOUNDATION: 5 DAYS SR

This course is essential for geoscientists and engineers involved in the exploration and development of clastic reservoirs. It focuses on methods that can be used to improve the prediction of reservoir size, shape, trend, and quality through detailed analysis of depositional environments. The sedimentary characteristics of each of the principal clastic depositional systems are presented in detail, using examples from recent environments, outcrops, cores, wireline logs, and test/production data from oil and gas fields in various parts of the world (United States, North Sea/Atlantic, Africa, Middle East, Far East, etc.). Practical exercises are taken from each of the principal depositional settings and involve detailed mapping, interpretation of core and log characteristics, and integration of data from FMI logs. Emphasis is placed on the application of fundamental sedimentary principles (modern, ancient, and subsurface) to actual subsurface data so that the participants can immediately use the information in their exploration and development activities. "Enjoyed exercises because they give you a practical application to the theory learned in lectures. Important because they show how to integrate well data, FMI logs and core data to get full picture/best interpretation." - Development Geologist, Canada "Comprehensive and covers all aspects of Sandstone Reservoirs." - Staff Geophysicist

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Sequence Stratigraphy: An Applied Workshop

FOUNDATION: 5 DAYS SQS

Sequence stratigraphy, based on sedimentary response to changes in relative sea level gives the explorationist and the development geoscientist a powerful new predictive tool for regional basin analysis, shelf to basin correlation, and reservoir heterogeneity. Perhaps most importantly, sequence stratigraphy gives the geoscientist a superior framework for the integration of geologic, geophysical, and engineering data and expertise. The particular strength of this seminar is the application of these basic principles to actual subsurface data sets gathered into a series of well-founded exercises. In recent courses the data sets included Miocene delta complexes in Venezuela, Cretaceous incised valleys in the US, Paleozoic mixed carbonate clastic basin floor fans and low stand prograding complexes in the US, and Jurassic basin floor and slope fans in France. "The exercises were extremely helpful. The "idealized" parasequence exercises were great for visualizing, and then the follow up, more realistic exercises were perfect for cementing the concept. Same idea for the sequence exercises." - Geologist, United States "Hands-on" - Geologist, Japan

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Structural Styles in Petroleum Exploration

FOUNDATION: 5 DAYS ST

Even with the best of data, the correct interpretation of a subsurface structure usually requires recognition of the fundamental characteristics of the assemblage in which it occurs and the range of trap styles to be expected. This course provides an overview of all hydrocarbon-bearing structural assemblages and their associated trap types. The processes that produce the structures and control their styles are interpreted in terms of basic rock-mechanical principles. Classic outcrops, physical models, 2D and 3D seismic, and mature-field log-based interpretations from around the world provide analog examples for practical interpretation. Participants will learn the major structural trap geometries and the structural concepts for predicting the geometry where data are absent, misleading, or conflicting. The principles of section balancing and restoration are covered as tools for validating interpretations and for documenting structural evolution. Practical interpretation skills are developed in numerous exercises, most of which use seismic data. "I enjoyed the ancient and modern analogues during presentation - like a virtual field trip. I thought the exercises were good - short, simple, but got the point across. I appreciated the focus on 'where to drill.'" - Senior Staff Geologist, United States "Liked exercises and seismic section practicing. Very good instructor and friendly and knowledgeable." - Geologist, Kuwait

COURSE CONTENT:

- Comparative structural geology
- Structural families and styles
- Mechanical principles governing fold and fault geometry
- Predicting structure from stratigraphy
- Folding vs. faulting
- Palinspastic restoration of cross sections
- Structural validation criteria
- Sequential restoration and growth history
- Regional arches and domes
- Compaction and substratal solution
- Wrench faults: simple, convergent, and divergent
- Conjugate and domino-style strike-slip regimes
- Thin-skinned fold-thrust belts
- Fault-related folds
- Duplexes
- Basement-involved contraction
- Vertical and rotational block uplifts
- Inversion: dip-slip to strike-slip
- Thin-skinned extension
- Basement-involved extension
- Half-graben and full graben rift systems
- Domino-style extension
- Diapirs
- Salt sheets
- Roho and counter-regional pseudoextensional fault systems
- Plate-tectonic habitats of structural assemblages
- Tectonic synthesis and exploration project

TARGET AUDIENCE:

Exploration geologists, geophysicists, engineers, and geoscience managers.

Analysis of Structural Traps in Extensional Settings

INTERMEDIATE: 5 DAYS ESS

Extensional terranes provide some of the world's largest known and most prolific oil provinces and are the fundamental underpinning of most continental and deepwater margins. As one of the most common structural styles, they are present on all continents and form most continental shelves. The advent of 3D seismic technologies has revolutionized structural mapping, but the most realistic geologic interpretation of these structures is only as good as our ability to recognize and exploit the fundamental characteristics of the forms that are possible. This is the aim and purpose of this course. This course presents outcrop, subsurface, and seismic data along with model analogs to support structural interpretation in a wide range of extensional environments: thin-skinned environments along with the underlying, often hyperextended passive margins as well as intracontinental rifts. Fault linkage, relay ramp, transfer systems, and intrabasinal structural geometries are investigated in 3D using predictive kinematic and restorative thinking. The course covers the field level all the way up to basin-scale architecture, and the role of salt and strike-slip tectonics in the development of extensional basins. The typical traps related to extensional geometries are surveyed using real-world examples, with some review of deformational effects on reservoir quality. Exercises include typical seismic examples and field studies. The fundamentals of fracture dynamics are covered in connection with the evolution of extensional faults, as are such important topics as fault sealing issues and inversion. The instructor is happy to accept examples from your company for analysis in the class as one of the demonstration exercises. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time. The 3-day classroom course is followed by a 2-day field trip to the Death Valley area to reinforce the material from the classroom.

COURSE CONTENT:

- Variety of extensional structural styles and their habitats of development; relationships to other structural styles
- Fundamental processes of the growth and coalescence of extensional structures, evolution of a rift basin to a passive margin
- Elements of extensional systems in both 2D and 3D views: fault linkage, relay ramps, highs, and lows in basins, etc.
- Relationships of full and half grabens and their associated features
- Relief in extensional systems, e.g. footwall uplifts, and their relationships to depositional systems, terrestrial and marine systems
- Basics of restoration and validation; restoration algorithms for extensional systems
- Basics of fracture mechanics in connection with rifts and fracture systems in extensional environments
- Examples and expression of these features in the Death Valley Extensional Field in southern Nevada and California

TARGET AUDIENCE:

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

Basin Analysis Workshop: An Integrated Approach to the Exploration and Evaluation of Conventional and Unconventional Resources

INTERMEDIATE: 5 DAYS BA

Basin analysis, whether for conventional or unconventional resource play analysis, demands an integrated approach from explorationists. It is both inappropriate and misleading to suggest that the tectonic-thermal-sedimentologic evolution of any one basin is an established fact, or even that all basins submit to the same simple and equivocal models. Therefore, this five-day course does not passively present an inventory of basins of the world. Instead, this workshop provides the theory, methods, and active practice for participants to develop and optimize their own individual basin evaluation and modeling modus operandi. Incorporated as practical problems for workshop analysis and substantial team discussion are case histories and new findings from throughout the world utilizing geologic, geophysical, and geochemical data sets. In addition, students construct and interpret their own 1D and 2D basin models using BASINMOD, an industry standard of basin modeling software. One personal computer is provided at additional cost for each participant. When this course is presented as an in-house two-week format, it builds upon the previous week's material with the added integration of petrophysics and seismic stratigraphy to a more in-depth evaluation of a variety of international plays.

COURSE CONTENT:

- GEOMECHANICAL FUNDAMENTALS: Wilson Cycle Paradigm, Dickinson (1974) Basin Types, The Burial History Curve, Rheological vs. Compositional Definitions, Beta and Alpha of Rifting, Elasticity, Why Basins Subside/Uplift, Tectonic Subsidence Analysis
- GEOTHERMAL CRITICALS: Heat Flow: The Master Parameter, Geothermal Gradients, Integrating Heat Flow and Geothermal Gradients
- GEOCHEMICAL CRITICALS: Quantity (Om), Quality (Organofacies), Maturity, Synthesis
- MIGRATION CRITICALS: Expulsion (Micromigration), Migration (Macromigration), Remigration, Pathway Construction Rules, Pathways as a Function of Basin Elasticity
- RESERVOIR CRITICALS: Conventional Reservoir Quality, Clastics, Conventional Reservoir Quality, Carbonates, Less Conventional Reservoirs, Unconventional Resource Overview, Sequence Motifs
- SEAL AND TRAP CRITICALS: Top Seals (Cap Rock), Fault or Lateral Seals, Permeability, Seal Thickness, Seal Lithology, Pressures and Seal Integrity, Evaluation of Seal Ductility, Synthesis
- TIMING CRITICALS: Revisiting the Basin Classification, Examples of Kingston's Basin Classification, Events Chart
- RISK AND DECISION-MAKING: Basic Concepts, Petroleum Reserve Definitions, Stochastic-Deterministic Definitions, Qualitative Risk Assessment: Georisk, Quantitative Deterministic, Quantitative Stochastic Monte Carlo, Game Theory and Decision Trees
- SUMMARY: THE PETROLEUM SYSTEM AS PRAXIS

TARGET AUDIENCE:

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

Compressional and Transpressional Structural Styles

INTERMEDIATE: 5 DAYS CPST

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Deep-water Turbidite Depositional Systems and Reservoirs

INTERMEDIATE: 5 DAYS DWT

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of iteration of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow deposition and process including many case studies of reservoir architecture and sand-body quality and distribution with an introduction to new concepts, ideas, and methods in turbidite reservoir geology. Participants will be introduced to the limitations of conventional models for turbidite reservoirs and taught how to build enhanced predictive models using a combination of subsurface, outcrop, and modern sea-floor data. Through practical exercises and discussions, participants will experience the relative importance of a broad range of subsurface data, including the merits of different wireline log data for distinguishing lithostratigraphic units. 3D seismic data from a range of locations will illustrate the quality and level of reservoir resolution possible when using modern data. Modern sea floor data from several turbidite basins will be available and participants will receive instruction on interpretation, especially where sea floor data can be used as a proxy of sand distribution in reservoirs. Criteria for identification and interpretation of injected sandstones will be discussed, including explanation of their mechanisms of formation, and the understanding of their influence on reservoir characteristics. Special note: sessions in Nice and Kilkee will include field trips. The seven-day sessions will be combined field and classroom based sessions. There will be four days in the classroom with lecture material and oilfield exercises on exploration and production, and three days in the field examining spectacular deepwater sections of either the Annot Sandstone Formation in Nice, Ross Sandstone Formation in Kilkee, or the Point Lobos Submarine Canyon and Pigeon Point Formation in Monterey, California. For Nice session, a moderate degree of physical fitness is required. For Kilkee, the going is easier in the field. "Field trip component was great - it tied in really nicely with the classroom material. Also nice to have rock fabric schemes and associated deposition/flows." - Petrophysicist "The field portion was fantastic. Loved the classroom exercises." - Geologist

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Development Geology

INTERMEDIATE: 5 DAYS DG

Successful field appraisal, development, and management requires a fundamental understanding of the reservoir pore space distribution. Participants learn, through hands-on exercises, to compile a development plan that emphasizes optimal recovery. Emphasis is placed on rock, log and test data to distinguish reservoir and non-reservoir rock properties. Structural, stratigraphic, deposition and diagenetic concepts are used to locate drill sites and describe reservoirs. The input required to construct a geologic reservoir model is reviewed. Participants learn the importance of modifying development plans as a field becomes more mature. Techniques for mature field rejuvenation are discussed through case histories. "Course is very good, no improvement required. All topics are well covered." - Geophysicist, Oman "I appreciated the flexibility of the course/professor to meet the needs of the class and address our specific fields/projects." - Reservoir Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Geochemical Techniques for Solving Reservoir Management and Field Development Problems

INTERMEDIATE: 5 DAYS GTS

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Operations Geology

INTERMEDIATE: 5 DAYS OG

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Prospect and Play Assessment

INTERMEDIATE: 3 DAYS PPA

Assessment of plays and prospects is an important tool in managing financial and human resources. This fully revised and updated course is a fully modern approach to defining prospect and play volumetrics, uncertainties in defining these volumes and the risk that the accumulation exists. This practical course is adaptable to any workplace. The course evaluates other published approaches and contrasts them with the recommended procedures allowing the participants to choose the very best approach to resource evaluation. This course offers the industry quantitative, probabilistic play and prospect assessment procedures that are consistent and repeatable allowing for direct comparisons play to play or prospect to prospect. In addition, the methods offer measures of the play prospectiveness based on the number and resource size distribution of potential future fields. The course objectives are: To provide knowledge and unique tools for practical, systematic, predrill assessment of potentially recoverable oil and gas To use the best available methods - trap volumetrics and hydrocarbon charge for prospects, and potential numbers and sizes of prospects for plays To quantify all geologic risks and uncertainties To provide insights for managers and reviewers in evaluating assessments, avoiding pitfalls, high-grading exploration opportunities, and planning selectively for the future. It focuses on the exploration concepts and models that are essential to effective assessments. The concepts and techniques learned in the course are applied to real industry examples in exercises and workshops. Tools include comprehensive assessment forms for prospects and plays, and graphs, data tables, and guidelines for making all assessment decisions. These tools help participants estimate risks and success ratios, field-size distributions, field and prospect densities, trap geometry corrections, multiple reservoir factors, porosities, permeabilities, saturations, formation volume factors, gas/oil ratios, formation temperatures, oil and gas recovery efficiencies, API gravities, gas gravities, NGL ratios, and oil and gas yields from source rocks. The forms and procedures are easily adaptable for internal usage in any oil and gas organization. All factors can be handled in either metric or English units. "Overall very good and useful course. Content and presentation of content were excellent." - Senior Geophysicist, Germany The exercises were great, and examples were fantastic." - Geologist, United Arab Emirates

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Basic Geophysics

BASIC: 3 DAYS BGP

This course is designed to familiarize anyone using seismic data with the nature of the data and what they specifically represent. One of the key goals of the course is to explain the large and confusing amount of jargon that is used by the geophysical community when they use seismic data. The course is supplemented by a large number of case histories that concretely illustrate the principles in the course material.

Disclaimer
This course requires modifications for the Carbon Capture, and Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Seismic Imaging of Subsurface Geology

FOUNDATION: 5 DAYS SSD

This course is designed for those working with reflection seismic data to understand and appreciate the underlying principles and processes leading to final images and associated attributes. Basic seismic imaging principles and techniques are introduced at the outset of the class to establish the purpose, underlying principles, parameterization, and limitations of the various processing steps leading to final seismic images provided by current state-of-the-art imaging techniques. The course focuses on 3D seismic data. By the end of the course, the participant will understand and appreciate the many steps leading to final interpretable images and will be able to recognize possible problems introduced or not mitigated by the processing flow. Moreover, the participant will understand how seismic acquisition and data processing steps affect seismic amplitudes to assess their validity as input to various post-imaging seismic attribute and inversion processes. The lectures are complemented by many case-history examples, hands-on exercises and real-time data processing examples. Although mathematics is kept to a minimum, some understanding of 1D and 2D filtering is helpful. Course participants are encouraged to bring their own data examples for individual and group discussions. The material covered in this course provides essential basics to intermediate and specialized geophysics courses such as AVO Inversion and Attributes, Seismic Attributes for Reservoir Characterization and Applied Seismic Anisotropy for Fractured Reservoir Characterization. Those who have had limited prior exposure to seismic data should consider taking Basic Geophysics for an introduction prior to taking this course. "The knowledge of the instructor was beyond any questions asked. All questions were easily and thoroughly answered." - Geologist, Midland, United States "The instructor was very interested in helping students understand, and was very effective at explaining complicated ideas in basic ways." - Geotech, Houston, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Seismic Interpretation

FOUNDATION: 5 DAYS SI1

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Seismic Velocities and Depth Conversion

FOUNDATION: 5 DAYS SVDC

Seismic data is acquired in time - the time taken for the sound to travel from the source to reflectors and to return to receivers. However, wells are drilled in depth, not time. Variations in velocity can distort the depth, size, and shape of possible reservoirs. Therefore, conversion from time to depth is needed for a clear picture of the prospect and the risks involved. This course will teach you how to use velocity information and structural inputs to build a consistent velocity model and/or calibrate ones that have been created during seismic data processing. In the last decade or two, large strides have been made in seismic processing, especially in PreStack Depth Migration. Routinely used advanced migration algorithms now require more accurate velocity models. Better tools have been developed to ascertain the velocity, and more time and effort are now spent in velocity analysis by the seismic processors. This has greatly improved current velocity models. The interpreter, however, still needs to know how the models are made, how to quality control them, and how to modify and correct them when needed. This class is designed for the interpreter so that he or she understands the theory and practice of how to estimate depths from older time-migrated data, as well as how to quality control (QC) and calibrate newer PSDM data. Also covered in this class are when to reprocess the data and how to communicate with the processor in order to produce the best velocity model and depth image. As a foundation class, the instruction starts with the basics and proceeds to more complex topics. The student should have a basic understanding of geophysics such as offered in PetroSkills' Basic Geophysics course. Little advanced math (calculus) is used, but algebra and lots of diagrams are applied to explain the needed concepts. "Vivid presentation of the topics, complicated problems were explained very well and easy to understand." - Participant, Germany

COURSE CONTENT:

- Velocity: definition and comparison of the many types of velocity including average, interval, RMS, stacking, migration, P-wave, and S-wave
- Velocity Inputs: accuracy and regional extent of each, including check shots, VSPs, sonic logs, time/depth functions, well picks and pseudo velocities, seismic velocities, and horizons for structural control
- Synthetic Seismograms: creation, upscaling, and tie to seismic data. Advanced synthetics including synthetic gather creation, Zoeppritz equations, AVA, and AVO
- Matching Synthetics to Seismic: calibrating the seismic data to the well data
- Seismic Velocities: semblance analysis, velocity picking, multiples, and how seismic velocities differ from well velocities
- Migration and Migration Velocities: introduction to pre- and post-stack algorithms, tomography, and iterative velocity analysis
- Velocity Model Building: workflows to integrate stacking velocities, time/depth curves, well picks associated with seismic horizons (pseudo-velocities), and structure from horizons
- Time-to-Depth Conversions: vertical stretch, inverse raytracing, migration, and uncertainty
- Introduction to Advanced Topics: anisotropy, pore-pressure prediction, geostatistics, and forward modeling

TARGET AUDIENCE:

Early-career geoscientists and engineers, especially seismic interpreters, and anyone who needs to understand the basic theory and procedures for creating velocity models and converting seismic data from time to depth. This is a foundation level course. It is neither designed nor paced for the experienced velocity modeler or processor.

AVOI Predicting Reservoir Characteristics with Pre-stack Seismic Amplitude Analysis & Inversion

INTERMEDIATE: 3 DAYS AVOI

The subject of direct hydrocarbon indicators and AVO has rapidly expanded to include AVO inversion, offset AVO inversion, and 4D AVO inversion. A significant part of the course deals with rock physics as it relates to the other topics in the course. Further insight into the seismic data is supplied by looking at seismic attributes. The technology has provided the interpreter with a very new and exciting package of tools that allow us to look at the seismic image as being truly representative of both the rock properties and the pore filling material. This course is intended to provide the users with a clear and useable understanding of the current state of these technologies. The focus of the course is on both understanding and application. Each topic in the course outline is reinforced by an exercise that gives the participants many practical and simple methods of integrating the course material into their everyday work. One personal computer is supplied, at added cost, for every two participants.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

3D Seismic Attributes for Reservoir Characterization

SPECIALIZED: 3 DAYS SARC

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

You will receive a copy of 'Essentials of Seismic Attributes and Impedance Inversion'. This book is a valuable resource with over 1,000 figures that effectively illustrate seismic attributes through examples. It covers theory, best practices, workflows, and case studies, while also highlighting potential pitfalls in interpretation.

COURSE CONTENT:

- Introduction to seismic attributes
- Quantiative seismic interpretation
- Coherence attributes
- Curvature attributes
- Seismic resolution and spectral decomposition
- Phase decomposition
- Bandwidtch extension
- AVO analysis and interpretation
- Seismic impedence inversion
- Gas storage and carbon sequestration
- Seismic attributes for shale resource plays
- Geothermal reservoir characterization
- Reservoir characterization case studies
- Seismic facies classification using unsupervised machine learning methods
- Attribute application recipes

TARGET AUDIENCE:

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

Advanced Seismic Stratigraphy: A Sequence-Wavelet Analysis Exploration-Exploitation Workshop

SPECIALIZED: 5 DAYS ADS

Seismic stratigraphy is a powerful tool for exploration and exploitation, especially when the rock-fluid information within the seismic wavelet (reflection character analysis) is integrated with the lithofacies-stratigraphic information, which is determined from reflection group geometry (sequence analysis). The methods used in this workshop do not rely upon either cosmetic processing or interpretation as an art; instead, practical methods of seismic stratigraphy are employed as a science, based upon firm, tested principles that are applied to a spectrum of tectonic structural styles and depositional environments. This rigorous, five-day course is a problem-oriented, hands-on workshop including significant group discussion and presentation. Participants learn how to make seismic modeling-interpretation judgments as a basis for seismic-facies and reflection character analysis. Case studies for exploration and development incorporate 2D and 3D seismic data with well data selected from around the world.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Geophysics

Applied Seismic Anisotropy for Fractured Reservoir Characterization

SPECIALIZED: 5 DAYS ASAF

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

COURSE CONTENT:

- Fundamentals of seismology: body waves that travel through a solid medium; reflection, refraction, mode-conversion
- Fundamentals of seismic anisotropy. P-P multi-azimuth, P-S multi-azimuth, S-S multi-azimuth
- Fundamentals of 3D full-azimuth seismic data acquisition; issues of cost, number of channels, geophones chosen, recording system, fold, etc.; VSP acquisition; multicomponent acquisition
- Fundamentals of seismic data processing: P-P multi-azimuth, P-S multi-azimuth, S-S multi-azimuth; requirements for processing sequences; necessity to comprehend the (chosen) contractor's definition of 'azimuth' and checks throughout processing to determine if the contractor is adhering to its definition of azimuth
- Fundamentals of seismic data interpretation for fractured reservoir analysis, and in-situ stress evaluation; commercially available software needed for multi-azimuth and/or multi-component 3D seismic interpretation
- Fundamentals of seismic data modeling for anisotropy, common (different) assumptions within different modeling packages
- Commercially available support data: where to find it, how to integrate the required support data
- Additional topics by request

TARGET AUDIENCE:

Geophysicists assigned to evaluate fractured reservoirs; also, geoscientists assigned to evaluate resource plays hydro-fractured for production. Multicomponent seismology, as well as azimuthal P-P, is offered in the course, because the recording of both the P- and the S-wave is extremely beneficial for fractured reservoir analysis and/or resource plays. The introductory lectures are also suitable for geologists and reservoir engineers who wish to know how seismic data can help them to understand the 'plumbing' of the reservoir and the in-situ stress state of the reservoir. The course is designed for the working interpretation geophysicist/geo-scientist, who is assigned to evaluate reservoir(s).

Use of Full Azimuth Seismic and Microseismic for Unconventional Plays

SPECIALIZED: 5 DAYS FAMS

For surface seismic, participants will learn to evaluate azimuthal seismic in fractured reservoirs or resource intervals needing hydro-fracturing. The course presents reflection seismic and microseismic acquisition-design, processing, interpretation, and integrating support data narrow-azimuth seismic, well logs, production tests, VSPs, and core work. For microseismic, participants will learn the strengths, weaknesses, limitations, and benefits of microseismic imaging of hydraulic fractures. "All young/old earth scientists in unconventionals need this course. I enjoyed thinking about the more complex levels of how to model AVO, and the azimuthal cases." - Geophysicist "Amazing, very knowledgeable and great instructor." - Geophysicist

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Petrophysics

Coring and Core Analysis

FOUNDATION: 5 DAYS CCA

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

Disclaimer
This course requires modifications for the Carbon Capture, and Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Foundations of Petrophysics

FOUNDATION: 5 DAYS FPP

Petrophysics is fundamental to all aspects of the petroleum business. This course will cover the principles, applications, and integration of petrophysical information for reservoir description in depth. Through a combination of exercises, participants will learn how to conduct competent quick-look evaluations. Using data from open hole logs, logging-while-drilling, and core data, participants will evaluate porosity, permeability, and saturation in various reservoirs. Learning to integrate petrophysical information with other data sources will enhance participants' ability to assess technical risk when examining hydrocarbon opportunities.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Geomechanics for Heavy Oil

FOUNDATION: 3 DAYS HOGM

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

COURSE CONTENT:

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

TARGET AUDIENCE:

Geoscientists and reservoir engineers involved in heavy oil plays.

Introduction to Geomechanics for Unconventional Reservoirs

FOUNDATION: 5 DAYS IGUR

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

COURSE CONTENT:

- Introduction to petroleum geomechanics
- Stress and strain tensors
- Deformation models and failure criteria
- Laboratory measurement of elastic and strength rock properties
- Mechanical behavior properties and key geomechanical aspects of shale plays (fractures, brittleness, and anisotropy)
- In-situ stresses and plate tectonics in the earth
- Effective stresses and the role of pore pressure in geomechanics
- Origins of pore pressure generation and different pore pressure measurement and calculation methods
- Review of different data sources for geomechanical characterization and the concept of integrated characterization
- Image log analysis and fracture characterization
- Construction of 1D and 3D mechanical earth models (MEMs) and their key characteristics
- Vertical stress characterization
- Introduction to Minifrac/DFIT analysis and key recorded pressures
- Basics of Integrated In-situ stress estimation (SHmax) using field tests, wireline logs, image logs, and seismic data
- Poroelastic modeling
- Frictional equilibrium and stress polygon
- Drilling history matching and borehole stability
- Data uncertainty analysis for geomechanical analysis
- Basic principles of hydraulic fracturing analysis and design
- Natural fracture characterization and DFN modeling
- Induced seismicity risk during hydraulic fracturing
- Introduction to data analytics and machine learning for drilling/completion/production optimization of unconventional plays

TARGET AUDIENCE:

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

Mud Logging

FOUNDATION: 5 DAYS MDLG

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Well Log Interpretation

FOUNDATION: 5 DAYS WLI

The most universal, comprehensive, and concise descriptive documents on oil and gas wells are logs. They impact the work of almost every oilfield group from geologists to roustabouts to bankers. Familiarity with the purposes and optimum applications of well logs is, therefore, essential for people forging their careers in the oil business. The instructor uses a novel approach to help participants develop a good grounding in understanding and applying well logging techniques. General principles of physics are presented to explain the functioning of modern logging tools. Wherever possible, the physics of logging measurements is related to everyday tools and applications. Participants develop an appreciation for the constraints and limitations of operating in the borehole environment. A number of actual log examples are related to basic principles in the description of reservoir properties such as porosity, mineralogy, formation factor, saturation, and hydrocarbon type for essentially clean reservoirs. Cross-plotting and reconnaissance techniques quickly and efficiently discriminate between water, oil, and gas. Participants gain realistic experience by working in teams on a comprehensive log interpretation exercise.

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

- Logging objectives
- Invasion profile
- Challenge of borehole geophysics
- Passive electrical properties of earth materials
- Resistivity measuring tools, normal, induction, laterolog
- Reservoir/non-reservoir discrimination
- Matrix-sensitivity logs, GR, SGR, Pe
- Depth measurements and control
- Borehole calipers
- Porosity-mineralogy logs, density, neutron, sonic
- Porosity determination in clean formations
- Formation resistivity factor
- Conductivity of shales
- Porosity log crossplots and mineralogy identification
- Partially saturated rock properties and Archie Equation
- Linear movable oil plot
- Reconnaissance techniques, Rwa, FR/FP, logarithmic scaler
- Porosity-resistivity crossplots
- Permeability relationships
- Nuclear magnetic resonance
- Use of pressure measurements
- Computerized log evaluation
- Sidewall coring
- Recommended logging programs

TARGET AUDIENCE:

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

Capillarity in Rocks

INTERMEDIATE: 3 DAYS CIR

This course covers conventional reservoirs. The course provides detailed knowledge of how capillarity affects hydrocarbon distribution in a reservoir rock, and how the magnitude of capillary forces can be used to deduce valuable information about rock properties including pore throat sizes, pore network geometry, porosity, and permeability. Several in-class exercises reinforce the course learning and provide students with experience using capillary pressure data for reservoir characterization. Exercises will be worked on the computer using spreadsheet software.

COURSE CONTENT:

- Capillary pressure applications in reservoir characterization
- Rock properties from mercury/air capillary pressures
- Capillary pressure data representativeness
- Capillary forces in reservoir rocks; their measurement
- Capillary pressure data fitting methods
- Representing / upscaling a large number of capillary curves
- Permeability from capillary pressure curves and petrography
- Saturation-height functions
- Surface phenomena, capillarity, wettability, and interphase tension
- Competition between capillary and gravity forces
- Imbibition cap curves
- Interpretation of single and multiple pore system rocks
- Clay-bound water
- Capillary pressure vs. NMR
- Seal capacity

TARGET AUDIENCE:

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

Integration of Rocks, Log and Test Data

INTERMEDIATE: 5 DAYS ILC

This course provides the background necessary to address the more complex reservoir evaluation and productivity challenges within exploration, field appraisal, and field development. The key fundamentals of rock properties, logging tools, and engineering data required to solve these problems are reviewed. The concepts are illustrated with a series of real world examples that become increasingly complex as knowledge is gained in the class. Emphasis is placed on solving problems in a workshop format. “Everything was just the right amount of depth. NMR and Capillary Pressure was fantastic! Shaly sands data integration was fantastic too!” - Geologist, United States “Right course at right time. Also I like the actual examples of seemingly misleading logs.” - Reservoir Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Nuclear Magnetic Resonance (NMR) Petrophysics

INTERMEDIATE: 4 DAYS NMRP

NMR today is a must-have technology for many companies because of the value-added to formation-evaluation. Some of the applications include: Matrix-independent, ‘sourceless’ porosity, low-resistivity/low-contrast, fresh-water reservoirs, and carbonates. NMR completes the formation-evaluation story for many companies now using the technology regularly because it either validates conventional log and test data or it independently provides an answer unavailable from other sources. Certainly, in many instances, the absence NMR data too frequently leaves the formation-evaluation story incomplete and uncertain. This four-day, PetroSkills NMR Petrophysics course will provide geoscientists and engineers with a basic to intermediate skill-level for using NMR data in reservoir characterization workflows. Course design is a balance between information transfer, discussion, training, and practical exercise. “In my opinion the course was very useful, well organized and the professor did a great job. It improved my knowledge of the subject and gave me tools to better work this kind of data once back in the office.” - Operations Geologist, Spain

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Petrophysics of Unconventional Reservoirs

INTERMEDIATE: 3 DAYS PUR

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Shaly Sand Petrophysics

INTERMEDIATE: 5 DAYS APS

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

Disclaimer
This course requires modifications for the Carbon Capture, and Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Applied Rock Mechanics

SPECIALIZED: 3 DAYS ARM

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

COURSE CONTENT:

- Introduction to rock mechanics and geomechanical principals
- Basic mechanics: stress and strain, elasticity (linear and non-linear effects, brittle and ductile rock behavior, poroelasticity, time-dependent-effects), consolidation and creep, normal and shear forces, hoop stresses, the Kirsch solution, 2D and 3D stress components, tensors, the stress ellipsoid, and basic rock failure (Mohr-Coulomb theory)
- Rock mechanical properties: ability to bear stresses (compressive strength, tensile strength, deformation response to stresses), elastic moduli, Poisson's ratio
- Pressure, stresses, and loads: principal stresses, in-situ stress regime, total-stress and effective-stress, temperature effects, nature, and origin of pore pressure
- Geomechanics and structural geology: faulting and folding, tectonics, regional structural analysis, regional and localized stress
- Wellbore and field measurement of in-situ (earth) stresses: stresses around boreholes, overburden stress, horizontal stresses, leakoff tests, mini-frac tests, formation testers, other pressure transient techniques, and tool deployment
- Overview of common rock mechanics tests (lab demonstrations): unconfined compression, triaxial compression, hydrostatic compression, poly-axial, multi-stage triaxial, thick-walled cylinder, direct tensile strength, indirect (Brazilian) tensile strength, direct shear, uniaxial strain (compaction), and quick look (rock hardness) and scratch tests
- Stress orientation techniques: geological/mapping methods, wireline logging techniques, analastic strain recovery, differential strain curve analysis, acoustic anisotropy
- Elastic, plastic, and viscous models of rock behavior: deformation mechanisms and common models used in petroleum related rock mechanics
- Borehole stability: borehole stresses, wellbore placement, shale characterization, review of borehole stability models, high angle and horizontal drilling, pilot hole evaluation, multi-lateral wellbores, borehole breakouts, fluid-related instability, drilling through depleted zones and casing shoe decisions, stuck pipe, and case histories (software demonstration)
- Sand control: review of sand production mechanisms, completion techniques in unstable formations, gravel pack design, special liners and screens, and case histories
- Fracture mechanics: naturally fractured reservoirs, hydraulic fracturing, stimulation options, and case history
- Unconventional reservoir applications
- Reservoir engineering applications: compaction drive, reservoir compaction and compressibility, subsidence, casing shear, depletion and effective stress, and case history
- Wireline log predicted mechanical properties: density logging, acoustic logging, Biot theory, dipole and multi-pole (dynamic) acoustic logging, seismic data and Amplitude Versus Offset (AVO), and shear- and compressional-wave anistropy (lab demonstration)
- Data integration

TARGET AUDIENCE:

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

Cased Hole Formation Evaluation

SPECIALIZED: 4 DAYS CH

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Wireline Formation Testing and Interpretation

SPECIALIZED: 5 DAYS WFT

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Surface Production Operations

BASIC: 5 DAYS PO3

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Well Stimulation: Practical and Applied

BASIC: 5 DAYS WS

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Artificial Lift Systems

FOUNDATION: 5 DAYS ALS

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

COURSE CONTENT:

- Overview of artificial lift technology
- Selection criteria
- Reservoir performance
- Artificial lift screening
- Economic analysis
- Rod pump, gas lift, and ESP equipment selection and design
- Best practices for each system

TARGET AUDIENCE:

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

Completions and Workovers

FOUNDATION: 5 DAYS CAW

The course offers an integrated introduction to various aspects of completion and intervention technology. The material covers major design, diagnostic, and intervention technologies, and concludes with common remedial measures. Emphasizing the practical aspects of each technology, the course uses design examples—both successes and failures—to illustrate key points and highlight risks and uncertainties. The overall objectives are to deliver and maintain well quality. Participants will become familiar with many aspects of modern completion design as well as a variety of workover technologies. This broad-based course includes both conventional and unconventional wells, with a focus on design and selection.

COURSE CONTENT:

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

TARGET AUDIENCE:

Graduates or engineers with experience, engaged in drilling operations, production operations, workover, and completions; applicable for engineers working in either the service or operating sectors.

Downhole Remediation Practices for Mature Oil and Gas Wells

FOUNDATION: 5 DAYS DRP

Downhole Remediation for Mature Oil and Gas Wells is presented from a practical point of view. Discussions include decision processes for selection, design, and application of methods that are supported by field experiences and research results. Principal focus is production-related near wellbore damage and remedial water control practices. "Enjoyed learning the chemistry, physics behind many common industry practices and best practices." - Petroleum Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

Asset managers, drilling and completion engineers, petroleum engineers and geologists, independent producers, production managers and engineers, reservoir managers and engineers, field supervisors, company executives and officials, field personnel with operating and service companies.

Operations and Development of Surface Production Systems

FOUNDATION: 10 DAYS PO4

This course trains the participant to effectively develop and operate an upstream surface production system. The instructor uses his long training/coaching experience to support through this course the development of production operations professionals by enhancing their skills in understanding and solving problems within the integrated surface production system. Practical application of surface production practices is emphasized. Interactive discussions are generated along with examples and class exercises. Initially, participants will work as a team in short hands-on exercises that reinforce the lectures. Later on, participants arranged as a technical team will work on an Integrated Surface Production System (ISPS) team assignment. The result of this ISPS project will be presented during the last day of the program. Note that 75% of this course is hands-on team assignments. This course program will lay a solid foundation of the skills, knowledge, and self-awareness required to develop further into fully competent Production Operations Professionals.

COURSE CONTENT:

- Applied principles of oil and gas surface operations
- Characterization of petroleum fluids
- Two-phase oil and gas systems
- Two-phase separation operations and selection procedures
- Oil-gas-water interaction principles and emulsions
- Three-phase separation operations and selection procedures
- Upstream crude oil treating operations and selection procedures
- Crude oil dehydration, desalting, sweetening, and stabilization
- Produced water treating operations and selection procedures
- Transportation of petroleum fluids
- Pumps and pumping systems
- Pressure vessels requirements
- Upstream natural gas treating operations and selection procedures
- Acid gas treating, gas dehydration, and removal of other contaminants
- Compressors and compression systems
- Production delivery assurance and maintenance
- Measurements in oil and gas operations
- Integrated surface production system team project
- Project final presentation

TARGET AUDIENCE:

Production and technical professionals engaged in upstream operations and development, petroleum engineers, team leaders, production operators, technical assistants, senior technicians and field supervisors, production and development technical professionals, and newly hired field engineers. The course is also designed for all technical operating personnel who want to get a solid foundation in principles, challenges, and solutions for upstream surface production systems.

Performance Analysis, Prediction, and Optimization Using Nodal Analysis

FOUNDATION: 5 DAYS PO2

Nodal analysis views the total producing system as a group of components potentially encompassing reservoir rock/irregularities, completions (gravel pack, open/closed perforations, open hole), vertical flow strings, restrictions, multi-lateral branches, horizontal/hilly terrain flow lines/risers, integrated gathering networks, compressors, pump stations, metering locations, and market/system rate/pressure constraints. An improper design of any one component, or a mismatch of components, adversely affects the performance of the entire system. The chief function of a system-wide analysis is to increase well rates. It identifies bottlenecks and serves as a framework for the design of efficient field wide flow systems, including wells, artificial lift, gathering lines and manifolds. Together with reservoir simulation and analytical tools, Nodal analysis is used in planning new field development. Initially, this technology was applied using pressure traverse curves and simple PI models. Now state-of-the-art software programs have enabled a well-trained engineer to concentrate on matching field data, interpreting results, and understanding a system's interdependencies. Software is used extensively during the class and the participant is encouraged to bring his/her own laptop and nodal software. However, if the attendee chooses not to supply his/her own software, nodal analysis, and gas deliverability planning programs can be provided. One personal computer is provided, at additional cost, for each two participants. Alternatively, a NODAL Analysis Workshop is available via PetroAcademy. "The real world examples helped us (having to identify errors on reports). Also using SNAP to solve the problems and get experience using computer models." - Drilling Engineer 1 "The instructor made the class interesting, applicable, and enjoyable. He knows his stuff!" - Petroleum Engineer

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Production Operations 1

FOUNDATION: 10 DAYS PO1

This course is the foundation course of PetroSkills' production engineering curriculum and serves as the basis for future oilfield operations studies. Participants will become familiar with both proven historical production practices and current technological advances to maximize oil and gas production and overall resource recovery. The course structure and pace apply a logical approach to learning safe, cost-effective, integrated analytical skills for successfully defining and managing oil and gas operations. These applied skills provide a framework for making careful, prudent, technical business decisions in the oil and gas industry. The course also covers emerging practices in the development of unconventional resources, including shale gas and oil, heavy oil, and bitumen, complementing the broad and specific coverage of conventional resource extraction.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Production Technology for Other Disciplines

FOUNDATION: 5 DAYS PTO

This is an asset team course that introduces a broad array of essential daily Production Technology practices to team members. It covers terminologies, expressions, axioms, and basic calculations regularly used by Production Technologists. The course emphasizes proven technology required to effectively develop and operate an asset in a multidisciplinary development environment.

The practical application of technology is a key focus. Both theory and real-world field examples and well completion programs are studied, along with class problems, exercises, and videos. Nodal analysis examples are set up to assess well performance. Well completion equipment and tools are viewed and discussed. Participants engage in several exercises, such as basic artificial lift designs, acidizing programs, gravel pack designs, and fracturing programs. The course thoroughly explains the challenges of shale gas and oil development and presents horizontal and multilateral technology.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Unconventional Resources Completion and Stimulation

FOUNDATION: 5 DAYS URCS

Horizontal wells have become the industry standard for unconventional and tight formation gas reservoirs. Because these reservoirs have poorer quality pay, it takes a good, well-planned completion and fracture stimulation(s) to make an economic well. Even in a sweet spot in the unconventional and tight gas reservoir, good completion and stimulation practices are required; otherwise, a marginal or uneconomic well will result. But what are good completion and stimulation practices in horizontal wells in these unconventional reservoirs? What are the objectives of horizontal wells and how do we relate the completion and stimulation(s) to achieving these goals? How many completions/stimulations do we need for best well performance and/or economics? How do we maximize the value from the horizontal wells? When should a horizontal well be drilled longitudinally or transverse? These are just a few questions to be addressed during this course. This course will focus on some of the key elements of well completions and stimulation practices as they apply to horizontal wells in tight and unconventional reservoirs. Optimization studies will be shown and used to highlight the importance of lateral length, number of fractures, inter-fracture distance, fracture half-length, and fracture conductivity. These results will be used to discuss the various completion choices such as cased and cemented, open hole with external casing packers, and open hole pump and pray techniques. This course also will address key risks to horizontal wells and develop risk mitigation strategies so that project economics can be maximized. In addition, tight and unconventional gas field case studies will be used to illustrate the application of these design, optimization, and risk mitigation strategies for horizontal wells in tight and unconventional gas reservoirs. "I liked learning about the practical applications and how to use theory and diagnostic tools in practice." - Petrotech Engineer I, United States "Very thorough overview of the entirety of the completion/stimulation process. Great course!" - Reservoir Engineer

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Unconventional Resources Completion and Stimulation Diagnostics

FOUNDATION: 5 DAYS URCSD

Tight and unconventional resources have poorer quality pay than more conventional resources, therefore, it takes a good, well-planned completion and fracture stimulation(s) to make an economic well. Historically, fracture diagnostic technologies were utilized to assess the achieved fracture dimensions and used to calibrate fracture models for future designs and as an aid in treatment optimization. In vertical well applications the work flow for such studies is well understood and documented. In tight and unconventional reservoirs where wells are completed as multiple fractured horizontal wells the application of diagnostic fracture technologies is less clear. Good reservoir, completion, and stimulation practices are required; otherwise, a marginal or uneconomic well will result. But what are good completion and stimulation practices in horizontal wells in these unconventional reservoirs? How do we assess the completion efficiency and effectiveness? How do we determine the resulting fracture dimensions (length, conductivity, and height)? How do you design and implement a diagnostic program to capture the key drivers of horizontal well completion and stimulation success? Ultimately, it is important to maximize the utility of any fracture diagnostic data collection and broaden the application of the results from the well where the data was collected to other wells throughout the field. Leveraging data collection and application in this fashion benefits from and requires the consistent use of routine data collection and analysis (inexpensive well by well collection) prior, during, and after well stimulations. Additionally, these diagnostic data collections should be used with tools such as fracture and reservoir models to properly apply the physics and relate the learnings from well to well. This course will focus on the key completion and fracture stimulation diagnostic technologies and techniques. These technologies and techniques include the use of far field technologies, near wellbore technologies, indirect diagnostic technologies, and more importantly the integration of multiple diagnostic techniques. The pros and cons of each diagnostic technology and application will be discussed. Tight and unconventional case studies will be used to illustrate the application of the diagnostic technologies and methods to the assessment of the completions and fracture stimulations. Example problems will be worked throughout the course both individually and as a group in order to reinforce the class learnings.

COURSE CONTENT:

- The history of completion and fracture diagnostics
- The pros and cons of Far-Field Mapping Technologies (surface and downhole tilt-meters and micro-seismic) for completions and fracture stimulation analysis
- The pros and cons of Near Wellbore Diagnostics (radioactive and chemical tracers, borehole imaging, downhole videos, production logs, temperature logs, DTS, and DAS)
- The effect of hoop stresses on application of near wellbore diagnostics
- The pros and cons of Indirect Diagnostic Technologies (Fracture pressure analysis, build-up testing, fall-off testing, rate transient analysis, and production data analysis)
- Integrating diagnostic technologies & techniques
- Designing a completion and fracture stimulation diagnostic program

TARGET AUDIENCE:

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

Acidizing Applications in Sandstones and Carbonates

INTERMEDIATE: 5 DAYS ASC

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Artificial Lift for Unconventional Wells

INTERMEDIATE: 5 DAYS ALUW

This course addresses artificial lift methods and practices for unconventional wells for oil and gas producers, as well as associated industry service providers and contractors. The focus of the course is optimizing value from upfront well planning through the end of life of unconventional wells by selecting, installing and operating artificial lift effectively. Upon completion of this course, the participant will understand how to choose and implement artificial lift and be able to utilize best practices to resolve and reduce issues and challenges that frequently occur during the life cycle of unconventional wells. The course focuses on optimizing production and recovery by ensuring the proper artificial lift technology is used in conjunction with optimum surface pressure and related facilities in a holistic approach. Participants will understand the steps necessary to develop an effective artificial lift strategy for wells specific to areas/plays. This course incorporates a combination of about 50% instruction and 50% facilitated problem-solving utilizing real or realistic well/field data to select and stage the appropriate lift methods. The problem-solving sessions include both individual and group activities that will provide each participant with a hands-on application of the methods, principles and practices discussed throughout the course. Also, all participants will be asked to bring a challenge they are currently facing in artificial lift for unconventional wells and will present the challenge (Day 2) and their path forward based on what they have learned (Day 5).

COURSE CONTENT:

- Artificial lift objectives, value, rate and recovery, cost
- Differences between conventional and unconventional wells
- Applying Nodal Analysis and using IPR curves for artificial lift selection in unconventional wells
- Selecting the optimum artificial lift method, rod pumps, plunger lift, ESP or other
- Developing a comprehensive artificial lift strategy

Application Problems The course will include practical application problems using unconventional well/field data to:

- Analyze options and select an optimal artificial lift method
- Size/optimize each major artificial lift method
- Solve or determine a path forward toward solution on one real world problem from each participant
- Using given data, determine a holistic strategy to optimize the value of applying artificial lift over the life of wells in an area/field/play

TARGET AUDIENCE:

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

Beam Pumps

INTERMEDIATE: 5 DAYS BP

This course will allow the user to become familiar with the beam pump system and its best application. Beam pumping is the most common and cost-effective artificial lift method. The course includes a detailed description of all the components in a beam pumping system, including the prime mover, belts/ sheaves/ gear box, PRs, wellhead/ stuffing box, sucker rods/ sinker bars and downhole pumps. Design and analysis, using industry computer software is also included. Exercises designed to illustrate the process and decision-making criteria to select the optimum lift method will be worked by participants throughout the course. Problems related to solids production, gas handling, and viscosity are addressed. The course also covers beam pumps and rod protection in horizontal wells, optimum placement of the pump, deviation surveys, and performance of gas separators. New methods of deepening the point of intake for horizontal and unconventional wells are presented with field cases.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Electrical Submersible Pumps

INTERMEDIATE: 5 DAYS ESP

ESPs have advantages over some of the other artificial lift methods because they can generate a higher formation drawdown and achieve a higher rate. However, their performance is impacted by gas interference and formation sand production, both of which have to be addressed when setting ESPs in production wells. This course will familiarize the user with the ESP system and it's optimum application. All components will be described in detail. The course uses computer software for numerous design and analysis class problems. Some films will be shown to illustrate installation, operation, and removal of failed equipment, new products, and best practices. Discussion is encouraged concerning experiences of successes and failures. Comparisons are made to other lift methods to help facilitate the optimum method selection. Problems related to solids production, gas handling and viscosity are addressed. Best practices are stressed throughout so that a long lasting system can be designed to achieve optimum well performance. SCADA controls and VSDs are discussed. Participants will learn the function of each component, and important considerations about installation, operation, and removal of failed equipment. Participants will be able to evaluate the design of a system for current and future conditions, analyze an installed system, and review multiple operational aspects of the ESP system. Although the course uses industry computer software for design and analysis, much of the material is devoted to best practices, which is useful to both engineers and technicians. Deviation is not such a problem with ESPs but is discussed nonetheless. The common practice of using ESPs in unconventional wells with sharply declining production rates is also discussed.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Flow Assurance for Offshore Production

INTERMEDIATE: 5 DAYS FAOP

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Formation Damage: Causes, Prevention, and Remediation

INTERMEDIATE: 5 DAYS FD

Formation damage seems to be inevitable and it is costing your company money! Whether formation damage can be prevented, removed economically, or must be accepted as the price for drilling and producing a well will depend upon many factors. Concerns for formation damage have been with our industry from the early days. These concerns become more prevalent as we embark on more challenging reservoirs utilizing even more challenging drilling, completion, and production methods. Additional concerns relate to the common lost production or injectivity following workovers in these challenging environments. These subjects and many more are addressed in this fast-paced, informative course covering all aspects of formation damage. Examples, case histories, and class team exercises are used throughout the course to emphasize key points on this important industry subject. This subject is briefly covered in the PetroSkills Production Operations 1 course (Foundation Level) as well as in the Well Stimulation: Practical and Applied (Basic Level) course. However, this course is more concentrated, detailed, and applied in the subject matter than either of the other courses. "Liked acidizing and details on clays. Knew about clay swelling as potential problem. Did not know about migrating clays." - Production Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Gas Lift

INTERMEDIATE: 5 DAYS GLI

Gas lift is one of the most widely used artificial lift techniques. Participants will investigate the impact of tubing sizing, gas lift valve selection, gas lift mandrel spacing, gas lift valve design, casing pressure, surface choke size, gas volume, etc., on well design and operation. Participants will practice mandrel spacing design and gas lift valve design, surveillance, and optimization at the well and field level using actual field data including the use of software programs. After attending this course, participants will be able to identify, diagnose, analyze, and solve gas lift problems. Computer software will be used/demonstrated during the course. The class includes pictures and videos of most important equipment components while being applied, to further participant understanding. This course emphasizes techniques to maximize production. New developments at various stages of development and application are also covered. "Liked hands-on approach, manual calculations and low reliance on software." - Reservior Engineer, India "Every part of the course I like. In my opinion course covers every important topic." - Petroleum Enginer, Croatia

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Gas Production Engineering

INTERMEDIATE: 5 DAYS GPO

Learn the latest methods for calculating gas well performance from reservoir to sales. Reservoir performance covers the fundamentals of reservoir gas flow and details the best methods for testing wells, according to the time and money available. Reserve calculations and diagnostic testing from production data are covered. The importance of flow regime and non-Darcy flow on test design and interpretation is emphasized for new wells and for the possibility of improving the performance of older wells. Also discussed are performances of tight formations, horizontal wells, fractured wells, and methods for estimating gas reserves. Participants will learn to calculate and determine the effect of each system component on total well performance, which permits optimum sizing of tubing, flowlines, separators, and compressors. Problem-solving sessions allow participants to evaluate field problems. Participants receive complimentary software at the end of the course. "The practicality of the course was great. Great examples and step by step procedures." - Production Engineer, United States "Best PetroSkills course I've taken. Accessible theoretical concepts behind some every day production engineering aspects." - Production Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Gas Well Deliquification

INTERMEDIATE: 5 DAYS GWD

As gas wells deplete, the velocity in the tubing drops and eventually liquids from the well and from condensation begin to accumulate in the tubing. This increase of liquids in the tubing adds back pressure on the formation, which in turn reduces flow or even stops flow all together. The course introduces this problem and discusses how to recognize liquid loading as opposed to other possible well problems. The course will then cover the various methods of solving the problem of liquid loading, showing how to apply the various solutions and the advantages and disadvantages of each method. Solution methods include use of surfactants, velocity strings, compression, use of plunger lift, various other pumping methods, gas lift, and the injection of fluids below a packer so gas can flow up the annulus. Participants will learn to recognize the problems and symptoms of liquid loading and determine which methods can solve the problem and select the optimum method/s after attending the course. There are about 400,000 gas wells in the USA and most are liquid loaded. Solving this problem may on the average increase production by ~40% per well. The course will consist of slide presentations, example problems, and discussion. Some films will be shown. Effects of deviated or horizontal well applications on all methods are discussed. Special considerations for the use of each system in unconventional or horizontal wells are also discussed. "Good to get a general overview of different lift methods available." - Production Engineer, United States "Liked plunger lift the most. Because I am treating tight gas/ oil wells and there are a lot of workover jobs especially plunger lift." - Reservoir Engineer, South Korea

COURSE CONTENT:

- Recognize symptoms of liquid loading in gas wells
- Critical velocity to analyze wells loading or not
- Optimize techniques with Nodal Analysis
- Sizing tubing
- Compression: Selection, sizing, and operation
- Plunger lift: Continuous (bypass), conventional and gas assisted
- Use of foam to deliquefy gas wells
- Hydraulic pumps
- Use of beam pumps to deliquefy gas wells
- Gas lift
- Electrical submersible pumps
- Progressive cavity pumps
- Other methods to solve liquid loading problems

TARGET AUDIENCE:

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

Hydraulic Fracturing Applications

INTERMEDIATE: 5 DAYS HFU

The course reviews the basic concepts of hydraulic fracturing and the broad applications of the technique. Fracturing technology benefits and limitations in all types of sandstone and carbonate reservoirs are explained. It considers the critical components of the fracturing process, and it expands on the steps and data input requirements to effectively select stimulation candidates, plan, design, and implement hydraulic fracturing treatments. The use of modeling as an important tool to design and analyze treatments, how it can be effectively used in practical applications, and its limitations are explained. In addition to the technical presentation, the course contains many practical exercises and class problems based on case histories. "Enjoyed coverage of current events and trends - slickwater fracs, shales, etc." - Engineering Manager "I liked that we learned in detail about surface treating pressure and all 5 of its components. It will now be easier to interrupt frac post job reports." - Completions Engineer

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Plunger Lift

INTERMEDIATE: 5 DAYS PLS

There are about 400,000 gas wells in the USA and most are liquid loaded. Solving this problem may increase production as much as ~40%. Plunger lift is a very popular method of gas well dewatering as it is initially inexpensive, has a long operating life and requires no power to operate in most wells. Each component of a plunger lift system is described in detail, and tools for analysis are provided to participants. Several methods of cycles analysis, including analysis by shape of the SCADA traces of CP, TP, rate, and LP are discussed and applied throughout the course using a spreadsheet provided to participants to estimate the cycle slug size, the CP required to lift it at the correct speed, the minimum time for shut-in for the plunger to fall, the maximum liquid possible, the cycle times, and other information on the plunger cycle. Proven methods of how to adjust cycles to increase production are presented. Details about plunger lift operation are covered, with emphasis on trouble free cycles and more gas production. Continuous (bypass), conventional, gas assisted and casing plunger lift are presented. Special equipment and techniques used in unconventional or horizontal wells are discussed, as well as the effect that well deviation has on system operation.

COURSE CONTENT:

- Introduction to methods to solve loading problems
- Lifting capability comparison between Plunger Lift and other artificial lift methods
- Continuous Plunger Lift
- Conventional Plunger Lift
- Trouble shooting using decline curves, SCADA traces, and cycle set points
- Drawdown capability of plunger lift
- IPRs for plunger lift
- Systems used to monitor plunger in the well
- What systems to use when conventional plunger no longer works

TARGET AUDIENCE:

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

Production Chemistry

INTERMEDIATE: 5 DAYS OGPC

This course covers the selection and use of chemicals in oil and gas production. As oilfields mature more water is produced which requires the use of more chemicals to maintain production. Chemicals used for controlling corrosion, emulsions, foaming, mineral scales, paraffins (waxes), asphaltenes, gas hydrates, hydrogen sulfide scavengers, and water clarifiers are covered. The course includes methods to determine the need for chemical treating, how to select the proper chemicals, and how testing for chemical compatibility with the formation and other chemicals is performed. Requirements for environmentally friendly products and products for deep water production are discussed. The course will include cover the ways the use of chemicals can prevent problems, improve production and economics, and extend the life of the production equipment. Due to its modular construction, this course can be offered on an in-house basis with expansion of some of the major sections and deletion of others to suit the needs of individual client groups. Should you desire this approach, please contact us. "The amount of time we spent on each subject was good. Discussions are very practical." - Production Engineer, United States "Liked corrosion part (control, origin of corrosion). The best teacher to date." - Participant, Croatia

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Production Logging

INTERMEDIATE: 5 DAYS RMP

Production logging involves acquiring a suite of logging measurements in production or injection wells to evaluate well or reservoir flow performance. Special-purpose production logging tools can evaluate the well completion or look behind the pipe to evaluate the formation and its fluids near the wellbore. Production logs are increasingly important in modern reservoir management, providing the only means of directly identifying downhole fluid movement.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Sand Control

INTERMEDIATE: 5 DAYS SNDC

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

COURSE CONTENT:

- Sand control techniques
- Radial flow and formation damage
- Causes and effects of sand production
- Predicting sand production
- Gravel pack design
- Slotted liners and wire wrapped screens
- Gravel pack completion equipment and service tools
- Well preparation for gravel packing
- Perforating for gravel placement techniques
- Perforation prepacking and enhanced prepacking
- Frac packing
- Open hole gravel packing
- Expandable screens
- Gravel pack performance
- Horizontal well completions

TARGET AUDIENCE:

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

Advanced Hydraulic Fracturing

SPECIALIZED: 5 DAYS AHF

This advanced course is designed for those who have a practical understanding of the applications of hydraulic fracturing and want to expand their knowledge. The course provides the details and discussion of fracturing concepts usually accepted or assumed in fracturing applications both for conventional and unconventional reservoirs. The strengths and limitations of various approaches to fracturing treatment design are also covered. Attendees should leave the advanced course with a better understanding of the hydraulic fracturing process. They will have evaluated a vertical well as teams to determine the appropriate stimulation, its execution and how best to evaluate the results. In addition, they will also evaluate an unconventional horizontal well to determine the type completion to be employed as well as the stimulation technique.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Horizontal and Multilateral Wells: Completions and Stimulation

SPECIALIZED: 5 DAYS HML2

Successful multilateral and horizontal wells require new considerations, interdisciplinary planning, and special techniques. This intense course focuses on the critical need for a proper understanding of all aspects of horizontal and multilateral design and completion. It also addresses basic stimulation design and analysis concepts. It is designed for those planning or working with horizontal and multilateral wells and interested in effective use of the latest technology. Basic understanding of important reservoir characteristics, hole stability, formation damage, crucial zonal isolation, and hydraulic fracturing are just some of the critical issues addressed by this course. Hydraulic fracturing aspects of unconventional resources plays, including conductivity, proppant selection, and practices, are discussed. A combined practical and technical theme is employed, with emphasis on economy and efficiency in designing, completing, and producing horizontal and multilateral wells. "The group project was good for collaborating and I like how it built on the learnings in the class. Good well rounded class. Thanks!" - Completions Engineer, United States "I have attended many courses. I have never enjoyed one more." - Operations Engineer

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Process Safety / Well Operations Integrity

SPECIALIZED: 5 DAYS PSWOI

The objective of this seminar is to show and explain to Oil and Gas Operators the importance of the Integrity Process and the variables to be considered throughout the "Life Cycle of the Well" as part of the assurance processes in Oil and Gas Operations. Drilling, Completion, Intervention and Production (ISO 16530-1; Oil and natural gas industries – Well Integrity - Part 1). Considerations when designing wells; critical drilling and completion equipment, problems arising in well production and injectors; and what are the barrier considerations. Importance of involving the different Technical and Multidisciplinary Drilling, Production, Interventions, Reservoirs and Geology Teams before designing and drilling the well. Consider other variables in the initial well design and mitigate subsequent risks such as annular pressures, isolation between zones and corrosion problems. Also, the most common problems that can be identified during well construction and how they directly impact the different subsequent phases of well completion and production operations.

COURSE CONTENT:

- Review the importance of having an Integrity Management System that covers the different phases of the Well Life Cycle.
- What aspects should be considered when designing and building the well?
- Benefit in the production of oil and gas when the wells do not present integrity problems.
- Reinforce the key variables of Well Integrity to be considered by Engineers from different disciplines.
- Well Integrity Management Process
- Hazard Identification and Risk Assessment
- Assurance in Drilling and Completion operations.
- Cementing of wells
- Barriers and isolation between zones.
- Review of the state of wells (Analysis of the load cases- examples of the operator with real data).
- Management of annular pressures
- Abandonment of wells

TARGET AUDIENCE:

This course is designed to show the importance of having processes established within the organization for the management of Well Integrity using the available tools and applying them to operations through the "Life Cycle" of wells (Design, Drilling, Interventions, Production and Abandonment Operations). Review the techniques and variables of risk identification and evaluation, reinforcing through operational examples the analysis of consequences of possible well integrity events. Engineering concepts are reinforced during drilling, completion, barriers, cementation, and isolation between zones. Analysis of Wellcat results based on current operating company wells if available and review with engineering and operations teams to identify issues and possible causes of integrity issues. Analysis of annular pressures and their management according to the maximum operating pressures. How to abandon wells using information and policy standards (API 16530/ Norsok).

Petroleum Project and Program Management Essentials

FOUNDATION: 3 DAYS P3ME

Petroleum companies often use projects to develop the skills of early career project professionals. This course covers the essential skills of petroleum project and program management and provides an opportunity to apply those skills to your project. You will be able to utilize fit-for-purpose prioritization techniques and control tools to facilitate successful outcomes. The specific training received in planning, scheduling and risk management will help the early career professional make the best decisions possible. Participants will learn how the project management, HSE, engineering, operations, maintenance, procurement/supply chain, and transportation disciplines relate to one another and what tools are available to ensure interfaces among key stakeholders are managed. The course is taught using a combination of instruction, facilitated discussion, and team exercises using real-world examples related to facilities, drilling and maintenance. The exercises will include both individual and group activities that will provide each participant with a hands-on application of the principles and practices discussed throughout the course. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

- The petroleum project delivery system
- Organization and resources
- Project coordination
- The execution plan
- HSE and risk management
- Procurement and contracting
- Cost management
- Planning and scheduling
- Progress measurement
- Program management essentials

TARGET AUDIENCE:

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

Project Management in Upstream Field Development

FOUNDATION: 3 DAYS FPM2

A project does not stand alone. Not only does a project manager need to stay focused on project cost, schedule and performance targets, he or she must take a broader view. Many projects are a part of a larger field development program. Maintaining cadence among related projects is essential to success. This course will help you effectively deliver facility and infrastructure projects that are crucial for timely oil and gas production. Upon completion, you will know how to: Use fit-for-purpose project management control tools for good project results. Work the project management, drilling and completion, HSE, land, production, and transportation disciplines together for success Control interfaces among different projects and contractors This course addresses key requirements for repetitive projects in oil and gas programs. Emphasis is on both conventional and unconventional resources, such as shale oil and coal bed methane. The course is taught using a blend of instruction, guided discussion, and hands-on exercises based on the instructor's petroleum successes and failures. "Overall the course was well instructed and a lot of PM principles can be applied to other types of projects such as offshore. Excellent job by the instructor!" - Researcher, United States This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Managing Brownfield Projects

INTERMEDIATE: 5 DAYS FPM42

Why is it so difficult to manage projects inside operating facilities? Keeping the scope from growing is a constant battle. Operations priorities and maintenance needs hamper work productivity. To be successful, brownfield projects need strong control, effective liaison, and good interface management. Experienced instructors will share tools and techniques that will help you work in this dynamic, operations-centric project environment. Upon completion you will know how to: Examine existing documentation and confirm field conditions to improve scope control Frame a project and select the best concept for development Coordinate the work effectively with operations, maintenance and shipping Instruction, guided discussion, and in-depth work tasks based on the instructor's brownfield project management experience are used. The sharing of experience in this course make the sessions challenging and insightful. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

Disclaimer
This course requires modifications for the Geothermal discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

This course is for team members that work on projects installed in existing facilities. Engineers, operations leads, and maintenance reps should attend. Services personnel in cost, schedule, procurement, and quality functions will also benefit. This course helps business, commercial and finance and other non-engineers who want a greater awareness of brownfield project challenges.

Petroleum Project Management: Principles and Practices

INTERMEDIATE: 5 DAYS PPM

Successful petroleum operations need a blend of technology, business savvy, and people skills. If you have a firm grasp of exploration or production technology, boost its impact by applying project management techniques. Running a staged program that integrates reservoir modelling, production estimating, drilling, and facility design is challenging. The tools and techniques covered in this course will help you meet that challenge. Upon completion, you will know how to: Make better decisions in field development that lead to high value and low cost Develop integrated plans to run the overall program Develop key deliverables for each stage of development to reduce uncertainty Instruction, guided discussions and in-depth work tasks are used. You may choose a case study from several real-life situations that are based on the instructor's petroleum experience. Or you may bring the details of one of your own current programs. "Lecturer was very passionate to teach and answer our questions." - Project Coordinator, Japan This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

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

TARGET AUDIENCE:

Exploration and production personnel with a background in geoscience, petroleum engineering or drilling should attend. If you are a facilities engineer, we refer you to our Project Management for Engineering and Construction (FPM22) and Project Management for Upstream Field Development (FPM2) courses.

Project Management for Engineering and Construction

INTERMEDIATE: 5 DAYS FPM22

Many petroleum projects fail to meet their authorized cost, schedule or operability targets. To be successful, today's project leader needs a comprehensive set of technical, business and interpersonal skills. This course addresses those critical skills. Seasoned instructors tackle the issues and challenges found in concept selection, development planning, facility design, procurement, and construction activities. The specific training received in schedule and cost management, risk mitigation, and the proper use of scarce resources (people and materials) will help you make better decisions. Upon completion, you will know how to: Improve engineering and service discipline work relations Use execution plans to integrate the work Effectively employ cost and schedule control tools This course is taught using a combination of instruction, facilitated discussion, and in-depth exercises based on the instructor's petroleum development successes and failures. "Liked everything about the course." - Research Tech, United States "Great facilitator. Knowledge of subjects, good stories, good use of knowledge of the class." - Productivity Engineer This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

Disclaimer
This course requires modifications for the Geothermal discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Risk Management for Capital Projects

INTERMEDIATE: 5 DAYS PMRM

This five-day, intermediate level course for project managers, project engineers, and integrated project team discipline members addresses the key areas associated with capital project risk management. The course focuses on managing risk throughout the entire project life cycle. This course is very much hands-on with class exercise case studies that focus on participant development of risk management deliverables. The class also addresses the methods that project team leaders can utilize to ensure that project team members and management buy in and are part of the risk management process. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

Disclaimer
This course requires modifications for the Geothermal discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

Project managers, project engineers, and all disciplines that work on integrated project teams for petrotechnical projects, upstream onshore, and offshore developments. Case studies include complex projects that require significant infrastructure investment.

Systems Completion, Commissioning and Start-up

INTERMEDIATE: 3 DAYS CSU

This course will show you how to be successful in the defining phase of a project. Did you know that from the perspective of an investor, it is the Commissioning & Start-Up (CSU) phase that defines the project as a success or failure? When a project has been fully commissioned and started-up, it is likely the project will also be a financial success, with investors receiving their expected returns. When a project has not been fully commissioned and is then started-up, it is highly unlikely the project could ever be a financial success. From an investor's perspective, the project is a disaster. Why don't more people with many years of project experience already know this? It could be because the training and education to build essential skills and knowledge has not been there, and for many Operators and Contractors, still doesn't exist - until now. This course answers the following crucially important questions: What is commissioning? What is systems completion? When and how should construction transition from areas to systems? How should I perform as a CSU team member or stakeholder? What does project success or project failure look like? What are the critical success factors for commissioning and start-up? This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

Course Overview and Phase 1 - Preparation

- Influence Curves and Planning
- Safety & Environmental Considerations
- Setting a Budget for CSU
- Gap Analysis
- The Commissioning Manager & Commissioning & Start-Up (CSU) Team
- Risk Assessments
- Systemization, Completions Pyramid, Start-Up Sequence, Turnover Process
- Introduction to Systemization, battery limits on P&IDs - Getting Stakeholder Agreement
- Introduction to System Priority Sequence for Initial Start-Up - Getting Stakeholder Agreement
- Dynamic Commissioning Procedures

Phase 2 - Implementation

- Progress Tracking & Reporting
- Factory Acceptance Testing and Preservations
- Tags, Checksheets, Certificates and Punch Listing
- Specialist Subcontractors for Cleaning, Drying, Leak Testing and Oil Flushing
- Completions Pyramid and Turnover Process

Phase 3 - Close out

- Pre-Start-Up Safety Review (PSSR) and Management of Change
- Handover to Operations
- Lessons Learned
- Planning for First Shutdown
- Critical Success Factors in Commissioning & Start-Up (CSU)

TARGET AUDIENCE:

This course is essential to Managers, Engineers, Technicians, Operators currently, or soon to be, involved in Systems Completion and Commissioning. This course is highly recommended to Managers, Engineers, Technicians, Operators stakeholder organizations, such as Construction, Operations, Engineering, QA/QC, Safety, supporting CSU on the project, you will gain valuable insight to your roles and other requirements imposed by this crucially important Discipline.

Advanced Project Management

SPECIALIZED: 5 DAYS FPM62

Mega projects are complex. A program composed of these super projects is highly complex. For a very large project, addressing linked issues is key to improving the chances of success. In a larger program, these key issues interact producing unexpected results. Instructors will explore critical issues in contracting, decision making, and facility design. Interface control and risk reduction are examined. Non-technical problems in stakeholder relations, partner ventures, and approvals, are also tackled. Upon completion, you will know how to: Deal with the program complexity and surprise effects Improve program strategies and deliver the projects on time Address both project and program resource concerns Instruction, guided discussion, and in-depth work tasks based on the instructor's petroleum experience are used. The work will include both single and group activities. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

Disclaimer
This course requires modifications for the Geothermal discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Advanced Project Management II

SPECIALIZED: 5 DAYS FPM63

This five-day, advanced level course for experienced project management professionals addresses the fundamental principles and techniques of project management and how to apply them on large international projects. This course will cover all the project phases, with hands-on content directly supported by practical case studies. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Advanced Project Management Workshop

SPECIALIZED: 3 DAYS APMW

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

COURSE CONTENT:

- Introduction and Workshop Overview
- Why Projects Fail: Track Record, Reasons for Failure, Warning Signs
- EPC Contracts - from bidding to execution
- Dispute Resolution and Claims
- EPC Risk Management
- Scope Changes
- Cost and Schedule Management
- Project Planning and Execution
- Working with Owner (Client) and their PMC
- Workshop Wrap up

TARGET AUDIENCE:

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

Construction Management for the Project Professional

SPECIALIZED: 3 DAYS FPM64

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

COURSE CONTENT:

- The role that construction management plays during FEED and detailed engineering to support success in the field
- Field project controls, earned value, buildup of field indirect charges, determination of 'all in' field labor costs, etc.
- Temporary construction facilities, construction infrastructure, field equipment, etc. and the role they play in construction success
- Key components of a construction execution plan and how project leaders and construction managers can use it to ensure engineering and procurement support the field effort
- Major components of a construction field procedures manual and how construction and project managers can use it to avoid rework and effectively organize the construction effort
- Advanced work packaging and how it effectively integrates material, engineering, field labor, scaffolding, and equipment to keep the project on schedule
- Methods to ensure field staff support the project leader to deliver a successful project (field superintendent, craft foreman, field engineering staff, and administrative staff)
- Contract types, contractor selection, and effective contractor management
- Managing the construction claim process
- The importance of a structured, field construction communications plan to ensure project controls, engineering, and procurement support field construction
- Utilizing an effective field construction contractor selection process including review of RFQ's, contractor interviews, etc.
- How to effectively conduct a constructability review with the owner and contractor

TARGET AUDIENCE:

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

Petroleum Project Changes and Claims Workshop

SPECIALIZED: 3 DAYS PPCC

This course will cover all key aspects of project changes and claims encountered throughout a project lifecycle. The focus will be on how to manage and control changes, take steps to prevent disputes and claims, and how to prepare claims. Different contract types will also be covered along with the required terms and conditions for project changes, disputes and claims. This course will not follow the traditional lecture-style format, instead it will be an interactive hands-on workshop where after a brief slide presentation for each agenda topic the participants will work on several real-life case study scenarios directly related to the selected topics. The workshop will cover both onshore and offshore projects. This course counts toward PMI Project Development Units (PDUs) through continuing education. Completion Certificates may be submitted to PMI as required to document third-party training.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Basic Reservoir Engineering

BASIC: 5 DAYS BR

Basic Reservoir Engineering is designed to help participants develop a comprehensive understanding of oil and gas reservoirs, covering fluid and rock characteristics, reservoir definition, delineation, classification, development, and production. The course emphasizes data collection, integration, and application to maximize recovery and Net Present Value. Basic reservoir engineering equations are introduced, with a focus on parameter significance and understanding the results. For nearly 30 years, this has been one of our most popular and successful courses.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Applied Reservoir Engineering

FOUNDATION: 10 DAYS RE

This course represents the core of our reservoir engineering program and the foundation for all future studies in this subject. Numerous engineering practices are covered, ranging from fluid and rock properties to simulation and field development planning. Proficiency in using Microsoft Excel to perform calculations and make graphs is desirable. Reservoir engineering is also presented in the context of a modern, multi-disciplinary team effort using supporting computer technology. An extensive set of reference materials is included. This course covers conventional reservoirs.

COURSE CONTENT:

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

TARGET AUDIENCE:

Engineers or geoscientists who will occupy the position of reservoir engineer, and any other technically trained individual who desires a more in-depth foundation in reservoir engineering.

Enhanced Oil Recovery Fundamentals

FOUNDATION: 5 DAYS ORE

One-third to one-half of the original oil-in-place may remain in a reservoir as it reaches abandonment due to its economic limit. The primary reasons are: heterogeneity of the reservoir, unfavorable fluid properties, inefficient nature of the displacement process, oil price, and production cost considerations. The secondary reasons, however, are: inappropriate development, inefficient reservoir management practices, and escalating costs of remedial interventions/corrective measures and producing operations. The oil recovery is generally lower than expected due to some combination of the above reasons. Gaining a better understanding of the reservoir fundamentals and the important variables that influence the recovery process can enhance it. This course aims to provide such an understanding. It presents the subject material with a clear focus on: developing and producing the reservoir efficiently within its complexity constraints, harnessing energies available within the reservoir-aquifer-injection system, realizing technical benefits and application limitations of the various EOR methods, and selecting the optimum time window. This course covers the recovery improvement possibilities that present themselves at all stages in the reservoir life cycle. It thereby enables one to timely select the most beneficial method and set realistic expectations on production behavior changes and recovery improvement. The impacts of the selected method on personnel training, technology transfer, and facility modification are also covered. The material is presented in simple terms that would enable a participant to understand what works where, what fails when, and why. It is light on theoretical equations, but it scrutinizes these to comprehend importance of significant parameters. It utilizes case studies from projects around the world; their analyses and interpretations aid the participant in understanding of the material. Many illustrative problems, worked in the class by teams, are helpful in gaining a better grasp of the subject matter. This course covers conventional reservoirs. “Como son tantos temas es prefeable realizar el curso en dos semanas.” - Reservoir Engineer, Colombia “The course will be very useful in my current role. Historical examples and technology evolution was interesting and helped me to understand the range, area, type of applications. Calculations very useful.” - Team Lead, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

Engineers responsible for sustaining or increasing oil and gas production and enhancing oil recovery from reservoirs under primary depletion, pressure maintenance by water or gas injection, and enhanced oil recovery schemes. Also, other professionals and managers participating in the above effort on a multi-disciplinary team who need to gain better understanding of the concepts, practices, benefits, and limitations of the various conventional and emerging technologies.

Reservoir Fluid Properties: Preparation for Reservoir Engineering and Simulation Studies

FOUNDATION: 5 DAYS RFP

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

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the “Request In-House Training” button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Waterflooding A to Z

FOUNDATION: 5 DAYS WF

Waterflooding has long been proven as the simplest and lowest-cost approach to maintaining production and increasing oil recovery from an oil reservoir. However, these benefits may fall short of expectations unless time-tested concepts and practices are clearly understood and judiciously implemented. These concepts and practices aim at process optimization—reducing production costs while minimizing waste and maximizing oil recovery and income.

This course is light on theory but heavy on proven and successful practices. Published case histories of projects around the world are reviewed to provide an understanding of different perspectives, what works where, what fails when, and why. The training covers all elements of a waterflood project from A to Z, including source water selection, produced water disposal, and everything in between. Participants are grouped into small multidisciplinary teams, and all classroom discussions and problem-solving sessions are handled in an asset management team format. Simulation studies are conducted in class to evaluate basic waterflooding physics and optimize the development of a hypothetical field.

The course covers conventional reservoirs.

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

- Overview & terminology
- Effect of rock properties
- Effect of heterogeneity and anisotropy
- Effect of fluid properties
- Wettability
- Capillary pressure
- Relative permeability
- Physics of water displacing oil
- Statistical forecasting
- Analytical forecasting
- Numerical forecasting
- Injector monitoring
- Producer monitoring
- Integrated monitoring
- Effect of water impurities
- Surface processing of injection and produced water
- Water shut-off
- Pattern rotation
- Natural & hydraulic fractures
- Horizontal well applications
- Downhole separation
- Enhanced waterfloods
- Waterflood planning
- Many case histories

TARGET AUDIENCE:

Reservoir, production, facilities, and operations engineers who are involved with some aspects of a new or existing waterflood project; geoscientists and professionals who want to get a better feel for the entire process of planning, developing, managing, and recovery optimization of a waterflood project.

Well Test Design and Analysis

FOUNDATION: 5 DAYS WTA

This course stresses practical application of well test theory to design and interpret pressure transient tests. An integrated approach to well test interpretation is emphasized throughout the course. Class exercises involving hand calculations and simple spreadsheet applications will reinforce the concepts illustrated by both synthetic data sets and real field examples. Participants will be able to apply the knowledge and skills they gain in this course to their job assignments upon course completion. One personal computer is provided, at additional cost, for each two participants. This course covers material for both conventional and unconventional reservoirs. "It's an amazing course. The concepts, practicality, and field implementation are a perfect blend of WTA." - Senior Reservoir Engineer, Malaysia "The number of exercises between lessons strengthened my understanding on the subject." - Operation Petrophysicist, Malaysia

COURSE CONTENT:

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

TARGET AUDIENCE:

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

History Matching and Reservoir Optimization

INTERMEDIATE: 5 DAYS HMRO

This course is designed to cover state-of-the-art techniques/workflows for history matching geologic and reservoir models for both conventional and unconventional reservoirs. The course will discuss manual and assisted history matching methods and also, inverse modeling techniques and the pros and cons of the methods. The production/history data can be in the form of pressure or rate transient tests, tracer tests, multiphase production history, or interpreted 4D seismic information. Field examples will be presented to illustrate the current state of the art and limitations. The use of history matched models for optimizing reservoir development and management strategies will be discussed. These include: optimal infill well-placement, rate optimization/well allocation for maximizing sweep efficiency, and optimizing well completions in unconventional reservoirs. The course will involve a combination of theoretical discussion, practical applications, and computer exercises using public domain software to provide the participants with hands-on training on the workflows that can be applied using available commercial software. This course covers both conventional and unconventional reservoirs. "Really enjoyed being exposed to streamlines and how much can be accomplished using them." - Rerservoir Engineer, Ghana

COURSE CONTENT:

- History Matching: fundamentals and workflow
- History matching - overview and state of the art
- History Matching - workflows
- Review of reservoir simulation equations
- Reservoir Simulation: background
- History Matching: mathematical background
- History Matching: unconventional reservoirs
- Unconventional Reservoirs: background and performance analysis
- Drainage volume calculations and completion optimization
- History matching of unconventional reservoirs
- History Matching: practical considerations
- Streamline-based history matching
- Streamline Simulation: overview
- Streamlines: mathematical background
- Streamlines: applications
- Streamline-based history matching
- History matching and uncertainty analysis
- Experimental design and surrogate models
- Multiscale history matching with grid coarsening
- Case Study: history matching and rate optimization
- Case Study: history matching and well placement optimization
- History Matching: new developments

TARGET AUDIENCE:

Practicing geoscientists and engineers performing geologic modeling, reservoir simulation, and optimization studies. Participants are expected to have basic knowledge and/or experience related to geologic modeling and reservoir simulation.

Integrated Reservoir Modeling

INTERMEDIATE: 5 DAYS GRD

As the oil companies define business units and asset teams, it is becoming increasingly important that all the team members understand the workflow in developing integrated reservoir description for that asset. A proper development of reservoir description is helpful in managing daily operations of the asset, as well as long-term planning. Integration involves using all the available information about the reservoir to develop better understanding of the reservoir. This process is inherently interdisciplinary and requires understanding of all the disciplines. Although soft skills are important in working in an interdisciplinary team, this course concentrates on the hard skills required to develop a realistic reservoir description. Starting with collecting information and assessing the need for additional data, the course will cover all the topics from structural and geological modeling, estimation of reservoir petrophysical properties using geostatistical tools, upscaling to simulator model and finally, proper history matching and future predictions in the presence of uncertainties. This course is important to reservoir modelers involved in any phase of the description work. This is intended to expose various geoscientists and engineers to the entire process of integrated reservoir description and the geostatistical tools that can be used to achieve the goals. The course will develop improved appreciation of the other disciplines' needs as well as the necessity of the feedback during the integration process. The instructor of this course is willing to accept examples from your company for analysis in the class as one of the demonstration exercises. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time. This course covers both conventional and unconventional reservoirs. "The course was very well taught. I though the explanations were clear and the reviews helpful to retain what I've learned." - Team Lead - Engineering, Canada "The professor gave theories together with practical examples using commercial software. I got basic understanding of static and dynamic modeling. I feel very satisfied." - Petroleum Geologist, South Korea

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Oil and Gas Reserves Evaluation

INTERMEDIATE: 5 DAYS OGR

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

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Reservoir Characterization: A Multi-Disciplinary Team Approach

INTERMEDIATE: 5 DAYS RC

The modern team approach to Reservoir Characterization describes productive zones more reliably through the integration of disciplines, technology, and data. Increase your proven reserves, discover by-passed pay, reduce development time and costs, improve production rates, and rejuvenate old fields through the skills learned in this course. The course is process-based and focuses upon: Understanding the applicability of measurements and interpretations from the participant's discipline to other adjacent disciplines Understanding information from other disciplines, and the uncertainties and risks involved in its gathering/interpretation Awareness of the latest technologies and working principles evolving on the cutting edge of the industry Managing a complex project to solve business problems in the most efficient manner, particularly when working in a difficult environment (multi-disciplinary teams, sponsors and bosses outside your expertise, cross purposes from disciplines) Working with both probabilistic and deterministic multiple working hypotheses throughout a hydrocarbon project During the course, particular attention will be paid to uncertainties and risks. It will be shown how these can be handled and their impact on the economics of hydrocarbon projects. The instructor is willing to accept examples from your company for analysis in the class as one of the demonstration exercises. It is also possible to design a course specifically for your own company around such a case study. Please contact PetroSkills for a list of the information and support data required, as well as the necessary lead-time. This course covers conventional reservoirs. "I absolutely enjoyed the project, especially when all team members became involved and contributed." - Reservoir Engineer, Ghana "The application of learnt knowledge at the end of each topic was well organized." - Petroleum Engineer, Barbados

COURSE CONTENT:

- Business value drivers and selection criteria
- The scale and resolution of data
- Variograms, correlation length
- Time, rock, and flow units
- Seismic attributes
- Upscaling, streamline simulation
- Decision trees; value of information
- Giving and receiving feedback
- The future of Reservoir Characterization

TARGET AUDIENCE:

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

Reservoir Management

INTERMEDIATE: 5 DAYS RM

The principles of sound reservoir management are presented with emphasis on practical applications. Actual case histories are used to study both successes and failures. An interdisciplinary synergistic approach to efficient reservoir management is detailed with the goal of optimized profitability. The significance of each component and the importance of timing and cost/benefit analysis are emphasized. Reservoir management models for optimum field development and field operating plans are analyzed. The interdisciplinary reservoir management approach shows how each technology or function contributes to the plan and how checks and balances are developed. This course covers conventional reservoirs. "I thoroughly enjoyed the entire course." - Exploitation Engineer, Canada "Liked integration of all data for reservoir management." - Ag. Principal Geologist/ Reservoir, Uganda

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Reservoir Management for Unconventional Reservoirs

INTERMEDIATE: 5 DAYS RMUR

This course in unconventional reservoir management is aimed at all petro-technical professionals who have little experience with these resource types but who wish to quickly learn some key elements and issues associated with the exploitation of unconventional reservoirs (tight gas, tight oil, and shales). The course is built around the role of the reservoir engineer and, hence, concerns itself with the integration and use of information to make well rate and recoverable volumes estimates, making decisions on desirable data collection, and planning answers to common questions such as choice of initial development spacing and the value of subsequent infill drilling. Attendees should leave this course with an improved understanding of unconventional reservoir exploitation. "Instruction on multi-frac horizontals is directly applicable to my current work." - Reservoir Engineer, Houston, United States "I loved the derivations and background information for the reservoir programs we use. Instructor was very knowledgeable of tight gas and shale gas and the development of these assets in basins all around the world." - Reservoir Engineer, Oklahoma City, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types. The course is focused on reservoir management issues for tight gas, tight oil and shale reservoirs. CBM reservoirs are not addressed.

Reservoir Simulation Strategies

INTERMEDIATE: 5 DAYS RSS

This course is designed to give an introduction to the fundamental and practical aspects of modern reservoir simulation. Particular emphasis is placed upon the available data and its integration into a data set that reflects a coherent model of the reservoir. These aspects are reinforced with small practical examples run by groups of the course participants. The course is organized in morning lecture sessions and afternoon practical sessions. This course covers conventional reservoirs. "Practical exercises. Liked understanding the theory and the problems/limitations that can arise." - Reservoir Engineer, United Kingdom "All subjects were very important. The way that was concatenated the theory with real field examples." - Reservoir Engineering Advisor, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Chemical Enhanced Oil Recovery Fundamentals

SPECIALIZED: 5 DAYS EORC

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Coalbed Methane Reservoirs: Advanced Analysis Techniques

SPECIALIZED: 4 DAYS CMR

This four-day advanced coalbed methane (CBM) / coal seam gas (CSG) course is designed to present attendees with the most current analysis techniques developed by industry for application to CBM reservoirs. The class will cover a full range of integrated topics ranging from characterization of the coals through data collection and testing, drilling and completion, reservoir engineering, pilot design and production management strategies. CBM Resource and Reserve guidelines are developed so that the attendee can best design field development plans. A set of course notes is provided, including problems and solutions developed from actual CBM data sets. This course is designed for technical and managerial staff who desire a comprehensive understanding of the state of the art analysis techniques currently being used to assess and evaluate CBM reservoirs worldwide.

COURSE CONTENT:

- Coal geology
- Core analysis and lab experiments
- Gas content and saturation of coals
- Critical desorption pressure testing
- Coal permeability
- Designing a data collection program
- Drilling and completion strategies
- Production performance
- Analytical analyses
- CBM reservoir simulation
- Pilot performance
- CBM reserves and resources
- Production management

TARGET AUDIENCE:

Technical and managerial staff who need an understanding of coalbed methane / coal seam gas (CBM/CSG) testing, appraisal and production methodologies.

Decline Curve Analysis and Diagnostic Methods for Performance Forecasting

SPECIALIZED: 2 DAYS DCA

Decline curve analysis has been called the most commonly used and misused technique for forecasting future production and remaining reserves. This course will give the learner a better understanding of how fundamental reservoir properties and drive mechanisms affect the shape of the production decline curve and how to avoid many of the mistakes commonly found in decline curve forecasts. The course also examines the use of modern production decline type-curves to evaluate reservoir properties and predict future performance. One personal computer is provided, at additional cost, for each two participants. This course covers both conventional and unconventional reservoirs.

Disclaimer
This course requires modifications for the Carbon Capture, and Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

Engineers or technical assistants who are responsible for making forecasts of future production using decline curves analysis. Economists, managers, or geoscientists who are interested in developing a greater working knowledge of decline curve methods and how to make better forecasts will also benefit from this course.

Enhanced Oil Recovery with Gas Injection

SPECIALIZED: 5 DAYS EORG

On average nearly two-thirds of the original oil in place remains after reservoir abandonment following secondary recovery. The low oil recovery is primarily the result of reservoir heterogeneity, unfavorable fluid and rock properties, poor waterflood management, and cost considerations. This leaves a significant target for enhanced oil methods. Recent focus by many governments to sequester CO2 also provides incentive to initiate new gas floods. One of the most accepted robust, and widely used technologies for enhanced oil recovery (EOR) is gas flooding. Gas flooding is the injection of hydrocarbon or nonhydrocarbon components into oil reservoirs that have typically been waterflooded to residual oil. Injected components are usually gases at atmospheric temperature and pressure and may include mixtures of hydrocarbons from methane to propane, and also carbon dioxide, nitrogen, and even hydrogen sulfide. The key to successful gas flooding is to contact as much of the reservoir with the gas as possible and to recover all of the oil once contacted. Injected gases must be designed to be miscible with the oil so that oil previously trapped by capillary forces is transferred into a more mobile phase that flows easily to the production well. Unfortunately, miscibility is not always possible and reservoir heterogeneities can cause gas to cycle through one or more layers, which results in poor sweep and overall recovery efficiency. This course gives a comprehensive understanding of immiscible gas and compositionally enhanced recovery processes and the important variables that influence the gas flooding process. The course contains both theoretical and practical material so that an engineer can apply learned knowledge to his/her unique reservoir. The course discusses process optimization to reduce production costs while maximizing oil recovery and income. Compositional simulation using equations-of-state are used to demonstrate how to optimize gas design parameters for water-alternating-gas floods. Published case histories from around the world are reviewed to provide an understanding of what works where, what fails, and why. The course is supplemented with the SPE Fundamentals of Enhanced Oil Recovery textbook and the monograph on Practical Aspects of CO2 Flooding. One personal computer is provided, at additional cost, for each two participants. "One of the best courses I ever attended." - Geologist, Bahrain "I liked that we learned the basics of gas flooding at a high level and it got more complicated, and then we applied our knowledge using case studies and performed a simulation." - Verification Coordinator, United Kingdom

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Gas Reservoir Management

SPECIALIZED: 5 DAYS GRM

Natural gas production has become a major part of every petroleum company's asset base and continues to grow in importance throughout the world. This course will help participants understand the engineering drivers on gas reservoir management and how a gas reservoir's value can be maximized through sound engineering practices. A full spectrum of gas reservoir engineering techniques is addressed and their application to a large variety of gas resource management options is discussed. This course covers conventional reservoirs. "Teacher was very good. Has a lot of practical experience and interesting stories." - Reservoir Engineer, Germany "Liked the presentation and the flow of the examples - hands on exercises." - Reservoir Engineer, United Kingdom

COURSE CONTENT:

- Gas reservoir fluid properties: gas condensate sampling and understanding laboratory reports
- Gas reservoir fluid flow and well testing: deliverability testing and non-darcy flow, testing for hydraulically fractured wells, horizontal wells, and gas condensate reservoirs
- Determination of original gas-in-place: material balance techniques for various drive mechanisms and reservoir types, alternate plotting techniques, production decline type curves
- Gas flow in wellbores and pipelines: the gas production system, pressure drop in wellbores and flowlines, restrictions to gas production
- Prediction of future performance and ultimate recovery: decline curves, coupled material balance and deliverability techniques, reservoir simulation, gas well spacing and infill drilling
- Special topics
- Reservoir management of water-drive gas reservoirs, predicting gas condensate reservoir performance, coalbed methane reservoirs

TARGET AUDIENCE:

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

Horizontal and Multilateral Wells: Analysis and Design

SPECIALIZED: 5 DAYS HML1

This course covers both conventional and unconventional reservoirs. This course is designed to better advance well concepts including horizontal and multilateral wells as they have become a dominant feature of new field development and redevelopment opportunities. They can, when used appropriately, dramatically improve the economic profitability of field development operations, for both unconventional and conventional resources. The complex, interdisciplinary decisions in advanced well projects are emphasized in this course. The application and benefits of horizontal and multilateral wells are analyzed. The process of candidate screening and selection, involving geological, reservoir, and production characteristics are considered, as well as constraints on drilling and completion options. Methods to predict well performance and recovery from horizontal and multilateral wells are presented with integration of inflow and wellbore flow performance for individual and multilateral wells. Well completion options and its impact on well performance for horizontal and multilateral wells are summarized. The improvement by well stimulation (multistage hydraulic fracturing and matrix acidizing) is evaluated. Economic and risk analysis are also presented with a number of case histories to highlight the performance and benefits of horizontal wells and the elements of risk and uncertainty at the initial design stage. The instructor will use the examples from participants' field cases for analysis in the class as demonstration exercises. Field problems will be analyzed and suggestions will be provided through the course.

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Naturally Fractured Reservoirs: Geologic and Engineering Analysis

SPECIALIZED: 5 DAYS FR

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

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

New Opportunities in Old Fields

SPECIALIZED: 5 DAYS NOF

Don't buy or sell a producing property before taking this course! There is nearly always upside in mature oil and gas fields that may be particularly profitable because of existing wells and infrastructure. The keys to successful exploitation of new opportunities include: Recognition of the new opportunities Quantification of the reserves Evaluation of alternative methods of exploitation Economic analysis of depletion scenarios Case studies and class problems address each of these key items and illustrate how new opportunities can be recognized and evaluated for many different types of oil and gas reservoirs. The computer-based problems will provide the delegate with utility programs and solution templates that can be used in the real world. Appendix Topics: additional information for student reference or class review as appropriate, including decline curve analysis, rock and fluid properties, material balance, fluid displacement and coning, and reservoir simulation. This course covers conventional reservoirs.

Disclaimer
This course requires modifications for the Carbon Sequestration discipline. Visit the website and click the "Request In-House Training" button for more details

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Streamlines: Applications to Reservoir Simulation, Characterization and Management

SPECIALIZED: 5 DAYS SRS

The use of streamline technology is becoming common for reservoir flow visualization, dynamic reservoir characterization, and optimal flood management. The power of the streamlines can be exploited using both finite-difference and streamline simulators. This course is designed to cover introductory and advanced concepts in streamline technology and its applications for reservoir characterization, reservoir management/optimization and field development strategy. This course is not limited to streamline simulation but exposes the power of streamlines in general. The course will involve a combination of theoretical discussion, practical applications, and computer exercises to provide hands-on training on the methods that can later be applied using any commercial streamline simulation software. A copy of the SPE textbook Streamline Simulation: Theory and Practice by Akhil Datta-Gupta and Michael J. King along with streamline simulation software will be provided to each course participant. This course covers conventional reservoirs.

COURSE CONTENT:

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

TARGET AUDIENCE:

Practicing geoscientists and engineers. No formal training in reservoir simulation is required other than knowledge of basic mathematics.

Unconventional Resource and Reserve Evaluation

SPECIALIZED: 5 DAYS URRE

This five-day advanced course is designed to expose attendees to the understanding and application of the latest approaches, techniques and requirements being applied to reserves evaluation within unconventional resources. Particular focus is given to actions and methodologies that are necessary to enhance the reserve categorization. Discussion and class examples will emphasize the testing protocols necessary within the exploration, appraisal and at development phases of the resource life cycle. The course is based around the Petroleum Reserve Management System (PRMS) and variations needed to conform to other national standards such as the SEC, NI-51, SORP, NPD, Chinese, as well as other standards is taught as a stand-alone module. A majority of the offering is focused on shale oil and shale gas resources, with selected coverage of tight gas, coalbed methane and coal seam gas plays also being included depending on participant interest.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Basic Drilling Technology

BASIC: 5 DAYS BDT

This course offers a fundamental overview of the design, planning, and implementation of drilling oil and gas wells. It benefits all parties involved in the drilling process, including administrative support and multi-discipline team members, by enhancing their understanding of basic concepts and practices. The course covers essential terminology, equipment, and procedures, with detailed discussions on drill bits, directional drilling, drilling fluids, solids control, cementing, casing, well bore stability, well control, measurement-while-drilling techniques, stuck pipe, lost circulation, and well bore hydraulics. Additionally, it includes topics like clay mineralogy, pressure effects, and the behavior of rocks under pressure to improve understanding of drilling operations for participants of all backgrounds.

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Casing and Cementing

BASIC: 5 DAYS CAC

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

COURSE CONTENT:

- Selecting casing and hole sizes
- Setting depths
- Casing loads
- Selecting casing and connections
- Casing stress calculations
- Cement and cement additives
- Selecting appropriate slurries
- Mud removal and cement placement
- Stage cementing, squeezes, and plugs
- Preventing gas migration
- Cementing calculations
- Cementing equipment
- Well head equipment

TARGET AUDIENCE:

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

Drilling Fluids Technology

FOUNDATION: 5 DAYS DFT

This course is designed for engineers and field personnel involved in the planning and implementation of drilling programs. The seminar covers all aspects of drilling fluids technology, emphasizing both theory and practical application. Hands-on laboratory exercises are included in the five-day Houston sessions. Drilling is a complex operation requiring the marriage of different technologies and disciplines. Today's drilling personnel must have a working knowledge of the drilling fluid in order to effectively drill a well. The course provides the fundamentals necessary to drill a well, whether it is a shallow well or a complex, high pressure well. "Very clear! Excellent" - Participant, United States "I liked the hands on lab portion of the class the best." - Facilities Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

Drilling supervisors, drilling engineers, tool pushers, managers, and technical support personnel involved with drilling operations. This course is valuable for anyone who needs to understand the fundamental aspects of drilling fluids.

Drilling Practices

FOUNDATION: 10 DAYS DP

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Fundamentals of Casing Design

FOUNDATION: 5 DAYS FCD

Casing design is an integral part of a drilling engineer's work scope. This course provides a comprehensive overview of the design process, emphasizing the working stress approach currently used in the industry. On completion of this course, successful participants will be able to select casing points, identify tubular requirements and loads, and design and specify the required casing string. Through a combination of lecture and extensive hands-on examples, the fundamentals of casing design are imparted to the attendees. Estimation of standard and special loads is covered in detail. Standard theories of strength and failure are discussed as well as advanced considerations for combined loads. In addition safe handling, running and hanging practices are covered. Participants will be furnished Dr. Byrom's textbook, 'Casing and Liners for Drilling and Completion,' and computer spreadsheets to facilitate routine design calculations. "I appreciated very much the teacher's experience, professionalism, and knowledge in the subject matter." - RTOC Specialist, Canada "Biaxial and triaxial load concepts were described and exercised just brilliantly." - Drilling Engineer, Azerbaijan "Class examples were excellent. Brought concepts together well." - Drilling Engineer, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Primary Cementing - Cementing I

FOUNDATION: 4 DAYS PCE

Cementing is a key factor in the well construction plan. The base cement used in the designing of cement slurries may or may not be API class cement. The operating company and the service company personnel should have a good working knowledge of cement slurry design, cement additives, and placement procedures. The majority of the operating companies do not have cement testing laboratories; therefore, the laboratory testing is conducted by service companies. This course is designed to give a good understanding of how the cement slurries are tested and under what conditions depending on given well parameters. This course will also cover casing hardware (both internal and external), cement blending, cement additive blending (dry and/or liquid), on-site mixing equipment and job execution on location. "World class expert, glad I was able to learn from him. Lab tour gave a better understanding of practical tests." - Participant, United States "Loved conversations on lost circ and solutions to same. Very interested in evaluations of cement. Really enjoyed the lab." - Geologist, Canada

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Stuck Pipe Prevention - Train Wreck Avoidance

FOUNDATION: 3 DAYS SPP

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Well Design and Engineering

FOUNDATION: 10 DAYS WDE

Well Design and Engineering integrates all major well design technologies from pre-spud to TD. Participants are actively engaged in every aspect of the technical activities required to deliver a cost-effective well plan while also gaining valuable perspective on how the overall process should be managed in a dynamic team environment. The workshop content is often customized to address technologies and practices that may be specific to a project or operational situation. The course delivery is carefully balanced to integrate technical lectures and group discussion with roughly half of each day allotted for the teams to apply what they have learned on the project well design. The single most important goal of the workshop is to draw the linkages between the design topics and to leave the participants with an understanding that each decision has influence on those that follow. Intensity mounts as the course progresses and each design topic builds on those that came before. Design iterations are commonly required, especially as the course progresses and seemingly unrelated decisions push the teams into situations of uncomfortable operational risk. On the last day, each team presents their completed design before the class and an invited panel of industry professionals. "Great overview and outline of everything to design a well." - Petroleum Engineer, United States

COURSE CONTENT:

- Trajectory design
- Wellbore stability and casing point selection
- Drilling fluids and solids control
- Casing design
- Primary cementing
- Drill string and BHA design
- Bit technology
- Circulating system hydraulics and hole cleaning

TARGET AUDIENCE:

Drilling engineers, completion engineers, and drilling supervisors involved with drilling operations and well planning.

Well Site Supervisor Development Program

FOUNDATION TRACK 1
APPROXIMATELY 400 TOTAL HOURS OF PROGRAM WORK OVER A PERIOD OF 14 MONTHS (RECOMMENDED TO PROVIDE RIG TIME BETWEEN UNITS)

This structured 14-month program combines:

- eLearning courses
- Virtual instructor-led training sessions
- Post-assessments & Back-to-Work plans

This program is designed to develop your employees into the functional role of a Well Site Supervisor. By combining self-paced online activities with live virtual instruction and practical workshop application, this program equips your employees to be revenue generating team leaders at the well site. Using PetroSkills' PetroAcademy application and/or delivered real-time virtual sessions via WebEx, this program gives you the confidence that your employees are being developed using proven industry-validated competencies for this critical role.

COURSE CONTENT:

- Well Construction Foundations
- Descriptive Formation Fundamentals
- Onsite Fluids Management
- Casing and Cementing Operations
- Directional/Horizontal Drilling Operations
- Drilling Optimization Operations
- Initial Completions and Well Testing
- Interventions Operations
- Managing Wellsite Operations
- Crew Resource Management
- The Reduction of Unplanned Events
- Basic Petroleum Economics
- Project Management for Upstream Field Development
- Comprehensive Review, Capstone Exercise and Testing

TARGET AUDIENCE:

Field supervisors and junior field supervisors who are being developed to be well site supervisors Entry-level well site field personnel Experienced personnel who are cross-training to move into a supervisory role leading operations at the well site

Cementing Practices - Cementing II

INTERMEDIATE: 5 DAYS CEP

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Deepwater Well Engineering

INTERMEDIATE: 5 DAYS DWE

This is a five-day course designed to promote understanding of well design and engineering capabilities unique to the deep water environment. Participants are actively engaged in the skills and activities required to deliver a cost-effective well plan, while also gaining valuable perspective on the role of a DW drilling engineer as a project manager. Suggested course prerequisites include 3+ years' experience in drilling and 2+ years in a well planning role for onshore or shallow water applications. "Overall a very good course. Instructor was very insightful." - Vice President Engineering, United States "I really enjoy the teaching approach. Also I really enjoyed the practical teamwork." - Well Operations Engineer, Canada

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Directional, Horizontal, and Multilateral Drilling

INTERMEDIATE: 5 DAYS DHD

This course builds a firm foundation in the principles and practices of directional drilling, calculations, and planning for directional and horizontal wells. Specific problems associated with directional/horizontal drilling such as torque, drag, hole cleaning, logging, and drill string component design are included. Participants will receive instruction on planning and evaluating horizontal wells based on the objectives of the horizontal well. The basic applications and techniques for multi-lateral wells are covered in the course. Additionally, they will become familiar with the tools and techniques used in directional drilling such as survey instruments, bottomhole assemblies, motors, steerable motors, and steerable rotary systems. Participants will be able to predict wellbore path based on historical data and determine the requirements to hit the target. "Very interesting and filled in gaps." - Drilling Engineer, United States "The trainer is industry professional with a great experience to share with participants. The course covers not only regional practices but worldwide used." - Challenger Drilling Engineer, United Kingdom

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Drill String Design and Optimization

INTERMEDIATE: 5 DAYS DSD

We have been presenting Drill String Design workshops for over 12 years for all types of operations around the world. We are constantly updating our materials to reflect the latest technology applications for both near-vertical and high-angle well designs while maintaining a thorough grounding in the fundamentals. Workshop content is often customized to address customer-specific operational situations and software applications. Course tuition includes a copy of DS-1 Drill String Design Standard 4th Ed. Vol.2. "Well organized." - Drilling Engineer, South Korea "The instructor explained material very well and thouroughly." - Technical Advisor Associate, United States

COURSE CONTENT:

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

TARGET AUDIENCE:

Operator, drilling contractor, and service company engineers; drilling supervisors and superintendents. This is an intensive technical workshop.

Managing Wellsite Operations

INTERMEDIATE: 5 DAYS MWC

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

COURSE CONTENT:

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

TARGET AUDIENCE:

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

Well Planner Development Program

SPECIALIZED TRACK 2
RECOMMENDED PROGRAM DURATION OF 7 MONTHS, WITH THE ASSUMPTION THAT THE INDIVIDUAL WOULD SPEND 2 WEEKS IN OFFICE WORKING WITH AN EXPERIENCED ENGINEER.

This program is designed to assist you as you develop your employees into the functional role of a global well planner. By utilizing live virtual instruction session in a workshop format, attendees will be equipped to evaluate and apply the practical knowledge they receive in the Well Planner Development Program and apply the industry validated knowledge and skills with relevant on-the-job learning at the well site. This is an advanced level, hands on workshop and it is strongly recommended that attendees first complete the Well Site Supervisor Development Program to gain the critical fundamental level knowledge required in the Well Planner role. Recommended program duration of 7 months, with the assumption that the individual would spend 2 weeks in office working with an experienced engineer.

Pre-requisite: Well Site Supervisor Development Program and 3-5 years of field experience in the Well Site Supervisor role. Well Planner Development Program requires a minimum number of participants to go through the Workshops together virtually. Synchronous sessions required.

COURSE CONTENT:

- Drilling Basis of Design
- Fluid Design Workshop
- Casing Design Workshop for Well Planners
- Cementing Design Workshop for Well Planners
- Directional Drilling Design Workshop for Well Planners
- Drilling Excellence Design Workshop
- Completion Design Workshop for Completion Planners
- Intervention Design Workshop for Intervention Planners
- Crew Resource Management
- Business / Soft Skills Training
- Project Management

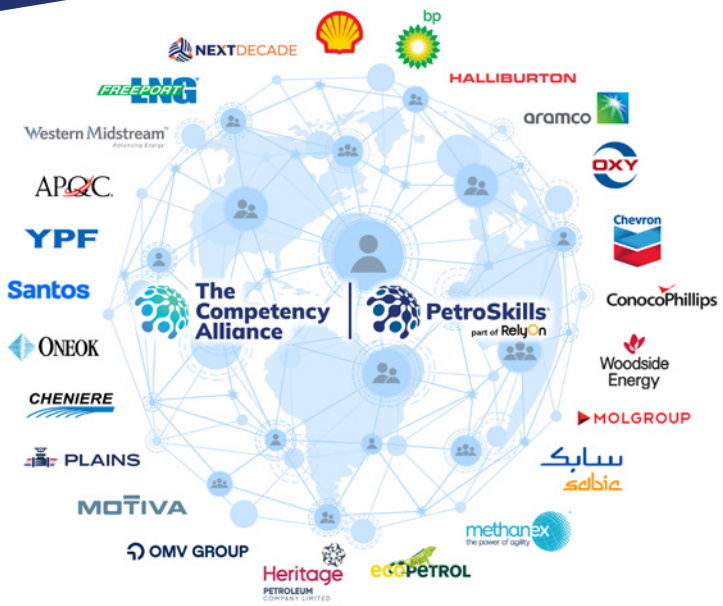
TARGET AUDIENCE:

This program is designed for individuals who have already completed the Well Site Supervisor Development Program as well as having a minimum of 3-5 years of practical experience in the field as a Well Site Supervisor.

The PetroSkills Alliance

Industry-driven, industry-approved competency-based training

The PetroSkills Alliance is focused on meeting the challenges of workforce development and a rapidly changing hydrocarbon resource base.



The PetroSkills Alliance was founded in 2001 by Shell, BP and OGCI, to provide "important but not unique" competency based training. Since then it has evolved into an industry-driven, industry-approved program that spans the industry. Today, with dozens of members representing all facets of the global oil and gas industry, the PetroSkills Alliance is focused on meeting the challenges of workforce development and a rapidly changing hydrocarbon resource base. As the oil and gas Industry's partner, our mission is to deliver consistent, high quality, learning and development training and programs to build competent petroleum professionals.

It Begins with People Focused on Development:

People

PetroSkills longevity and relevance is a direct result of the member company input. Subject matter experts contributed by Alliance member-companies ensure that our courses address current industry needs through our technical discipline networks.

Processes

PetroSkills training programs and courses are the products of PetroSkills' technical networks and quality processes. Together they ensure that the courses are relevant and aligned with today's needs for competency development and assurance.

Competency Solutions

Workforce development and tailored competency assurance solutions across teams, regional operations and the entire enterprise are available with our integrated consulting, and software solutions.

Accelerating Time to Autonomy

We deliver knowledge when, where and how it is needed. Our instructor-led training is available in person or virtually in real time, from a remote location. Blended coaching and mentoring accelerates time to competency.

To learn more visit petroskills.com