2024 TRAINING COURSE CATALOG

Training Excellence for the Energy Industry
Public, Private, & Live Online Formats

SCA
SUBSURFACE CONSULTANTS

Featured Training Programs:

- The Daniel J. Tearpock Geoscience Certification Program (**p 30**, **53**)
- Energy Transition Courses (**p 45**)

We practice what we teach.

SUBSURFACE CONSULTANTS & ASSOCIATES, LLC

Serving the Upstream Oil & Gas Industry Since 1988

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At SCA, our motto is:

"EXCELLENCE THAT RUNS DEEP"

We apply this commitment to all of our services including training, consulting, and recruitment. At all levels of our organization, we are led by years of applied industry experience.

Whether for hiring decisions or strategic investments, SCA's recommendations are grounded in professional ethics and supported by respected authorities and decision-makers.

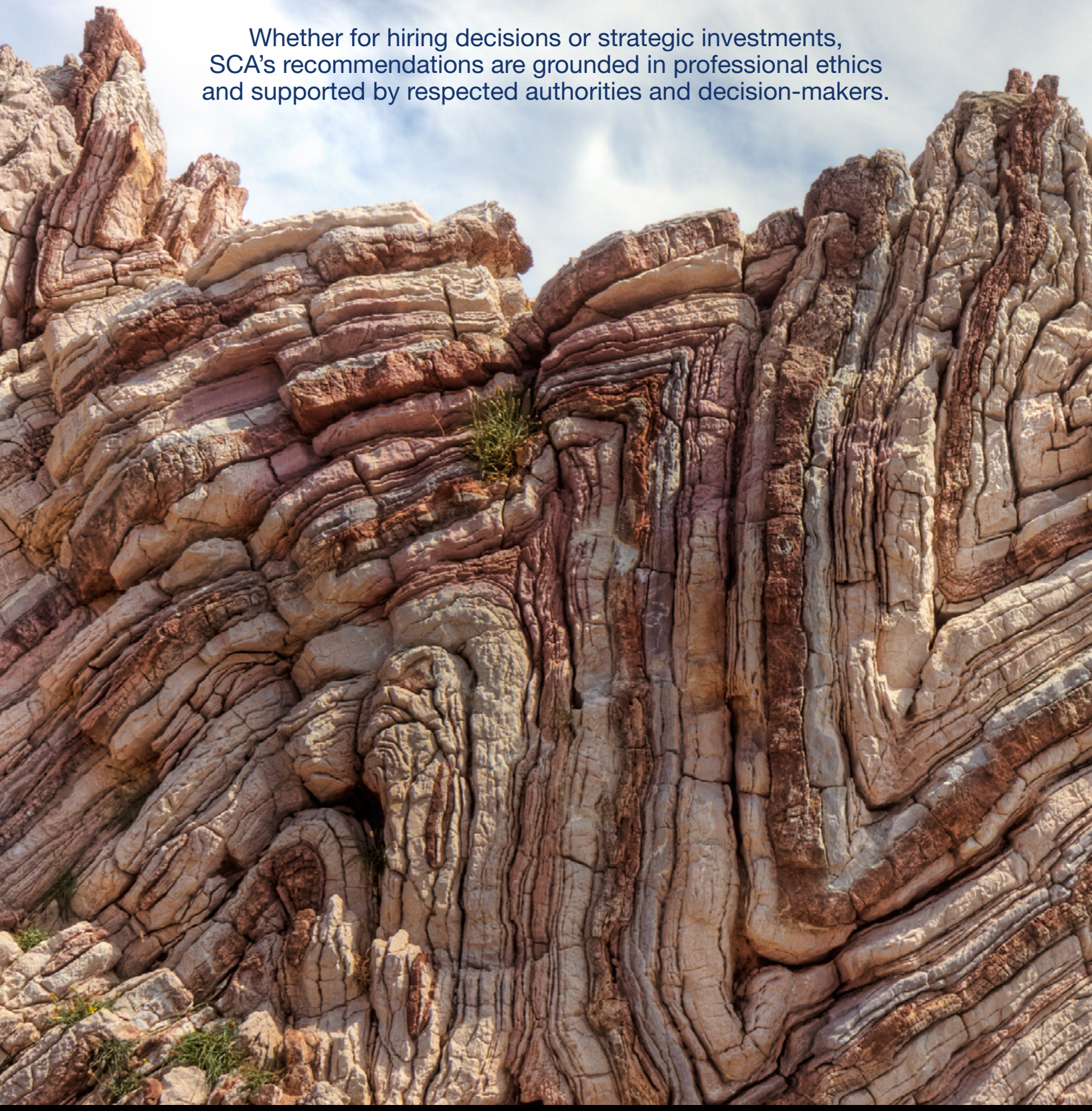


TABLE OF CONTENTS

Our Services 4

Live Online Courses 7

Complete Course Listing 8

SCA Publications..... 11

Terms & Conditions 12

Course Descriptions:

- Geoscience 14
- Engineering 32
- Unconventional Reservoirs 40
- Energy Transition..... 45
- Formation Evaluation 49
- Multi-Disciplinary & Introductory 53
- Field Courses 58

Principles of Mapping with Petrel© 28

The Daniel J. Tearpock Geoscience Certification Program..... 30

Business Advisory Services..... 44

Subsurface Alliance..... 48

IHRDC 57

Instructor Biographies..... 63

Tailored Tutorials 72

SCA HAS TRAINED OVER 27,000 GEOSCIENTISTS AND ENGINEERS WORLDWIDE.

Our training services include an extensive lineup of over 90 courses spanning Geoscience, Engineering, Unconventional Reservoirs, Energy Transition, Formation Evaluation, Multi-Disciplinary & Introductory, and Field Courses. Our flagship classes include:

- Applied Subsurface Geological Mapping (**p 27**)
- Quality Control Techniques for Reviewing Prospects & Acquisitions (**p 29**)
- The Daniel J. Tearpock Geoscience Certification Program (aka 'Geoscience Boot Camp') (**p 30**)

For over 35 years, SCA has been providing energy professionals across the experience spectrum with the highest quality continuing education and technical training in the industry. SCA instructors are industry leaders, trained in delivering engaging learning solutions. For more information, please contact us at training@scacompanies.com.

Cover: Reflection Canyon, Utah / Page 2: Folded Limestone on Crete, Greece

OUR SERVICES

SCA
SUBSURFACE CONSULTANTS

Subsurface Consultants & Associates, LLC

Founded by Daniel J. Tearpock in 1988, Subsurface Consultants & Associates, LLC (SCA) provides consulting, training, and recruitment services to the energy industry.

Consulting

We provide geoscience and petroleum engineering personnel to supplement our client's activities in the energy industry. Our consultants have conducted assignments in over 50 countries and in virtually every major producing basin around the world.

Categories of projects and studies that our consultants have worked include:

- A&D Advisory
- Appraisal and Field Development Evaluations
- Asset/Portfolio Evaluation
- Business Advisory Services
- Carbon Capture Utilization & Storage
- Geothermal Services
- Mentoring
- Post-Drilling Evaluation and Assessment
- Prospect Generation and Evaluation
- Reservoir & Geomechanics
- Third Party & Peer Review

Training

We provide technical training to energy industry professionals of all experience levels around the world. Our instructors are industry-recognized experts in their fields.

Both in-person and live online courses are offered in the following disciplines:

- Geoscience
- Engineering
- Unconventional Reservoirs
- Energy Transition
- Formation Evaluation
- Multi-Disciplinary & Introductory
- Field Courses

Recruitment

In addition to contract assignments, we also place candidates into full-time positions. Our recruiting team is committed to understanding each client's unique requirements and is proficient in assessing candidates to meet those specific needs.

Clients

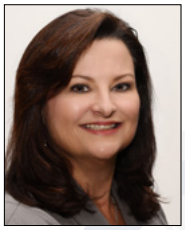
APA Corporation, bp, Chevron, ConocoPhillips, equinor, ExxonMobil, Hilcorp, KNOC, Marathon Oil, NPDC, OXY, PETRONAS, أرامكو السعودية saudi aramco, Shell ENERGY

MANAGEMENT TEAM

C. SUSAN HOWES, PE, PHR, PRESIDENT

C. Susan Howes is President at Subsurface Consultants & Associates LLC, and she served as SCA Vice President of Engineering from 2016 to 2022. Howes' prior experience includes roles of increasing responsibility at Anadarko and Chevron in reservoir engineering, business development, corporate engineering, HR, organizational capability and reservoir management. Howes chairs the SPE ATCE Program Committee and serves as past chair of the SPE Management Technical Section. She chairs the SWE Houston Area Awards Committee and serves on the Board of Directors for Girl Scouts - San Jacinto Council. Howes received the SPE DeGolyer Distinguished Service Medal, is an Honorary Member of SPE, and served as a SPE Distinguished Lecturer for 2019-20. Howes holds a BS degree in Petroleum Engineering from the University of Texas.

MARY ATCHISON, VICE PRESIDENT OF TRAINING



Mary Atchison became Vice President of Training Operations for SCA in September 2012. Prior to joining the company in 2009 as Training Services Business Development Manager, Mary spent over 10 years providing total turnkey training packages worldwide for the oil and gas industry. She is currently responsible for the overall management of SCA's training services department which provides upstream geoscience and engineering training to clients around the world. Mary received her BA in Marketing from Sam Houston State University.

MATT NOWAK, DIRECTOR OF BUSINESS DEVELOPMENT

Matt Nowak has been working in the oil and gas industry since 2000. He works directly with senior-level professionals at major international oil companies, as well as independent producers. He joined SCA in 2006 as a Business Development Manager and currently serves as one of the Directors of Business Development. In this role he is responsible for overseeing sales and recruiting efforts and promoting SCA's internal Projects & Studies teams. Matt received his Bachelor's Degree in Marketing from Texas A&M University.

TIM RIEPE, DIRECTOR OF BUSINESS DEVELOPMENT

Tim Riepe joined SCA in 2008 and currently serves as Director of Business Development. In this capacity he manages the recruiting and sales efforts around SCA's core competencies. He maintains professional relationships with a large network of geological and engineering Independent Consultants, and promotes SCA's Consulting services, internal Projects & Studies teams, Direct Hire services and the 95+ training courses SCA offers. Tim earned his Bachelor's Degree in Marketing from Texas Lutheran University.

MATT MILLER, ACCOUNTING MANAGER

Matt Miller joined SCA in 2012 as an Upstream Recruiter and is currently serving as Accounting Manager having transitioned into that role in 2015. In that capacity, he is responsible for managing SCA's accounting duties including but not limited to oversight of accounts receivable and accounts payable, employee payroll and independent contractor payments, and filing quarterly and annual state and federal documents. In addition to his accounting responsibilities, Matt is involved in marketing efforts including the creation of marketing materials using various Adobe softwares. Matt received a BBA in Finance from Baylor University in 2011 where he was also a member of Pi Kappa Phi Fraternity, Beta Gamma Sigma, and the National Society of Collegiate Scholars.

HAL MILLER, CHAIRMAN

Hal Miller is the Chairman of SCA's Board of Directors after serving as President for 10 years. During that time, he was responsible for managing SCA's global operations and guiding the company's strategic direction. Prior to joining SCA in 2004 as Vice President of Operations, Hal spent a total of 26 years working at Conoco and ConocoPhillips. He held a variety of positions including operations, exploration, and human resource management at the business unit level, and corporate level skills management for the geoscience and reservoir engineering disciplines. Hal received his undergraduate degree in 1974 from Williams College in Massachusetts and his M.S. in Geology in 1977 from the University of Colorado, where he serves on the Department of Geosciences Advisory Board.

TRAINING FORMATS

We offer over 90 courses in seven disciplines. All course materials are regularly updated to reflect the latest information and recent developments in technology. We understand the importance of producing quality training and the impact it has on your company's most valuable assets.

Register on our website at **scacompanies.com** or by e-mail at **training@scacompanies.com**.

PUBLIC COURSE

- Gain fresh perspectives from others in the industry through classroom discussions.
- Get away from the distractions of the office and allow focus on learning.
- Tuition includes continental breakfast, lunch, afternoon snacks, and beverages.
- Courses are held at our training center in Houston, TX, as well as at other US & international venues.

PRIVATE COURSE

- Save on travel and per student costs.
- Conveniently select the dates that fit with your company's schedule.
- Customize the content of our courses by incorporating your data where possible into exercises, examples, and workshops. Additional fees may apply for customization.

LIVE ONLINE COURSE

- Online versions of select courses from our catalog are offered (see p 7 for details).
- Cover the same content at a fraction of the in-person classroom cost.
- Enjoy the conveniences of learning remotely, including saving on travel expenses.
- Scheduled in half-day sessions so that attendees can manage key job responsibilities concurrently.

HOST A PUBLIC COURSE

- In exchange for providing the venue and lunches, your company will receive discount pricing.
- Enjoy the convenience of setting the course dates to fit your company's schedule.
- Eliminate your company's travel costs.

LUNCH & LEARNS, SEMINARS, & CONFERENCES

- Our experts can deliver talks on a variety of technical topics well-suited for private lunch & learn presentations or society functions.
- All talks qualify for continuing education credits.

Contact Mary Atchison, Vice President of Training at **matchison@scacompanies.com** or (713)789-2444.

COURSES OFFERED IN A LIVE ONLINE FORMAT

GEOSCIENCE

- Applied Biostratigraphy in Oil and Gas Exploration and Production | William Krebs, PhD | Page 14
- Applied Seismic Interpretation | James J. Willis, PhD | Page 15
- Carbonate Sedimentology and Sequence Stratigraphy | Oscar Lopez-Gamundi, PhD | Page 16
- Elements of Energy Geology - Basin Analysis & Subsurface Energy Storage | Stephen A. Sonnenberg, PhD | Page 17
- Elements of Petroleum Geology | Stephen A. Sonnenberg, PhD | Page 17
- Geology-Based Topical Contouring Workshops | Bob Shoup | Page 18
- Reservoir Characterization for Mudrock Reservoirs | Stephen A. Sonnenberg, PhD | Page 21
- Reservoir Characterization of Clastic (Sandstone) Reservoirs | Lesli J. Wood, PhD | Page 21
- Seal and Reservoir Pressures Analysis for E&P Prospect's Risk Assessment | Selim Shaker, PhD | Page 22
- Seismic Geomorphology | Lesli Wood, PhD | Page 23
- Sequence Stratigraphy Applied to Oil and Gas Exploration | Oscar Lopez-Gamundi, PhD | Page 23
- Structural Styles in Petroleum Exploration and Production | Lansing Taylor, PhD | Page 24

ENGINEERING

- Applied Drilling Engineering Optimization for Drilling Engineers | Robello Sameul, PhD | Page 32
- Applied Drillstring Mechanics for Drilling Engineers | Robello Samuel, PhD | Page 32
- Cement Repair Workshop | William K. Ott, PhD | Page 33
- Data Analytics Workflows for Artificial Lift, Production and Facility Engineers | Rajan N. Chokshi, PhD | Page 33
- Developing Robust Production Forecasts: Do's and Don'ts | Srini Prasad | Page 34
- For Safe Drilling: Formation – Fracture Pressure Interpretations and Analysis | Selim Shaker, PhD | Page 34
- Gas-Lift & Deliquification Applications | Rajan N. Chokshi, PhD | Page 35
- How to Maximize the Value of Conventional Oil Reservoir Developments: Best Practices | Srini Prasad | Page 35
- Managing Mature Oilfields and Capacitance-Resistance Modelling | Larry Lake, PhD and Jerry Jensen, PhD | Page 36
- Principles and Practices of Mud Motor | Robello Samuel, PhD | Page 36
- PRMS and SEC Reserves and Resources Regulations | W. John Lee, PhD | Page 37
- Producing Unconventional with Gas Lift - From Annular to PAGL to Plunger Lift and In-Between | Rajan N. Chokshi, PhD | Page 37
- Production Forecasting for Low Permeability Reservoirs | W. John Lee, PhD | Page 38
- Reserves Estimation | W. John Lee, PhD | Page 38

UNCONVENTIONAL RESERVOIRS

- "Best Practices" for New Well Fracs and Legacy Well Refracs | Robert 'Bob' Barba | Page 40
- Hydraulic Fracturing: Theory & Application | Jennifer Miskimins, PhD | Page 41
- Reservoir Management of Unconventional Reservoirs: From Inception to Maturity | Shah Kabir | Page 41
- Unconventional Resource Plays - Workshop | Stephen A. Sonnenberg, PhD | Page 43

ENERGY TRANSITION

- Carbon Capture Utilization and Storage - A Gelogical Perspective | Stephen A. Sonnenberg, PhD | Page 45
- Carbon Capture Utilization and Storage - An Engineering Perspective | Christine Ehlig-Economides, PhD and Dimitrios Hatzignatiou, PhD | Page 45
- Energy Transition for Petroleum Professionals | Nathan Meehan, PhD, PE | Page 45
- Fundamentals of CO_2 Sequestration: Mechanisms and Processes | Dimitrios Hatzignatiou, PhD | Page 46
- Geomechanics Aspects of CCUS Projects | Ewerton Araujo, PhD, Fermin Fernandez-Ibañez, PhD, and Jorge Pastor, PhD | Page 46
- Geomechanics for Geothermal Projects | Ewerton Araujo, PhD, Fermin Fernandez-Ibañez, PhD, and Jorge Pastor, PhD | Page 46
- Geothermal Energy | Birol Dindoruk, PhD and Silviu Livescu, PhD | Page 47
- Navigating CCUS – Coast Region – Workshop | PK Pande, PE | Page 47
- Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects | Robert 'Bob' Barba | Page 47

FORMATION EVALUATION

- Cased Hole and Production Log Evaluation | Robert 'Bob' Barba | Page 49
- Pore Pressure, Fracture Pressure, and Well-Bore Stability | Selim Shaker, PhD | Page 49
- Practical Interpretation of Open Hole Logs | Robert 'Bob' Barba | Page 50
- Pressure Transient Test Design and Interpretation | Christine Ehlig-Economides, PhD | Page 50

MULTI-DISCIPLINARY & INTRODUCTORY

- The Daniel J. Tearpock Geoscience Certification Program (aka "Geoscience Boot Camp") | SCA Staff | Page 53
- Basic Petroleum Engineering for Non-Engineers | Susan Howes, PE, PHR | Page 53
- Basic Reservoir Engineering for Non-Petroleum Engineers | Christine Ehlig-Economides, PhD | Page 54
- Basics of the Petroleum Industry | Susan Howes, PE, PHR | Page 54
- Introduction to Decision Framing for Project Management | Ellen Coopersmith and Ryan Spence | Page 55
- Introduction to Subsurface Machine Learning | Siddharth Misra, PhD | Page 55
- Justifying Data - Value of Information Course | Ellen Coopersmith and Ryan Spence | Page 55
- Project Management Professional Exam Prep Course | Jill Almaguer, PE, PMP | Page 56

COURSES LISTED BY PRIMARY DISCIPLINE

GEOSCIENCE	INSTRUCTOR(S)	PG
Applied Biostratigraphy in Oil and Gas Exploration and Production	Krebs	14
Applied Contouring Methods Workshop	Agah	14
Applied Deep-Water Sedimentology & Stratigraphy	Rotzien	14
Applied Seismic Interpretation Workshop	Willis	15
Applied Subsurface Geological Mapping	Shoup, Brenneke, or Agah	15
AVO, Inversion and Attributes: Principles and Applications	Willis	16
Carbonate Sedimentology and Sequence Stratigraphy	Lopez-Gamundi	16
Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop NEW	Shoup & Olson	16
Effective Petroleum Systems Analysis NEW	Shoup	17
Elements of Energy Geology: Basin Analysis & Subsurface Energy Storage NEW	Sonnenberg	17
Elements of Petroleum Geology	Sonnenberg	17
Geology-Based Topical Contouring Workshops NEW	Shoup	18
Geosteering: Best Practices, Pitfalls, & Applied Solutions	Woolsey	18
Integrated Deepwater Depositional and Petroleum Systems	Prather	18
Mapping & Interpreting Clastic Reservoirs	Shoup	19
Mapping Seismic Data Workshop	Cherry	19
Principles of Mapping with Petrel©	Green	19
Project Management for Exploration and Development Projects NEW	Shoup	20
Quality Assurance/Quality Control Skills in Subsurface Mapping (QAQC)	Shoup or Brenneke	20
Quality Control Techniques for Reviewing Prospects and Acquisitions	Shoup	21
Reservoir Characterization for Mudrock Reservoirs	Sonnenberg	21
Reservoir Characterization of Clastic (Sandstone) Reservoirs	Wood	21
Resource Assessment and Risk and Uncertainty Management NEW	Shoup	22
Rock Physics, Well Logs, and Well Tie for Seismic Exploration and Production NEW	Tura	22
Seal and Reservoir Pressures Analysis for E&P Prospect's Risk Assessment	Shaker	22
Seismic Geomorphology NEW	Wood	23
Sequence Stratigraphy Applied to Oil & Gas Exploration	Lopez-Gamundi	23
Structural Geology & Tectonics as Applied to Upstream Problems	Granath	24
Structural Styles in Petroleum Exploration and Production	Taylor	24
The Practice of Seismic Stratigraphy in Deepwater Settings	Prather	24
Time-Lapse and Multicomponent Seismic NEW	Tura	25
Well Tie Workshop	Cherry	25

ENGINEERING	INSTRUCTOR(S)	PG
Applied Drilling Engineering Optimization for Drilling Engineers	Samuel	32
Applied Drillstring Mechanics for Drilling Engineers	Samuel	32
Artificial Lift and Production Optimization Solutions	Chokshi	32
Artificial Neural Systems in Petroleum Engineering NEW	Shelley	33

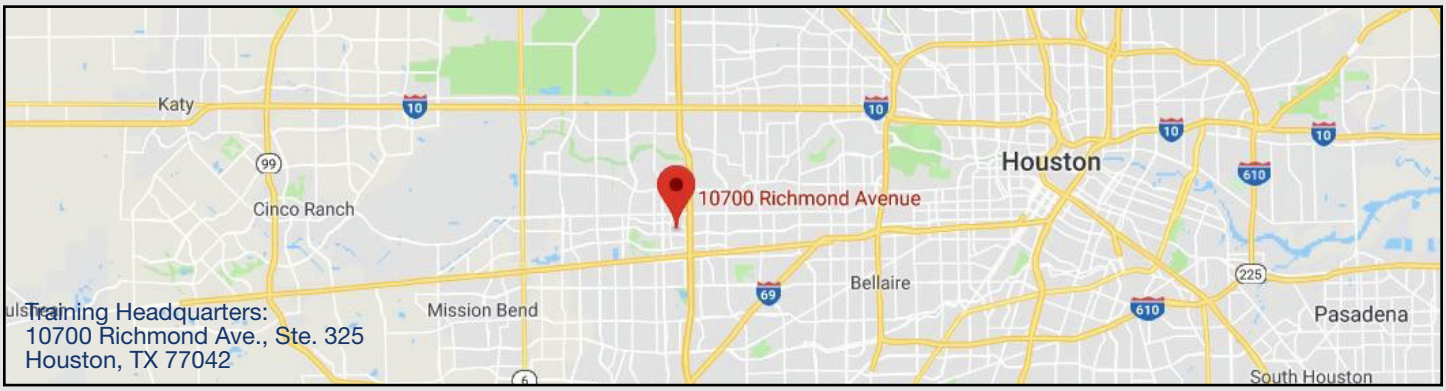
LEGEND: Flagship Course · Boot Camp Course · Laptop Required · NEW New Course · Live Online Version Available

Cement Repair Workshop	Ott	33
Data Analytics Workflows for Artificial Lift, Production, and Facility Engineers NEW	Chokshi	33
Developing Robust Production Forecasts: Do's and Dont's	Prasad	34
For Safe Drilling: Formation - Fracture Pressure Interpretations and Analysis NEW	Shaker	34
Gas-Lift & Deliquification Applications NEW	Chokshi	35
How to Maximize the Value of Conventional Oil Reservoir Developments: Best Practices	Prasad	35
In-Well Fiber-Optic Sensing NEW	Dria	35
Managing Mature Oilfields with Capacitance-Resistance Modelling	Lake & Jensen	36
Principles and Practices of Mud Motor	Samuel	36
PRMS and SEC Reserves and Resources Regulations	Lee	37
Producing Unconventional with Gas Lift - From Annular to PAGL to Plunger Lift and In-Between NEW	Chokshi	37
Production Forecasting for Low Permeability Reservoirs	Lee	38
Reserves Estimation NEW	Lee	38
UNCONVENTIONAL RESERVOIRS	**INSTRUCTOR(S)**	**PG**
Artificial Lift and Real-Time Optimization for Unconventional Assets	Chokshi	40
"Best Practices" for New Well Fracs and Legacy Well Refracs NEW	Barba	40
Hydraulic Fracturing: Theory and Application	Miskimins	41
Reservoir Management of Unconventional Reservoirs: From Inception to Maturity	Kabir	41
Shale Reservoir Core Workshop: Sedimentologic and Stratigraphic Assessment of Organic-Rich Mudrock	Hammes	42
Shale Reservoir Workshop: Analyzing Organic-Rich Mudrocks from Basin to Nano-Scale	Hammes	42
Unconventional Oil and Gas*	Caligari	43
Unconventional Resource Plays - Workshop	Sonnenberg	43
ENERGY TRANSITION	**INSTRUCTOR(S)**	**PG**
Carbon Capture Utilization and Storage - An Engineering Perspective	Ehlig-Economides & Hatzignatiou	45
Carbon Capture Utilization and Storage - A Geological Perspective	Sonnenberg	45
Energy Transition for Petroleum Professionals	Meehan	45
Fundamentals of CO_2 Sequestration: Mechanisms and Processes NEW	Hatzignatiou	46
Geomechanics Aspects of CCS Projects NEW	Araujo, Fernandez-Ibañez, Pastor	46
Geomechanics for Geothermal Projects NEW	Araujo, Fernandez-Ibañez, Pastor	46
Geothermal Energy NEW	Livescu & Dindoruk	47
Navigating CCUS – Gulf Coast Region – Workshop NEW	Pande	47
Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects NEW	Barba	47
FORMATION EVALUATION	**INSTRUCTOR(S)**	**PG**
Cased Hole and Production Log Evaluation	Barba	49
Pore Pressure, Fracture Pressure and Well-Bore Stability	Shaker	49
Practical Interpretation of Open Hole Logs	Barba	50
Pressure Transient Test Design and Interpretation	Ehlig-Economides	50
Visual Rock Characterization	Merrill	50

MULTI-DISCIPLINARY & INTRODUCTORY	INSTRUCTOR(S)	PG
The Daniel J. Tearpock Geoscience Certification Program (aka "Boot Camp")	SCA Staff	53
Basic Petroleum Economics NEW	Howes	53
Basic Petroleum Engineering for Non-Engineers	Howes	53
Basic Petroleum Operations*	Caligari	54
Basic Reservoir Engineering for Non-Petroleum Engineers	Ehlig-Economides	54
Basics of the Petroleum Industry	Howes or Miller	54
Introduction to Decision Framing for Project Management NEW	Coopersmith & Spence	55
Introduction to Subsurface Machine Learning NEW	Misra	55
Justifying Data - Value of Information Course NEW	Coopersmith & Spence	55
Petroleum Engineering Fundamentals*	Caligari	56
Project Management Professional Exam Prep Course	Almaguer	56
FIELD COURSES	**INSTRUCTOR(S)**	**PG**
Basin-Floor Fan Systems (South-Central Pyrenees, Spain)	Cossey	58
Big Bend Field Course	Carlson	58
Carbonate Reservoirs of the Permian Basin NW Shelf NEW	Taylor	59
Deepwater Jackfork Field Course (Arkansas – Oklahoma) NEW	Wood	59
Deepwater Jackfork and Atoka Field Course (Arkansas – Oklahoma) NEW	Wood	59
Deepwater Systems, Ainsa Basin, Spanish Pyrenees: Application to Hydrocarbon Prospectivity and Unconventional Plays	Pickering & Cossey	60
High-Continuity Sandy Turbidite System: Application to Hydrocarbon Prospectivity (SE France)	Pickering & Cossey	60
Modern Coastal Systems of Texas Field Course (Galveston, Texas)	Wellner	60
Modern Depositional Systems as Analogs for Subsurface Characterization (Galveston, Texas) NEW	Olson	61
Structural and Sequence Stratigraphic Field Course (Hill Country, Texas)	Taylor	61
Structural Styles and Tectono-Stratigraphy for the Mid-Continent NEW	Taylor	62
The Book Cliffs, Utah: A Case Study in Coastal Sequence Stratigraphy (Utah)	Little	62

**This course is offered in Spanish*

LEGEND: Flagship Course | Boot Camp Course | Laptop Required | NEW New Course | Live Online Version Available



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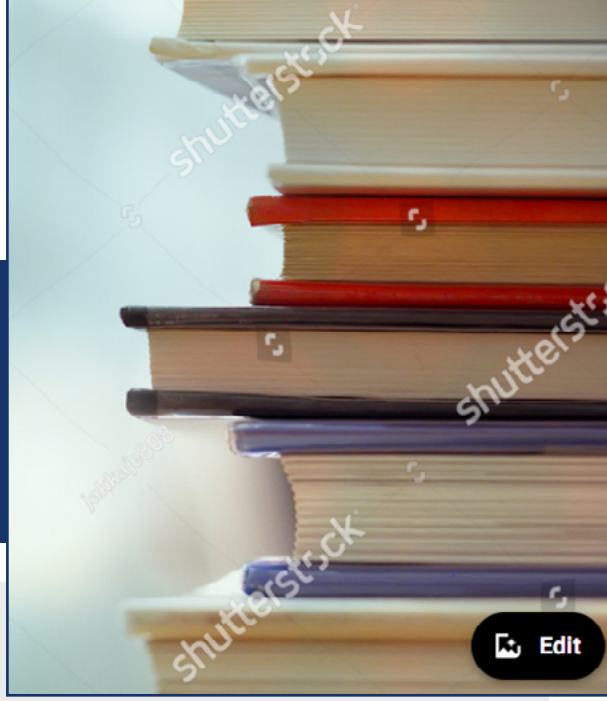
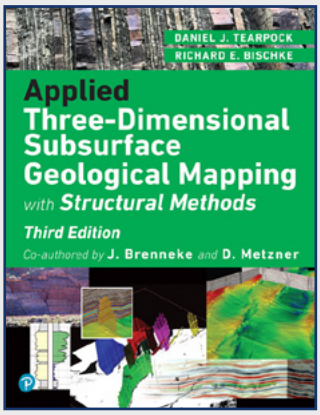


PUBLICATIONS

SCA's two renowned publications are essential for the energy industry professional and available for purchase at **scacompanies.com/resources**.

Applied Three-Dimensional Subsurface Geological Mapping with Structural Methods, 3rd Edition

Authored by Daniel J. Tearpock and Richard E. Bishke



As one of the world's most referenced texts on subsurface interpretation, mapping, and structural geological methods, this distinguished textbook is the basis for our flagship course titled, "Applied Subsurface Geological Mapping". We offer this fundamental five-day course in our training facility in Houston, Texas and locations around the world. A copy of the textbook is included for students.

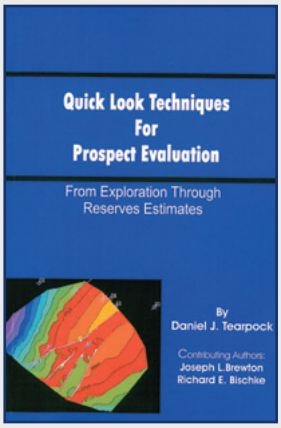
Course learning outcomes include:

- Understand the application of different hand contouring methods.
- Study the pitfalls of selected computer contouring methods.
- Learn how to integrate fault data from well logs and seismic data.
- Generate fault surface interpretations and maps.
- Understand the construction and application of various types of cross sections.
- Generate net pay isochore maps for both bottom and edge water reservoirs.

Learn more about this course on pages **15** and **27**.

Quick Look Techniques for Prospect Evaluation: From Exploration Through Reserves Estimates

Authored by Daniel J. Tearpock



Another must-have textbook, this publication will benefit anyone who screens deals, reviews interpretations and maps, or evaluates prospects or potential resources or reserves. If you are interested in learning about and applying quick look techniques in a classroom setting, SCA offers a three-day course titled, "QC Techniques for Reviewing Prospects & Acquisitions".

Course learning outcomes include:

- Quickly audit a map for accuracy and validity.
- Evaluate the three-dimensional viability of an interpretation or map.
- Evaluate whether the resources or reserves attributed to a completed interpretation or map are under- or over-estimated.
- Determine whether an interpreter has applied sound, industry accepted geoscience principles and methods to generate a map.

Learn more about this course on pages **21** and **29**.

REGISTRATION TERMS AND CONDITIONS

Due to limited seats in each course, it is recommended that participants register at least one month in advance. However, we will accept paid registrations up to the last business day before a confirmed class, provided there are seats available. Registrants will receive a confirmation email within 48 hours of registration and venue information at least two weeks prior to the first day of class. The final decision to hold a course is generally made two weeks prior to the course start date.

REMINDER: Your seat in a course is not confirmed until payment has been received.

TUITION

Tuition for course registrations are valid until 12 months have passed from the start date of the class, at which time payments become nonrefundable. An invoice can be provided via email as long as payment is received before the start of class. Tuition is payable in USD and does not include the cost of accommodation and travel, but does include course materials and daily refreshments.

TRANSFERS

If a student elects to apply their registration fee to a different course, notification of the transfer must be received at least two (2) weeks prior to the original course start date.

SUBSTITUTIONS

Substituting a student for another is accepted without penalty if notification is received at least seven (7) days prior to the course start date. In addition, SCA reserves the right to substitute course instructors as necessary.

CANCELLATIONS & REFUNDS

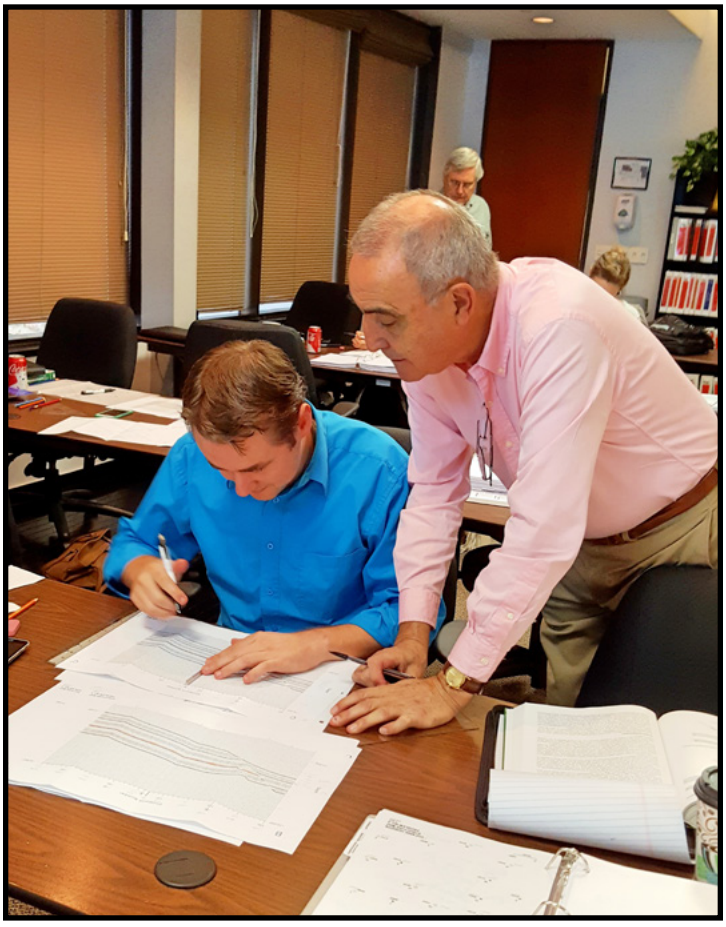
FULL REFUND: If it is necessary to cancel an enrollment, the tuition will be reimbursed in full provided notification of the cancellation is received earlier than four weeks prior to the course start date. SCA will issue the refund in full within 3-5 business days via the same method that the registration was initially made (credit card, check, etc) unless requested otherwise.

10% PENALTY: For cancellations received less than four weeks but earlier than two weeks in advance of the course start date, a late cancellation fee of 10% will be withheld from the refund.

25% PENALTY: If a cancellation is received less than two weeks before the course start date, a late cancellation fee of 25% will be withheld from the refund.

SCA reserves the right to cancel any course session at any time. The final decision to hold a course is typically made two weeks prior to the scheduled start date. If a course is canceled, registrants will be notified via email and given the opportunity to transfer to another course or receive a refund. NOTE: Should there be a difference in the tuition, the difference will be refunded on or before the start of the class. **SCA is not responsible for any penalties incurred for having to cancel or change your own travel arrangements.** Please keep our cancellation policy in mind when planning your travel.

VISIT OFTEN: Due to the regular addition of new training courses, please visit our website at **scacompanies.com** frequently for the latest calendar of courses. SCA strives to offer the best curriculum and schedule possible.



Pictured Above: SCA's instructor **Sia Agah** assisting a student during an offering of **Applied Subsurface Geological Mapping**.

training@scacompanies.com • (713)789-2444

Excellence That Runs Deep

SCA's training courses are designed for all experience levels, including early career geoscience or engineering graduates, newcomers to the energy industry, investors, mid-career and senior-level professionals, and managers looking to hone and update their skills.

Geoscience • Engineering • Energy Transition

Unconventional Reservoirs • Formation Evaluation

Multi-Disciplinary & Introductory • Field Courses

APPLIED BIOSTRATIGRAPHY IN OIL AND GAS EXPLORATION AND PRODUCTION

Instructor: William Krebs, PhD
Discipline: Geoscience
Length: 2 Days (Classroom), 3 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Private
Format: In-Peron & Live Online

Who Should Attend:
Geoscientists in exploration and production interested in using biostratigraphic data in their projects.

Course Description:
This two-day course will introduce the microfossil groups that are commonly used in the petroleum industry, their strengths and limitations, and their application to chronostratigraphic and paleoenvironmental analysis. Biozonation schemes will be compared to graphic correlation analysis - constructing and using composite standards, their calibration to geologic time, and interpreting the results in the framework of sequence stratigraphy and chronostratigraphy. A key outcome of the course is the identification of unconformities and condensed sections, paleoenvironments and provenance, potential reservoir, seal, and source rocks, the calibration of seismic and geologic data to geologic time, estimates of sedimentation rates and the duration of hiatuses, and the correlation of rock and seismic sections to help find and produce hydrocarbons.

Learning Outcomes:
- Know the key microfossil groups and when and how to use them.
- Compare the traditional biozonation approach to graphic correlation analysis.
- Learn how to construct composite standards from biostratigraphic data and how to use them for graphic correlation analysis.
- Using graphic correlation in sequence stratigraphy and chronostratigraphy.
- Integration of the results with seismic and geologic datasets.

Course Content:
- Useful microfossil groups, their application and limitations.
- Biozonations vs. graphic correlation analysis.
- Graphic correlation, the use of composite standards, their calibration to geologic time and interpretation of the results.
- Graphic correlation, sequence stratigraphy, chronostratigraphy, and chronosequence stratigraphy.
- Well correlations, seismic and geologic integration, and interpretation.

Participant Testimonials:
"Likely one of the best instructors I have ever encountered."

"Dr. Krebs taught with enthusiasm and deep knowledge of the subject matter." - Kim C.

"A well put together program with the perfect balance of lecture and practice work." - Anna E.

APPLIED CONTOURING METHODS WORKSHOP

Instructor: Sia Agah
Discipline: Geoscience
Length: 1-3 Days
CEUs: 0.8-2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, petrophysicists, reservoir engineers and managers who are exploring for and developing oil and gas fields in conventional and unconventional petroleum systems.

Course Description:
Participants will learn proper subsurface interpretation and contouring methodology through hand-contoured mapping exercises. Hand contouring encourages formulation of a geologic model which will guide or validate subsequent interpretation utilizing the workstation. A primary objective is to enable editing of workstation products by manually inserting control points and contours prior to gridding to generate geologically valid maps, especially when the computer-generated map is deemed geologically unreasonable or invalid.

Situations where manual editing may be required include mapping with widely scattered data (e.g., porosity, net sand and net pay values from wells), mapping 2D seismic data, dealing with poor resolution deep 3D seismic events, editing fault blocks on workstation generated maps which lack contour compatibility, or adjusting net pay maps when the mapping software is incapable of correct net pay contouring.

Learning Outcomes:
- The benefits of performing hand contouring in the age of 3D seismic and computers.
- Rules of contouring and methods of contouring by hand.
- Correct understanding and mapping of the vertical components of faults including throw and vertical separation.
- Understanding of contour compatibility or continuity of structural style across faults.
- Fault patterns and additive property of faults (a balancing principle), with contouring examples.
- Adjusting the contouring of a 3D data set to remediate a possible "screw fault" interpretation (faults which appear to change their sense of displacement along strike).
- Contouring widely-spaced well and 2D data, including mapping a reef reservoir with incompatible top and base surfaces.
- Generating a stratigraphic oil play by imposing a channel sand porosity model on the contour maps.
- Generating net pay maps for edge-water reservoirs with top- and base-reservoir (derivative) structure maps, net-to-gross ratio, and net sand (derivative) maps.

Course Content:
Short lectures and up to 12 exercises requiring generation of contour maps. Depending on course duration, the exercises could include structure, isochore, net-to-gross ratio, porosity, net sand, net pay and derivative maps made by cross contouring of other relevant maps.

The one-day class covers four exercises, the two-day class covers 10, and the three-day version covers all 12.

APPLIED DEEP-WATER SEDIMENTOLOGY & STRATIGRAPHY

Instructor: Jonathan R. Rotzien, PhD
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
This course is designed for employees primarily interested in siliciclastic sedimentation, stratigraphy and petroleum reservoirs as they pertain to the exploration and development of oil and natural gas. Professionals may be engaged in technical to management positions.

Course Description:
This five-day seminar is designed to provide professionals with a modern awareness of the spectrum of deep-water sedimentation, stratigraphy and depositional environments. Taught from the perspective of an upstream oil and gas business unit, diverse industry datasets are used throughout the course to illustrate the broad variation of deep-water sedimentation and the implications for petroleum reservoirs and their quality. This course explores the transport processes and depositional products in a variety of deep-water depositional systems along active and passive margins using outcrop, core, borehole image and seismic data.

This course is designed to give industry professionals an appreciation of the predictive attributes of deep-water sedimentation, stratigraphy and resulting petroleum reservoirs, as well as knowledgeable insight into the scale of the wide range of deep-water depositional environments. This course draws from materials presented in field courses to world-class outcrops and petroleum basins in North America, Europe and Asia Pacific. The modifying term "deep-water" is often misunderstood, and it does not imply that these types of rocks are found only in modern offshore environments. Rather, many of the petroliferous basins onshore today are filled with shallow- and deep-water marine and freshwater (lacustrine) strata including turbidites and intervals of interbedded mudstone.

Learning Outcomes:
- Describe transport and depositional processes for the different types of sedimentary deposits that function as important parts of a total petroleum system.
- Characterize turbidites, debrites, transitional to hybrid flow type deposits, reworked deposits and contourites, hemipelagic to pelagic deposits and describe their distribution in deep-water environments.
- Understand the different types of deep-water siliciclastic depositional environments for turbidite, debrite, contourite, mass-transport and mixed depositional systems and their implications to petroleum reservoir architecture and reservoir quality.
- Use lithofacies analysis to understand 3D variations in rock properties pertaining to reservoir type, reservoir quality, and seal.
- Understand how grain-scale variations largely determined by sedimentary provenance, weathering and transport factors affect reservoir quality.
- Integrate seismic, outcrop, core, and other oil and gas industry data at multiple scales to learn about sedimentary transport processes and depositional products.
- Use modern and ancient DW depositional systems to understand geologic risk and uncertainty pertaining to reservoir presence, reservoir quality and seal presence.

APPLIED SEISMIC INTERPRETATION WORKSHOP

Instructor: James J. Willis, PhD
Discipline: Geoscience
Length: 2-3 Days (Classroom), 4-6 Half-Day Sessions (Live Online)
CEUs: 1.6-2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Petroleum geoscientists, petroleum engineers and those interacting with or supporting these professionals in the search for or the exploitation of hydrocarbons.

Course Description:
In this three-day course, participants review and apply the basics of seismic interpretation as related to oil and gas exploration, development and production. During the first morning, there is a review of the geophysical principles of reflection seismology without getting deeply into the math. This includes a brief look at seismic acquisition and processing. The first afternoon focuses on tying well data to seismic lines and structural (fault) interpretation. A major exercise has students generate a time structure map in a complexly faulted area.

Day two covers three main topics: (1) mapping seismic sequence boundaries, (2) interpreting depositional environments and likely sedimentary facies, and (3) estimating ultimate recovery for a prospect or newly discovered field.

Learning Outcomes:
- Understand the basic physics behind reflection seismology.
- Comprehend the seismic display and its limitations.
- Explain the main types of seismic interpretation methods.
- Conduct a well-to-seismic tie (transfer of horizons and faults).
- Identify and map a series of major faults using seismic data.
- Recognize and map seismic sequence boundaries.
- Develop a time structure map, including fault traces.
- Use reflection geometries and attributes to predict depositional environments.
- Determine the EUR (estimated ultimate recovery) for a prospect or discovery.

Course Content:
- What generates seismic reflections?
- What happens before interpretation begins?
- Seismic displays and their limitations
- Basic seismic interpretation methods
- Relating well data to seismic data
- Extracting structural information
- Extracting stratigraphic information
- Generating time structure maps
- Predicting depositional environments & facies
- Estimating EUR (estimated ultimate recovery)

"The only thing worse than training your employees and having them leave is not training them and having them stay."
Henry Ford

FEATURED INSTRUCTOR:
Sia Agah

Sia Agah has taught Applied Subsurface Geological Mapping (ASGM) over 150 times, having first taught it in 2002 under the guidance of SCA's founder and class creator, Dan Tearpock. Sia holds an MA in Petroleum Geology from the University of London. He was with the National Iranian Oil Co. (NIOC) for 13 years until 1979 when he joined Conoco. While there, he worked as Senior Geologist, Chief Geologist, Exploration Manager, and New Ventures Vice President in Houston, Tunisia, Angola, and the UAE (Dubai), respectively. After early retirement in 1997, Sia moved to UMC/Ocean Energy to set up and manage their South Asia - Middle East Exploration Department and manage seven exploration blocks in Pakistan, Bangladesh, and Yemen. He has an extensive knowledge of the petroleum geology of the Middle East, South Asia, North Africa, and Offshore West Africa, and Brazil.

Courses Taught:
- Applied Contouring Methods Workshop
- Applied Subsurface Geological Mapping

FEATURED INSTRUCTOR:
Jim Brenneke

Jim Brenneke graduated from Augustana College with a BA in Geology and an MS in Geology from the University of Illinois. He joined Shell Oil Company (US) and worked for various Shell subsidiaries in research, international exploration, and domestic exploration and production. He then joined Subsurface Consultants and Associates, LLC (SCA) as a consulting geoscientist. In addition to consulting, he assumed various management roles with SCA including Technical Manager, Vice President of Geology & Engineering, and Treasurer. He then joined BP's deepwater Gulf of Mexico (GoM) Production organization. Jim has contributed to numerous exploration discoveries, field extensions, and development wells in his 40 years in the industry.

Courses Taught:
- Applied Subsurface Geological Mapping
- Quality Assurance/Quality Control Skills in Subsurface Mapping

APPLIED SUBSURFACE GEOLOGICAL MAPPING
Flagship Course

Instructor: Sia Agah, Bob Shoup, or Jim Brenneke
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, engineers, managers, support staff involved in exploration or development.

Course Description:
This course covers fundamental and advanced methods of subsurface mapping used by the most proficient exploration and development geoscientists in the industry, as well as an introduction to recent advances in interpretation. Mapping techniques, examples and exercises for extensional and compressional tectonic settings are the core of the course. Diapiric and strike-slip faulted structures are discussed. Volumetric mapping is presented, and numerous pitfalls in reservoir volume determinations using isochore maps.

This course provides the applied, hands-on knowledge required to generate sound subsurface maps. Subsurface geologic maps are important and widely used documents in petroleum exploration and development. Geoscientists and engineers must understand and be able to efficiently and accurately generate many types of subsurface maps. Many geoscientists have not had formal training in the fundamental principles and methods that underlie accurately constructed subsurface maps, whether the data source is a seismic interpretation, well log correlation or both. Participants of this course will receive the *Applied Three-Dimensional Subsurface Geological Mapping with Structural Methods* textbook and a lab manual with exercises.

Learning Outcomes:
- Understand the application of different hand contouring and the pitfalls of selected computer contouring methods.
- Capability of integrating fault data from well logs and seismic data.
- Create fault surface interpretations and maps.
- Understand the construction and application of various types of cross sections.
- Generate net pay isochore maps for both bottom and edge water reservoirs.

Course Content:
- Philosophical doctrine, workflow and methodology of mapping
- Contouring and contouring techniques
- Directionally drilled wells and directional surveys (applications to mapping)
- Log correlation techniques for vertical and deviated wells (applications to mapping)
- Integration of geophysical data in subsurface mapping
- Cross section construction for extensional, compressional strike-slip and diapiric tectonic settings
- Fault surface mapping using well log and seismic data
- Structure mapping in extensional, compressional, strike-slip and diapiric tectonic settings
- Isochore map construction (bottom water and edge water reservoirs)
- Net sand and pay correction factors for directionally drilled wells
- Structure vs porosity top mapping
- Walking wells
- Fault wedge mapping
- Pitfalls of computer generated maps
- Volumetric calculations
- Isopach map construction

AVO, INVERSION AND ATTRIBUTES: PRINCIPLES AND APPLICATIONS

Instructor: James J. Willis, PhD
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, petrophysicists, reservoir engineers, and exploration/production managers.

Course Description:
This course provides an understanding of the evolving role of seismic petrophysics through the use of amplitude variations with offset or angle (AVO/AVA), attributes, and inversion techniques. Understanding rock physics and the behavior of the propagating seismic waves represents an integral part of the course, especially in the context of specific applications including enhanced seismic interpretation, rock and fluid characterization, including hydrocarbon identification and quantification, fracture identification, and stress/geomechanical analysis. Course concepts are enhanced by numerous practical exercises and case studies..

Learning Outcomes:
- Understand the fundamentals of seismic wave propagation and specific attributes of seismic measurements toward enhanced interpretation and petrophysics.
- Learn the pros and cons of various attributes in various facets of investigation, including stratigraphy/sedimentology, structural geology and geomechanics, and seismic petrophysics.
- Learn how to determine elastic properties from AVO/AVA analysis for fluid and lithologic discrimination.
- Learn how to integrate well data through seismic inversion techniques.
- Understand the role of seismic attribute analysis and related techniques in understanding risk elements from exploration, drilling and completion, and development stages.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS.

Course Content:
- Introductory Interpretation Exercises
- Review of the Seismic Process
  - Review of seismic fundamentals
- General Seismic Interpretation
- Seismic Attributes Analysis
- AVO Analysis
  - In-depth investigation into amplitude versus offset (angel) analysis
- Seismic Inversion
  - Examination of techniques and benefits of seismic inversion
- Borehole Seismology
  - Borehole seismic measurements and techniques
- Enhanced Fault Interpretation from Seismic Attributes
  - Extracting more fault information from seismic data
- Seismic Anistropy Analysis
  - Fracture ID
  - Stress Analysis from Seismic Data
- Reservoir Characterization and Understanding Risk
  - Summary discussion of the role of seismic data and analysis in integrative studies
- Case Studies
- Exercises
  - Numerous hands-on exercises throughout the course to enhance understanding of key concepts and topics

CARBONATE SEDIMENTOLOGY AND SEQUENCE STRATIGRAPHY

Instructor: Oscar Lopez-Gamundi, PhD
Discipline: Geoscience
Length: 5 Days (Classroom), 10 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Designed for geologist, geophysicists, and engineers actively working in the exploration and production of carbonate rocks.

Course Description:
This five-day course covers the basic concepts of carbonate sedimentology and sequence stratigraphy with emphasis on their practical applications for oil and gas exploration, appraisal and production. All concepts are illustrated with examples of outcrop well-log, core and seismic data.

Learning Outcomes:
The ultimate objective of the course is to provide the geologists, geophysicists and engineers with tools and methodologies of carbonate sedimentology and sequence stratigraphy to effectively predict the presence and quality of reservoir, source rock and seal.

Course Content:
- Principles of Carbonate Production
  - Modes of marine precipitation, carbonate-specific aspects of deposition and erosion.
  - Differences with clastic sedimentation. Carbonate mineralogy and diagenesis.
  - Classification of carbonate rocks.
- Marine Modern Carbonate Environments and Facies Models.
- Carbonate Depositional Systems: Marine shallow-water and deep-water carbonates.
- Non-Marine (lacustrine) Carbonates.
- Geometry of carbonate accumulations: ramp, platforms, slope, localized accumulations, reefs and subtypes. Wilson's facies belts.
- Carbonate Sequence Stratigraphy.
  - Systems tracts: lowstand (LST) transgressive (TST) and highstand (HST) system tracts.
  - Relative sea level changes deduced from seismic. Shoreline trajectory.
  - The catch-up and keep-up highstand platform models.
  - Lowstand deposits: allochthonous wedges, autochthonous wedges and platform/bank margin wedges.
- Selected Examples:
  - Anatomy of a reef: The Capitan Reef (Permian), Texas, USA
  - An isolated carbonate platform: the supergiant Tengiz Field (Carboniferous), Kazakhstan
  - A seismically well-imaged, back-stepping platform, the Tertiary of the Maldives Islands
  - Microbial limestones as reservoirs: the pre-salt (Cretaceous) of offshore Brazil

"Learning never exhausts the mind."
Leonardo da Vinci

CLASTIC SEDIMENTOLOGY, STRATIGRAPHY, AND RESERVOIR CHARACTERIZATION WITH CORE WORKSHOP NEW

Instructor: Bob Shoup and Mark Olson
Discipline: Geoscience
Length: 3-5 Days (Classroom)
CEUs: 2.4 - 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
E&P professionals involved in the prediction or delineation of clastic reservoirs. The course will be particularly useful for professionals early in their career and experienced professionals new to working with clastic reservoirs.

Course Description:
The ability to predict reservoir presence or map net reservoir in clastic depositional systems is dependent on our understanding of the depositional geometries of the various depositional systems and the variation of patterns within those systems. The processes associated with sediment delivery and sediment dispersal is the fundamental control on the architectural geometry of a depositional system. The processes associated with the interplay between sediment input and accommodation space are the fundamental controls on the lateral and vertical stacking patterns within that geometry.

The geometry of the depositional system is similar regardless of the depositional location or scale. As such, the patterns within the geometries are also similar, and, therefore, predictable. This is a powerful concept that the interpreter can use in predicting depositional geometries and patterns. Whether the reservoir being studied was deposited on land or on a submarine fan, or whether it is 100's of kilometers in scale or a kilometer, the geometry of the deposit is similar. Therefore, interpreters need only become familiar with the basic geometries of clastic depositional systems and the patterns that occur within those geometries.

Learning Outcomes:
- Correlating well logs in clastic sequences utilizing shale and resistivity markers, interval thickness, sequence stacking patterns and cross-sections.
- Review the fundamental controls that influence clastic depositional systems.
- Understanding of the lateral and vertical reservoir distribution, reservoir characteristics and connectivity of braided, meandering, anastomosing, and entrenched river systems.
- Understanding of the lateral and vertical reservoir distribution, reservoir characteristics and connectivity of alluvial fans, deltas, and submarine fan systems.
- Improved ability to construct accurate sand percent maps for reservoir prediction, and net sand and net pay isochore maps for accurate reservoir characterization.
- Learn how to utilize the DAKS database for both exploration and development projects.
- Learn how to describe core, interpret depositional environments, and utilize stratigraphic concepts for reservoir characterization and prediction.

Course Content:
- Day 1: Interpreting Clastic Reservoir Systems, 10 Habits of Highly Successful Oil Finders
- Day 2: Architectural Geometries of Clastic Reservoir Systems, Alluvial Fans
- Day 3: Entrenched Rivers, Sabkha and Aeolian Deposits, Deltas
- Day 4-5: Core Workshop
  - Fluvial, shallow marine, lacustrine, deepwater

EFFECTIVE PETROLEUM SYSTEMS ANALYSIS NEW

Instructor: Bob Shoup
Discipline: Geoscience
Length: 3 Days
CEUs: 2.4
Availability: Private
Format: In-Person

Who Should Attend:
Prospect generators, property and prospect evaluators, supervisors, managers, bankers, investors and anyone involved in preparing, reviewing, or evaluating subsurface interpretations, prospects, fields and reserves or resources.

Course Description:
This course is designed to provide geoscientists with an understanding of all the elements of the petroleum system including how to put those elements together to define plays and to find leads and prospects in those plays. Moreover, the class includes a number of industry best practices that can be used to ensure that the interpreters have made valid maps and interpretations so that they can properly evaluate and risk those prospects.

Learning Outcomes:
- Understand the various types of data needed to understand the Earth Model.
- Learn how to use the data as well as geologic models and principles to understand and delineate each element of the petroleum system.
- Be able to bring the petroleum system elements together in order to define plays and to find, evaluate, and risk prospects.
- Generate Common Risk Segment maps to define play fairways.
- Ensure geological and geophysical interpretations are valid and internally consistent by honoring all the data.
- Assess uncertainty and risk in prospect evaluations.

Course Content:
- Day 1 Morning
  - Introduction, 10 Habits of Highly Successful Oil Finders, Logical Thinking On-screen Exercises; Data Integration, Data Types, Data Linkages
  - Earth Model and Play Based Exploration
  - Various Log Correlation and Cross Section Exercises
- Day 1 Afternoon
  - Cross Section Exercise, Contouring Review, Rules and Methods, and Exercise
  - Tectonic Framework, Rift Basin Geometries, Basement Mapping (Seismic, Gravity-Mag)
  - Chumphon Basin Mapping Exercise
  - Discussion of Structural Framework Exercise, Tectonic Framework; Inversion
- Day 2 Morning
  - Tectonic Framework, Salt Tectonics, Shale Tectonics, Compressional Tectonics, Strike Slip Tectonics, Seismic Correlation and Mapping Exercises
- Day 2 Afternoon
  - Stratigraphic Framework, Clastics; Delivery Systems, Dispersal Systems, Meandering River Mapping Exercise
  - Stratigraphic Framework, Clastics; Dispersal Systems (Alluvial Fan Deltas, Submarine Fans); Alluvial Fan Mapping Exercise; Submarine Fan Interpretation and Mapping Exercise
- Day 3 Morning
  - Carbonate Reservoirs, The Petroleum System, Source Rock Types, Depositional Systems, Migration, Exercise
- Day 3 Afternoon
  - Chumphon Common Risk Segment Mapping Exercise
  - Prospect Evaluation, PRMS, Uncertainty

ELEMENTS OF ENERGY GEOLOGY: BASIN ANALYSIS & SUBSURFACE ENERGY STORAGE NEW

Instructor: Stephen A. Sonnenberg, PhD
Discipline: Geoscience, Energy Transition, Multi-Disciplinary & Intro
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, and engineers who are interested in learning about energy geology from the basics to advanced topics.

Course Description:
Energy sustains civilization. This course will review the processes critical to the formation, accumulation, occurrence of geologically based energy resources. The energy transition from carbon-based energy to other types of energy is emphasized. This course is appropriate for those wanting a comprehensive understanding of important aspects of energy geology, i.e., petroleum, coal, gas hydrates, geothermal, hydrogen, helium, uranium, etc. A Systems Approach is used to discuss energy types. Many elements of energy geology are important for people working in the energy industry. Utilization of Carbon and other Energy Gases (CCS and CCU) is emphasized.

Exercises are interspersed with lectures to emphasize learning outcomes. We will build on your existing geological knowledge (particularly petrology, stratigraphy and structural geology) and engineering backgrounds to enhance your professional growth in those areas of geology, geophysics and engineering related to petroleum exploration and development.

Learning Outcomes:
- The participant will become familiar with elements of energy geology (i.e., source, reservoir, seal). This includes petrophysics (log analysis), subsurface pressure analysis (including hydrodynamics), DST analysis, subsurface water analyses, and subsurface mapping and correlation techniques.

Course Content:
The course will be centered around the concept of Energy Systems. The course will use a system approach and describe system elements (source, reservoir, seal, and overburden rocks) and processes (generation, migration, entrapment, and preservation). We will examine a) those basic factors that control generation, migration, and accumulation; b) procedures used to discover and produce those energy types; c) data collection and interpretation techniques; d) the roles and skills required of exploration and development professionals, and e) the worldwide occurrence of energy types of deposits.

Course Topics:
- Source, Seal, Generation, Migration
- Introduction & World Resources
- Sedimentary Basins, Plate Tectonics
- Energy Systems
- Energy Traps
- Utilization of Carbon and other Energy Gases (CCS and CCU)
- Reservoir Rocks, Reservoir Heterogeneity
- Fractured Reservoirs
- Porosity and Permeability
- Formation Evaluation
- Exploration Concepts for Energy Types

ELEMENTS OF PETROLEUM GEOLOGY

Instructor: Stephen A. Sonnenberg, PhD
Discipline: Geoscience, Multi-Disciplinary & Intro
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, & engineers who are interested in learning about petroleum geology (the basics to advanced topics).

Course Description:
The course will use a petroleum system approach, reviewing the elements (source, reservoir, seal, and overburden rocks) and processes (generation, migration, entrapment, and preservation). We will examine: a) those basic factors that control hydrocarbon generation, migration, and accumulation; b) procedures used to discover and produce those hydrocarbons; c) data collection and interpretation techniques; d) the roles and skills required of exploration and development professionals, and e) the worldwide occurrence of hydrocarbon deposits.

This course is appropriate for those wanting a comprehensive understanding of important aspects of petroleum geology. Exercises are interspersed with lectures to emphasize learning outcomes. Enhance your professional growth in the areas of geology, geophysics and engineering related to petroleum exploration and development.

Learning Outcomes:
- The participant will become familiar with elements of petroleum geology.
- This includes petrophysics (log analysis), source rock evaluation, capillary pressure analysis, subsurface pressure analysis (including hydrodynamics), DST analysis, subsurface water analyses, and subsurface mapping and correlation techniques.

Course Content:
- Introduction & world resources
- Sedimentary basins, plate tectonics
- Petroleum systems
- Reservoir rocks, reservoir heterogeneity
- Fractured reservoirs
- Sweet spots
- Porosity and permeability
- Petroleum traps
- Formation evaluation, Pickett, Buckles, Hingle plots
- Low resistivity & low contrast pays
- Review of chemistry of petroleum
- Organic matter types in recent sediments
- Kerogen & maturation
- Lab methods, interpretation of data, biomarkers
- Composition of crudes, natural gas
- Primary & secondary migration
- Capillary pressures
- Subsurface pressures/DST analysis
- Fluid pressure compartments
- Subsurface temperatures
- Subsurface waters
- The importance of subsurface shows
- Unconventional traps
- Risk
- Resources and reserves

GEOLOGY-BASED TOPICAL CONTOURING WORKSHOPS NEW

Instructor: Bob Shoup
Discipline: Geoscience
Length: 3-5 Days (Classroom), 12 Half-Day Sessions (Live Online)
CEUs: 2.4 - 4.0
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, petrophysicists, reservoir engineers and managers who are exploring for and developing oil and gas fields in conventional and unconventional petroleum systems.

Course Description:
This is a unique training program in which clients can design a customized three- to five-day training course comprised of critical skill modules (see workshops detailed below) coupled with hands-on exercises. There are two common management complaints: 1} My staff does not understand the geology of their prospects, and 2) My staff does not understand their maps. These workshops are designed to address and remedy both of those complaints.

Interpreters must know what they are contouring to generate a valid map. Simply relying on a computer contouring algorithm without having a fundamental understanding of what that map should look like all but guarantees bad maps and dry holes.

In each workshop, participants will learn the fundamental aspects of the geology of the setting covered in that workshop. This combined hand-contouring exercises will help interpreters better understand not just their maps, but the geology of their prospects as well.

Geological Contouring Workshops:
- Introduction: Basic Contouring
- Workshop 1: Fault Mapping (This workshop is a prerequisite for Workshops 2-6)
- Workshop 2: Rift Basin Structures
- Workshop 3: Growth Fault Structures
- Workshop 4: Salt Structures
- Workshop 5: Compressional Structures
- Workshop 6: Strike Slip Structures
- Workshop 7: Clastic Reservoirs
- Workshop 8: Carbonate Reservoirs
- Workshop 9: Formation Attributes
- Workshop 10: Isochore Maps and Resource Evaluation
- Workshop 11: Cross Section Workshop (Vertical Maps)

Format: Each workshop is a mix of lecture and paper-pencil exercises. The class can be attended in-person or in a live online format.

Learning Outcomes:
- Understand how to evaluate and validate contour maps generated in the workstation.
- Understand the methods and techniques needed to generate valid structure maps.
- Improved understanding of the geology of their plays and prospects.

GEOSTEERING: BEST PRACTICES, PITFALLS, & APPLIED SOLUTIONS

Instructor: Jamie Woolsey
Discipline: Geoscience, Unconventional Reservoirs
Length: 1 Day
CEUs: 0.8
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, engineers, managers, and field team involved with geosteered horizontal wells.

Course Description:
This course includes intermediate-level review of the topics that most often impact the geosteering effort, including best practices that account for the most common sources of difficulty. We will start with a review of "good outcomes", specifically including what defines a successful geosteering effort, plus examples from a variety of plays. Since best practices necessarily include understanding and recognition of potential pitfalls, we will take time to explore potential problems, their origins, how to recognize and mitigate them.

Learning Outcomes:
- Importance of geosteering and what realistically defines a geosteering success.
- Look more critically at pre-drill geologic work-up and potential impacts on the horizontal effort.
- Understand the pitfalls inherent to various geosteering techniques.
- Recognize LWD-MWD telemetry problems, some simple pre-drill considerations to avoid LWD telemetry problems before the well starts, plus mitigation options if the well is already underway.
- Recognize deficient LWD data, especially gamma curves, plus a few simple approaches when faced with these problems.
- Become familiar with Positional Uncertainty (survey imprecision), plus defensive strategies and rules of thumb to mitigate impacts.
- Understand the cultural issues at play within the horizontal well team, plus some easy communication strategies to reduce inter-disciplinary conflict and miscommunication.
- Understand best practices for each phase of a horizontal well from origination, through drilling, and into post-drill use of the new data.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS.

Course Content:
- Introduction and Definition of Successful Geosteering
  - Specifically, what is the main priority?
  - Examples of effective and ineffectively steered wells
- Pre-Drill Geologic Analysis - Common Relevant Pitfalls
  - Matter of resolution plus over-dependence on technology, over-confidence in deficient data, and interpretive bias
- Geosteering Techniques - Advantages and Disadvantages
  - Relying on measured depth plus TVD logs
  - Common procedural issues
- Pitfalls in Directional Data
  - Telemetry problems; MWD-LWD log curves; surverys - positional uncertainty
- Inter-Disciplinary Culture/Communications
  - Priorities of geologists/engineers/well site team; finding common ground
- Best Practices at Each Stage, from a Practical Standpoint
  - Pre-drill phase, drilling curve, lateral drilling, post-TD: leveraging new data effectively

INTEGRATED DEEPWATER DEPOSITIONAL AND PETROLEUM SYSTEMS

Instructor: Bradford E. Prather
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, petroleum engineers, supervisors, managers, and technical support staff who are interested in learning the fundamentals of deepwater (turbidite) petroleum systems for application to frontier exploration.

Course Description:
The play based exploration approach is extensively used in the oil industry and relies on developing a thorough understanding of the evolution of key sedimentary sequences through time using Gross Depositional Environment (GDE) Maps. This course provides the knowledge needed to make GDE maps of deepwater stratigraphy and their use in making Common Risk Segment (CRS) maps, leading eventually to the development of a final Yet-to-Find (YTF) analysis of a deepwater play segment. The course is designed around a well-established industry approach (play based exploration). Exercise objectives are to identify and assess a portfolio of prospects from an existing deepwater play.

Learning Outcomes:
- Hands-on experience building and using gross depositional environments (GDE) maps to assign risks to a portfolio of prospects.
- Understand the methodologies for construction of Common Risk Segment (CRS) maps.
- Experience assembling a portfolio of deepwater prospects.
- Gain an appreciation of the factors that control the distribution or reservoir, seal and source rocks
- Learn how to risk a prospect inventory
- Risk reservoir, seal, charge and structure of an individual prospect.

Course Content:
- Seismic resolution of deepwater depositional stratigraphy
- Basic slope depositional processe
- Classification of gross depositional environments
- Deepwater Gross Depositional Environment (GDE) mapping
- Techniques for the classification and mapping of seismic facies
- Slope sediment partitioning
- Construction of CRS maps of reservoir, seal and source rock.
- Identification of a portfolio of prospect/leads
- Identification of the "flagship" prospect
- Assignment risks, volumetric inputs and distribution types
- Generation of a probabilistic volume distribution for "flagship" prospect
- Assessment of play scale reservoir, source, seal and structure risks

MAPPING & INTERPRETING CLASTIC RESERVOIRS

Instructor: Bob Shoup
Discipline: Geoscience
Length: 4 or 5 Days
CEUs: 4.0
Availability: Private
Format: In-Person

Who should attend:
E&P professionals involved in the prediction or delineation of clastic reservoirs. Professionals early in their career, experienced professionals new to working with clastic reservoirs.

Course Description:
Ability to predict reservoir presence/map net reservoir in clastic depositional systems is dependent on understanding depositional geometries of depositional systems and variation of patterns within those systems. Processes associated with sediment delivery/sediment dispersal is a fundamental control on architectural geometry of depositional system. Processes associated with interplay between sediment input/accommodation space are fundamental controls on lateral/vertical stacking patterns. Geometry of depositional systems is similar regardless of depositional location/scale. Patterns within geometries are similar/predictable. Whether the reservoir being studied was deposited on land or on a submarine fan, the geometry of deposition is similar. Interpreters should become familiar with the geometries of clastic depositional systems and patterns that occur within those geometries.

Modern/outcrop analogs are used along with subsurface examples to provide interpreters with an understanding of reservoir distribution and the quality of clastic depositional systems. The exercises are deigned to provide a strong working knowledge of depositional settings, how to recognize them from well logs, and how to map them. Day 5, optional, is a core workshop.

Learning Outcomes:
- Understand basics of correlating well logs in clastic sequences utilizing shale/resistivity markers, interval thickness, sequence. stacking patterns, cross-sections
- Review fundamental controls that influence clastic depositional systems.
- Understanding of lateral/vertical reservoir distribution, reservoir characteristics, connectivity of braided, meandering, anastomosing, entrenched river systems, alluvial fans, deltas, submarine fan systems.
- Improved ability to construct accurate sand percent maps for reservoir prediction, net sand/net pay isochore maps for accurate reservoir characterization.
- Learn to read core, interpret depositional environment.

Course Content:
- Day 1: Interpreting Clastic Reservoir Systems
- Day 2: Architectural Geometrics of Clastic Reservoir Systems
- Day 3: Architectural Geometries of Clastic Reservoir Systems
- Day 4: (Optional) Final Exercise
- Day 5: (Optional) Core Workshop

Participant Testimonials:
"After taking this class, our geoscientists gained a new appreciation of the thinking process that needs to take place before making a map. Computers have made mapping a quicker and much less painful job but unfortunately making these requires no geological skill which then puts into question the real value of the map generated. Is this a good map (geologically reasonable) or a bad map (no obvious geological thinking used). Going back to the basics of the geology and placing the data into the context of a depositional system will ensure that the most geologically real maps are constructed whether they are created by hand or by computer." - Tim K.

MAPPING SEISMIC DATA WORKSHOP

Instructor: Alan Cherry
Discipline: Geoscience
Length: 3 Days
CEUs: 2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Entry to intermediate level geologists/ geophysicists with basic experience interpreting seismic data.

Course Description:
This course is for new interpreters of 2-D/3-D seismic data. This class covers hands-on interpretation of seismic data and construction of various maps from interpreted data. Participants conduct interpretation of 2-D seismic lines, and integrate well log fault and formation tops to seismic interpretation.

The project is a lease block in an extensional tectonic basin with normal growth faults, non-growth faults and hanging wall anticlines. The complex geology in the project area challenges participants in interpretation of geological/ geophysical data.

Participants learn mapping by hand, using interpretation skills and knowledge, which can be applied to mapping on a workstation. They generate and integrate fault and horizon maps. They integrate horizon(s) with faults, position fault polygons, understand and map fault vertical separation, and generate structure maps in faulted areas.

Learning Outcomes:
- Gain knowledge of data for hands-on interpretation.
- Learn to tie well log data to seismic sections.
- Understand correlation of synthetics with seismic data to establish geologic horizons.
- Interpret and mark faults and horizons on seismic lines.
- Generate time and depth structure maps from seismic data.
- Generate fault surface maps and integrate fault maps with horizon data to generate integrated structure maps.

Course Content:
- Geologic background of area
- Pick and mark a major fault on all seismic lines
- Loop tie fault and horizon picks
- Pick points along fault surface on seismic lines
- Tie synthetic trace to seismic reflections and mark horizons
- Pick a horizon, starting with a line close to a well. Continue to pick intersecting lines, and tie picked horizons
- Interpret and correlate a specific horizon and jump correlate across main fault wherever necessary
- Generate a fault surface map in time
- Post fault cut data from wells on a base map
- Convert time fault surface map to depth using time map as a guide, well control and TD chart
- Contour a horizon in time
- Contour horizon in depth
- Review your picks, conversions, contouring, and make any necessary changes to your interpretation and maps
- Integrate fault and structure maps in depth and define upthrown and downthrown fault traces
- Make a short presentation on your interpretation, maps and overall project

PRINCIPLES OF MAPPING WITH PETREL©

Instructor: Laurie Green, MSc, PG
Discipline: Geoscience
Length: 4 Days
CEUs: 3.2
Availability: Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, and reservoir engineers who want to integrate sound mapping practices into their workstation interpretation workflow.

Prerequisite:
Attendees should have prior exposure to subsurface mapping interpretation skills and practices, and a basic knowledge of Petrel© software applications and user interfaces. This course is ideally suited for those who have previously attended SCA's *Applied Subsurface Geological Mapping* course.

Course Description:
This course provides participants with the knowledge and techniques needed to make more accurate and geologically correct maps through: 1) proper data management, 2) integration of fundamental geologic mapping principles with Petrel© mapping software tools, and 3) establishing an iterative process for ensuring consistency between the maps and data. The course bridges the gap between the "tried and true" geologic principles taught in traditional pencil and paper mapping courses, and the advanced computational tools available from the workstation interpretation platform.

This course covers Petrel's© mapping workflows and the geologic principles behind those workflows. Emphasis will be placed on generating geologically valid maps of faulted surfaces, and the inclusion of horizontal well data in unconventional plays. Exercises will include procedures for selecting appropriate gridding algorithms, creating control contours and verifying results.

The instructor and participants will perform various workflows presented in the course, offering an interactive exploration and dynamic visualization of the data in different structural settings. Participants will manipulate data to solidify their understanding of the principles being taught and will leave the course with the ability to apply core knowledge to projects on their own Petrel© workstations.

PLEASE NOTE: PETREL© GEOLOGY AND GEOPHYSICS CORE LICENSES (2015 OR LATER) ARE REQUIRED.

Learning Outcomes:
Provide a basic understanding of:
- Subsurface geologic mapping methods as implemented in Petrel©.
- Petrel's© mapping workflow.
- Data selection and quality control.
- Gridding simple and faulted surfaces with well and seismic data.
- Creating consistent surfaces with horizontal well data.
- Grid modification and quality control.
- Single and multi-surface operations (Grid math).
- Mapping well properties (e.g., porosity).
- Quick-look volumetrics and introduction to uncertainty.
- Other map types – bubble maps, log signatures, curvature.
- Automating the workflow.
- Creating effective presentations with standardized templates.
- Documenting procedures and results.

PROJECT MANAGEMENT FOR EXPLORATION AND DEVELOPMENT PROJECTS NEW

Instructor: Bob Shoup
Discipline: Geoscience, Engineering
Length: 2 Days
CEUs: 1.6
Availability: Public & Private
Format: In-Person

Who Should Attend:
Any member of a multidisciplinary team (geologists, geophysicists, engineers, landmen, technologists, etc.), or anyone involved with managing multidisciplinary team projects including team leaders, project managers, and advisors.

Course Description:
The success of many projects falls squarely on the shoulders of the team leader or project manager. Good project management is a must if your exploration, development, acquisition or divestiture projects are to be completed on time, within budget, and result in success. This course teaches the A to Z of managing, organizing, and implementing a successful project plan. Learn why certain projects succeed while others fail. What are your project drivers – time, budget, and/or performance? The answer to this question will impact the success of your project.

Course Content:
- What is project management?
- Fundamentals of planning, organization, and documentation
- Defining desired results
- Organizing the project and team
- Analysis tasks
- Project management models: Critical Path Methods (CPM) and Gantt
- Dynamics of project management: Plan versus Planning
- Project and physical plant organization
- Project management exercise

"I have witnessed how education opens doors, and I know that when sound instruction takes place, students experience the joys of newfound knowledge and the ability to excel."
Daniel Akaka

FEATURED INSTRUCTOR:

Robert 'Bob' Shoup

Bob Shoup is the Chief Geologist for SCA and the Director for Clastic Reservoir Systems. He is a Board Certified Petroleum Geologist with over 40 years of experience in basin analysis, regional studies, new play generation, and prospect evaluation. Bob began his career at Shell Oil in 1980. His 19 years with Shell were followed by four years working for private oil companies before becoming an independent consultant in 2003. A recognized expert in clastic depositional environments, rift basins, and syndepositional structural systems, Bob is a proven oil finder with a 46% exploration commercial success rate and over 135 MMBOE discovered resources.

Bob is an active contributor in the professional community, currently serving as the AAPG Vice President – Regions. He is a past Chair of the House of Delegates for AAPG, Past President of AAPG's Division of Professional Affairs (DPA), and past Secretary-Editor of the AAPG House of Delegates. He has served on numerous AAPG Committees and was Chairman of AAPG's Mentor, Membership and Student Chapter Committees. He is a recipient of AAPG's and, the DPA's Distinguished Service Award and was granted Honorary Life Membership in the DPA. He is a past President of Bangkok's Chapter of the South East Asia Petroleum Exploration Society and is a lifetime member of the South East Asia Petroleum Exploration Society, the Indonesian Petroleum Association, and the Malaysian Geological Society.

Courses Taught:
- Applied Subsurface Geological Mapping
- Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop
- Effective Petroleum Systems Analysis
- Geology-Based Topical Contouring Workshops
- Mapping & Interpreting Clastic Reservoirs
- Project Management for Exploration and Development Projects
- Quality Assurance/Quality Control Skills for Subsurface Mapping (QAQC)
- QC Techniques for Reviewing Prospects & Acquisitions
- Resource Assessment and Risk and Uncertainty Management

QUALITY ASSURANCE/ QUALITY CONTROL SKILLS IN SUBSURFACE MAPPING (QAQC)

Instructor: Bob Shoup **or** Jim Brenneke
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Private
Format: In-Person

Who Should Attend:
Prospect generators, exploration and development geoscientists, property and prospect evaluators, supervisors, managers and anyone involved in preparing, reviewing or evaluating subsurface interpretations, maps, exploration or development prospects, producing fields and reserves or resources.

Course Description:
This program is designed to provide the participants with a number of mapping techniques before venturing into Quality Control Techniques for Subsurface Maps. It does not replace SCA's five (5) day mapping class but does provide the key mapping fundamentals necessary for the quality control and verification of subsurface maps. The exercise section (actual global exploration, development and production projects) is divided into three (3) parts. The Projects are reviewed immediately after the participants have completed each segment of about five (5) projects per day. New example projects are added to provide customization by client request.

Learning Outcomes:
- Develop an understanding of how to evaluate a variety of subsurface maps including fault, structure, and isochore maps.
- Understand the types of questions to ask when reviewing interpretations, maps, and prospects.
- Evaluate the 3-D viability of an interpretation, map, or prospect.
- Evaluate whether the resources or reserves attributed to completed interpretation or map are under or over-estimated.
- Determine whether an interpreter has applied sound, industry-accepted, geoscience principles and methods to generate an interpretation, map, or prospect.

Course Content:
- Philosophical Doctrine for Subsurface Interpretation and Maps
- General Introduction to Quality Control Techniques of Subsurface maps
- Contouring Techniques
- Log Correlation Techniques
- Fault Interpretation Mapping
- General Cross Section Construction
- Structure Maps
- Isochore Mapping

Participant Testimonials:
"Bob did a great job. He is very knowledgeable and did an excellent job of explaining concepts and their applicability." - Jonathan R.

"I enjoyed the course, learned a lot, and noticed many things that I needed to develop in my own understanding. Would recommend this course to anyone, regardless of experience!" - Ollie M.

"Great course. Really valuable information which helped fill a huge gap in my subsurface mapping knowledge." - Steve T.

QUALITY CONTROL TECHNIQUES FOR REVIEWING PROSPECTS AND ACQUISITIONS

Instructor: Bob Shoup
Discipline: Geoscience
Length: 3 Days
CEUs: 2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Prospect generators, property and prospect evaluators, supervisors, managers, bankers, investors and anyone involved in preparing, reviewing, or evaluating subsurface interpretations, prospects, fields and reserves or resources.

Course Description:
Do you want to avoid drilling dry holes? Do you want accurate reserve assessments? Almost all maps generated in a workstation are wrong, sometime significantly so. Reserves estimated from those maps are inaccurate. Prospects drilled on those maps are often dry holes.

This course addresses the need for a systematic approach for quickly screening interpretations, maps, and prospects to ensure that the potential resources or reserves estimated from those maps are accurately assessed. Through a combination of lecture and exercises, students will learn how to review maps and interpretations with the aim of identifying fundamental interpretation, mapping and estimating errors.

The most common errors found on subsurface interpretations and maps are illustrated with numerous examples from around the world. The course begins with a review of examples of interpretation and mapping errors that led to poorly located wells that were uneconomic or dry, as well as inaccurate reserves or resource estimates. Attendees will learn a number of Quick Look Techniques they can use to identify critical interpretation or mapping errors that cause dry holes or inaccurate resource and reserve estimates. Attendees will then apply these Quick Look Techniques to review actual maps and interpretations. The course manual is our textbook Quick Look Techniques for Prospect Evaluation.

Learning Outcomes:
- Learn how to quickly audit a map for accuracy and validity.
- Evaluate the three-dimensional viability of an interpretation or map.
- Evaluate whether the resources or reserves attributed to a completed interpretation or map are under or over estimated.
- Determine whether an interpreter has applied sound, industry accepted geoscience principles and methods to generate a map.

Course Content:
- Quality Assurance/Quality Control overview with examples
- Philosophical doctrine of subsurface interpretation and mapping
- Dry hole analysis

RESERVOIR CHARACTERIZATION FOR MUDROCK RESERVOIRS

Instructor: Stephen A. Sonnenberg, PhD
Discipline: Geoscience, Engineering, Unconventional Reservoirs
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, & engineers who are interested in exploring and developing resources in mudrock formations. The course is intended to be an overview of various successful and unsuccessful mudrock systems.

Course Description:
This course is an introduction to mudrock resource plays. A wide range of topics will be covered to familiarize the participant with the important nuances of both successful and unsuccessful mudrock plays. The petroleum system approach will be used. A key emphasis of this course will be to show the important elements and processes for continuous oil and gas accumulations. The participant will learn screening techniques (check list) which may help identify continuous types of accumulations.

Learning Outcomes:
- What exactly is a mudrock?
- Understand factors related to tight oil & gas mudrock production.
- Working model for unconventional tight petroleum systems.
- Recognize technologies available for tight reservoirs.
- Determine if a pervasive hydrocarbon exists.
- Determine the type of source rocks present and maturity.
- Use geological and geochemical reconnaissance.
- Mudstone facies.
- Reservoir characterization for mudrock reservoirs.
- Mudrock sequence stratigraphy.
- Understand the importance of mechanical stratigraphy.
- Identify matrix porosity and permeability.
- Identify reservoir drive mechanisms.
- Discuss various tools and techniques for reservoir characterization.
- Discuss structural styles associated with mudrocks (e.g., polygonal fault systems).
- Identify the presence of natural fractures.
- Discuss secondary and tertiary recovery potential in mudrock systems.
- Discuss latest drilling and completion techniques.

Course Content:
Successful mudrock plays discussed in this course include Bakken (Williston Basin), Niobrara (Rocky Mountain Region), Vaca Muerta (Neuquén Basin), Eagle Ford (Gulf Coast), Haynesville (Gulf Coast), Greenhorn (Denver Basin), Marcellus (Appalachian Basin).

RESERVOIR CHARACTERIZATION OF CLASTIC (SANDSTONE) RESERVOIRS

Instructor: Lesli J Wood, PhD
Discipline: Geoscience
Length: 5 Days (Classroom), 10 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists new to reservoir characterization, who want to broaden experiences beyond exploration; petroleum engineers who want to improve understanding of geologic aspects of oil/gas reservoirs. Managers who want a firmer understanding of roles that each team member plays in exploration/development process.

Course Description:
Reservoir characterization is an integrated process of understanding physical nature of clastic reservoirs, how to bring that knowledge to an earth model. This course examines types of clastic reservoirs within context of regional influences, controls on nature. Emphasis is placed on variety of styles, causes of compartmentalization of reservoirs, associated development/production issues. We focus on how to recognize/define compartmentalization in various types of data, to predict problem prior to development using an understanding of contextual stratigraphic framework. We discuss importance/recognition of key bounding surfaces, processes associated with deposition leading to complexity in reservoir architecture. Reservoir types discussed include fluvial, deltaic, paralic, shelf/off-the-shelf slope, deeper water systems. Topics in the course include importance/process of building a stratigraphic framework, interpretation of clastic reservoirs in logs, core, outcrop, seismic, seismic geomorphology of clastic reservoirs, using quantitative analogs, integrated earth models, modelling process, bias in risking, decision making. Case studies are used to explain various topics. In-class exercises are completed to demonstrate principles/techniques.

Learning Outcomes:
- Participants gain a working knowledge of reservoirs common to fluvial, paralic, shelfal, deltaic, deepwater settings, how they distribute themselves in a regional stratigraphic framework.
- Participants will learn to map clastic depositional systems in subsurface, how to integrate those data in reservoir models.
- Participants will gain knowledge in recognizing criteria which differentiate clastic reservoir types.
- Participants will learn scales and types of heterogeneities that characterize clastic reservoirs, and understand influence that heterogeneities exert on reservoir performance.
- Participants will understand bias/risk, how to account for issues in assessment/modeling.

Course Content:
- Geologist, geophysicist, engineer roles
- High-frequency sequence stratigraphy
- Source-to-sink clastic systems
- Clastic reservoir dimensions, architecture
- Modelling clastic reservoirs
- Calculating geo-body dimensions
- Recognition of facies, facies associations
- Porosity/permeability of clastic elements
- Flow units, upscaling, shale architecture
- Influence of structure on gravity deposition
- Practical exercises in clastic systems
- Cognitive bias in risk, assessment

RESOURCE ASSESSMENT AND RISK AND UNCERTAINTY MANAGEMENT NEW

Instructor: Bob Shoup
Discipline: Geoscience
Length: 1 Day
CEUs: 0.8
Availability: Public
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, reservoir engineers, and team leaders involved with assessing and booking reserves and resources.

Course Description:
This class will review the Petroleum Resource Management System (PRMS) and the guidelines for reporting reserves and resources and will present a number of industry best-practices for assessing those reserves and resources.

This one day class provides an overview of portfolio management, reserve and resource reporting and methods and best practices for assessing and risking those reserves and resources.

Learning Outcomes:
- Learn the Petroleum Resource Management System (PRMS) for reporting and booking reserves and resources.
- Understand the fundamentals of Portfolio Management.
- Learn the difference risk and uncertainty in estimating reserves and resources, and how to evaluate both.

Course Content:
- Morning Agenda
  - Introduction
  - Portfolio Management
  - Resource and Reserve Reporting Ethics
  - PRMS

- Afternoon Agenda
  - OGIP and STOOIP
  - Uncertainty vs Risk
  - Quantifying Uncertainty, the Rose Method
  - Quantifying Risk

"You can teach a student a lesson for a day but, if you can teach him to learn by creating curiosity, he will continue the learning process as long as he lives."
Clay P. Bedford

ROCK PHYSICS, WELL LOGS, AND WELL TIE FOR SEISMIC EXPLORATION AND PRODUCTION NEW

Instructor: Ali Tura, PhD
Discipline: Geoscience, Formation Evaluation
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
All exploration and production subsurface staff and managers.

Course Description:
Understanding the properties of rocks is fundamental for a subsurface professional. This topic is covered step by step in clear detail based on the instructor's practical industry experience over many field data applications. The course gives participants an understanding of how the rock frame, the fluids, and pore pressure impact the seismic response. The course also covers how to use wells logs and conduct well ties for seismic calibration and interpretation. Going from rock physics, to well logs, to well tie completes the fundamental knowledge needed to understand, interpret, and analyze seismic data and is key to drilling successful wells. This is a practical course covering theory, practical learnings, key pitfalls, overview of key papers, and practical exercises.

Learning Outcomes:
- Understand how rock physics is applied in the exploration and production of hydrocarbons, including reservoir characterization and monitoring.
- Learn how to use rock physics principles to interpret seismic data and create subsurface models.
- Evaluate fluid and pressure changes on rocks when analyzing seismic data.
- Understand key well logs and how to use them in seismic interpretation.
- Understand why and how to conduct a well tie to seismic data.
- Develop familiarity with pitfalls associated with rock physics and well data.
- Improve the ability to communicate findings and interpretations effectively between subsurface disciplines and with management.

Course Content:
Day 1: Rock Physics Frame
- Exploration & production fundamentals, seismic waves and AVO parameters, rock frame bounds, rock frame mixing laws, granular rock and packings, case studies/ exercise 1

Day 2: Rock Physics Fluids
- Fluid effects on rock, Gassmann fluid substitution, advanced fluid substitution, empirical velocity-porosity-density relationships, rock physics spreadsheet/case studies/exercise 2

Day 3: Rock Physics and Advanced Topics
- Stress on rocks, static/dynamic moduli, pore pressure on rocks, layering and anisotropy, cracks on rocks and anisotropy, gas and attenuation, case studies/exercise 3

Day 4: Well Logs & Seismic
- Types and properties of well logs, caliper & gamma ray logs, density, porosity, resistivity logs, sonic logs, anisotropy & stress, static & dynamic model building, case studies/ exercise 4

Day 5: Well Tie & Seismic
- Formation tops & check shots from wells, seismic wavelet & 1D synthetics, seismic well tie workflow, pitfalls and case studies, summary of course

SEAL AND RESERVOIR PRESSURES ANALYSIS FOR E&P PROSPECT'S RISK ASSESSMENT

Instructor: Selim Shaker, PhD
Discipline: Geoscience, Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Prospect generator geoscientists, geologists, geophysicists, drilling and reservoir engineers, well log analysts, managers, and support staff involved in exploration, development and drilling. This course is exceptionally helpful for explorationists that are keen on appraising prospects in-house and farm in/out.

Course Description:
The optimum trap is a reservoir capable of confining and economically delivering hydrocarbon under a competent sealed cap and /or un-breached faulted structural closure. Sealing integrity is essential for trapping, migration, and lateral and vertical distribution of hydrocarbons in a prospective reservoir. The sealing capacity also impacts reservoir flow rate and the driving mechanism of the initial natural flow and the secondary recovery process. Subsurface geopressure compartmentalization plays a critical role in determining seals, reservoirs and consequently the reserve's volume and flow duration.

This course will demonstrate to participants how to use measured pressure data from wire-line tests (MDTs, RFTs etc.) and production tests to design pressure-depth plots which reveal permeability barriers (sealed), communications, and breached reservoir (seal failure).

It will also examine how seismic velocities and well logs' petrophysical properties establish seal integrity via subsurface pressure drift. Moreover, participants will gain the fundamental knowledge of predicting pore-fracture pressure and estimate the drilling tolerance window (DTW) that leads to successful drilling prognosis of the trajectory bore-hole to the targeted reservoirs formation. Exploration risk in salt basins will be thoroughly discussed with multiple case histories.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS (WITH MS OFFICE SUITE INSTALLED).

Learning Outcomes:
- Understand the causes, concepts and graphic representations of vertical and horizontal compartmentalization due to reservoirs partitioned by seals.
- Comprehend pressure gradient in seals versus reservoirs and the causes of disparity between measured and predicted values.
- Recognize sealed vs. breached reservoirs.
- Calculate hydrocarbon columns in four ways vs. three way faulted closures.
- Evaluate and assess the trapping risk of a prospect before and post drilling.

Course Content:
- Subsurface Compartmentalization
- Reservoirs
- Seals
  - Cap Seals (four ways)
  - Fault Seals (faulted three ways)
  - Salt - Sediments Interface
- Prospect Evaluation
  - Pre drilling
  - While drilling
  - Post drilling

WE PRACTICE WHAT WE TEACH

Our instructors are experts in their fields and still actively engaged in their areas of specialization.

Many of our instructors have served as consultants on various SCA projects as contracted by major oil and gas companies domestically and internationally.

SEISMIC GEOMORPHOLOGY NEW

Instructor: Lesli J Wood, PhD
Discipline: Geoscience
Length: 3 Days (Classroom), 3 Five-Hour Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, engineers, geophysicists, and managers who evaluate technical work.

Course Description:
Seismic geomorphology is the study of landforms imaged in 3D seismic data for the purpose of understanding the history, processes and fill architecture of a basin. This course will review both qualitative and quantitative approaches to interpreting and applying seismic geomorphologic observations in basin exploration and reservoir development and in carbon sequestration. Examples from Gulf of Mexico, Indonesia, Trinidad, Morocco, Australia, New Zealand and other basins of the world will be used to illustrate the techniques for interpreting the depositional elements of fluvial, deltaic, shoreline, shelf, and deep water clastic and carbo-clastic systems. These examples will also be used to delineate geohazards and to quantify and use those data to predict reservoir and seal distribution and architecture, body geometries, plan field developments and assess uncertainty.

We will examine a variety of depositional systems and integrate seismic, logs, core and other data into a comprehensive geomorphologic analysis of each system. Assigned reading will be provided. Exercises will give participants the chance to learn techniques in sketch mapping, measuring and calculating flow behaviors from morphometry, extrapolating 2D observations into 3D knowledge, as well as the relationship between morphometry, process and deposits.

Learning Outcomes:
- Techniques in mapping geomorphology in seismic data.
- Techniques in seismic data interrogation to maximize the imaging of a basin's geomorphic elements.
- Knowledge of the seismic expression of, and an ability to recognize in planform and cross-section, the various elements of depositional systems.
- Recognition of impact of various elements on fluid flow in the basin.
- Process for interpreting, documenting, calculating process and quantifying implications of data assessment for decision making.

Course Content:
Day 1:
- What is Seismic Geomorphology? Techniques and Take-Aways
- SG of Fluvial Systems;
- Deltas and Shelf Edges
- The Shelf is a Dangerous Place

Day 2:
- Slope and Toe of Slope Processes and Deposits
- Deepwater Processes and Deposits
- Canyons and Valleys
- Review Exercise and Discuss Guyana/ Suriname; Channel Complexes

Day 3:
- Review Gabon Mapping Exercise
- Lobes (Frontal and Lateral)
- Mass Failure Processes and Properties
- Mass Failures in E, P and CS
- Deserts of the Deep: Deepwater Continuous Current Systems
- SG in Geotechnical Assessment Work
- Let's Talk About CO_2 Sequestration Assessments

SEQUENCE STRATIGRAPHY APPLIED TO OIL AND GAS EXPLORATION

Instructor: Oscar Lopez-Gamundi, PhD
Discipline: Geoscience
Length: 5 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists and engineers in exploration and production.

Course Description:
This five-day course covers the concepts and practical applications of sequence stratigraphy for oil and gas exploration, appraisal and production. All concepts are illustrated with examples of seismic, well-log, core, and outcrop data. The exercises emphasize the recognition of termination patterns, sequence stratigraphic surfaces and systems tracts on seismic lines, well logs and outcrops. The ultimate objective of the course is to provide the practitioner with tools and methodologies of sequence stratigraphy to effectively predict the presence and quality of reservoir, source rock and seal and define the key architectural elements of stratigraphic traps.

Learning Outcomes:
- Learn to identify in well logs and seismic the different types of sequences and systems tracts.
- Identify the basic concepts of seismic facies and log-based facies for the definition of systems tracts and sequences.
- Understand the utility of systems tracts in terrestrial, transitional and marine depositional environments for the recognition and reservoir, source, and seal predictions.

Course Content:
- Fundamental Concepts
- Methodology for Sequence Stratigraphic Analysis
- Internal Architecture of Sequences (System Tracts)
- Sequence Stratigraphy in Carbonate Environments
- Controls on carbonate sedimentation
- Carbonate slopes and platforms in seismic. Seismic Facies.
- Sequence-stratigraphic models of carbonate platforms
- Sequence Stratigraphy and Growth Strata

Participant Testimonials:
"Very good instructor! He fielded questions well and had great time management - super informative class." - Joy B.

"Dr. Lopez-Gamundi has a great combination of teaching skills and good humor, and he really challenged us." - Lauren S.

"Extremely knowledgeable in the subject and related topics; he paid attention to our abilities and needs." - Brent V.

"Excellent instructor with a great attitude combined with a strong knowledge of the subject matter." - Jade T.

STRUCTURAL GEOLOGY & TECTONICS AS APPLIED TO UPSTREAM PROBLEMS

Instructor: James Granath, PhD
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Private
Format: In-Person

Who Should Attend:
Exploration and production geologists

Course Description:
A unique training program in which clients can design a customized, three to five-day training course comprised of half day, critical skill modules (see below) coupled with hands on consulting/mentoring. Blended learning techniques will be integrated through a variety of teaching styles and materials such as PowerPoint presentations, handouts, videos and online activities. The content of each module reflects science or expertise related to an oil and gas workflow, topic, or problem, especially integration of geological and seismic data into a valid and reasonable structural interpretation.

Onsite Consulting Service Option:
Each training module can be further expanded with individualized consulting/mentoring by subject-matter experts to further enhance the learning experience. These consulting services can address the client's own data and specific challenges.

Sample 5-Day Course Content:
Day 1:
- Introduction: Compressional HC traps
- Deformation mechanisms and mechanical stratigraphy
- Mechanics of faulting and fracturing

Day 2:
- Folding and fault-fold relationships
- Basement-involved compressional block uplifts

Day 3:
- Thin-skinned fold and thrust belts
- Inversion tectonics

Day 4:
- Restoration and cross section balancing
- Advanced restoration techniques

Day 5:
- Consultation/Mentoring: Special problems: hands-on restoration workflow with client's data sets

Optional Modules available below for customized in-house training. Design your custom training course with guidance from SCA. All modules are half-day and are designed for exploration and production geoscientists at any career level.

- Applied Rock Deformation Concepts
- Deformation Mechanisms/Mechanical Stratigraphy
- Mechanics of Faulting and Fracturing
- Folding and Fault/Fold Relationships
- Natural fractures and fracture modeling
- Geomechanics
- Physics of sealing and sealing faults
- Fundamentals of salt and shale tectonics
- Restoration and cross section balancing
- Advanced restoration techniques
- Structural styles and HC traps overview
- Structure of continental rifts
- Rifting to passive margin: hyperextension
- Thin-skinned extensional structural geology
- Basement-involved compressional block uplifts
- Thin-skinned fold and thrust belts
- Fundamentals of strike-slip tectonics
- Inversion tectonics
- Epi-cratonic basins and foreland basins

STRUCTURAL STYLES IN PETROLEUM EXPLORATION AND PRODUCTION

Instructor: Lansing Taylor, PhD
Discipline: Geoscience
Length: 4 Days (Classroom), 8 Half-Day Sessions (Live Online)
CEUs: 3.2
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Exploration and production geologists, geophysicists and engineers who need to develop knowledge in a broad range of global structural styles; understand the structural geometry of trap-forming structures and to apply structural techniques to make improved seismic interpretations, balanced cross sections and structural maps in complex areas.

Course Description:
Structural geology is often the fundamental key to successful interpretation and prospecting. This course provides a strong fundamental background in structural geology of the various tectonic settings. It covers common structural styles in sedimentary basins worldwide and the geometry and evolution of trap-forming structures associated with compressional, extensional, salt, strike-slip and reactivated structures. Techniques for constructing balanced cross sections, maps and 3-D interpretations through these structures are discussed in detail. Examples of trap-forming structures from a number of basins worldwide are used to illustrate the concepts. Problem sets provide hands-on experience in interpreting and validating subsurface structures using surface, seismic and well log data.

Learning Outcomes:
- Understand structural styles of trap-forming structures in different tectonic provinces.
- Study the kinematic evolution of compressive, extensional, diapiric, strike-slip and reactive structures.
- Interpret subsurface structure using seismic, surface and well data.
- Construct structure maps of common trap-forming structural styles.
- Review structural geometry of major fields from different provinces and use them as analogs for structural interpretation of exploration prospects and newly discovered fields.

Course Content:
- Introduction to comparative structural styles
- Methods of cross section and map construction
- Fold-thrust structures Foreland basement structures
- Rift structures
- Listric growth faults
- Salt structures
- Inversion and reactivated structures
- Strike-slip structures
- Validation of 2D and 3D interpretations and common pitfalls

Participant Testimonials:
"Lans was exceptional. I feel I could ask any question and he had the answer in detail. He was enthusiastic and fun, and exceeded my expectations for what could be put into one week of class." - Carly M.

"I learned so much from this course - very brilliant professor." - Paula C.

"Very excellent instructor! Extremely effective in getting as much material as possible into a small amount of time while still teaching effectively. His energy also helped to keep us engaged and excited about the content." - Randy B.

THE PRACTICE OF SEISMIC STRATIGRAPHY IN DEEPWATER SETTINGS

Instructor: Bradford E. Prather
Discipline: Geoscience
Length: 3 Days
CEUs: 2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, petroleum engineers, supervisors, managers, and technical support staff who are interested in learning the fundamentals of deepwater (turbidite) depositional systems for application to development and exploration.

Course Description:
Play-based exploration as used in the oil industry relies on developing a thorough understanding of the evolution of key sedimentary sequences through time in the form of Gross Depositional Environment (GDE) maps. This course provides techniques for making GDE maps of deepwater stratigraphy, and the language concepts required to articulate a basin-to-prospect-scale, deepwater depositional model needed for the quantification of prospect risk and uncertainty. The course integrates slope depositional process understanding with sequence stratigraphy, and seismic facies analysis used in the construction of GDE maps.

Learning Outcomes:
- Understand the role GDE maps play in frontier exploration.
- Achieve a general understanding of deepwater depositional models.
- Learn how to classify slope systems
- Practice classification and mapping of seismic facies, interpreting environments of deposition, and developing depositional models.
- Apply sequence stratigraphic concepts in an analysis of deepwater systems.
- Strengthen confidence in using depositional models to assemble appropriate analogs to benchmark distributions used as part of play and prospect evaluation processes.

Course Content:
- Products expected of an industry seismic stratigrapher
- Basics of gravity flows and sediment transport
- Dynamics of basin subsidence and sediment flux
- Seismic resolution of deepwater depositional stratigraphy
- Classification of slope systems
- Techniques for the classification and mapping of seismic facies
- Regional depositional processes of continental slopes
- Classification of gross depositional environments
- Controls on reservoir distribution and architecture in submarine valley, leveed-channel complexes and submarine aprons
- Application of sequence stratigraphy concepts to deepwater systems
- Partitioning of sediment across slopes

Participant Testimonials:
"Phenomenal instructor. Brings a lot of valuable real-world experience. Very hands-on. He sought lots of input from the class too." - Jeff K.

"Very knowledgeable and effective at communicating the material and answering any questions." - Matthew H.

TIME-LAPSE AND MULTI-COMPONENT SEISMIC NEW

Instructor: Ali Tura, PhD
Discipline: Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
All exploration and production subsurface staff and managers.

Prerequisite:
Recommended to take the "Rock Physics, Well Logs, and Well Tie for Seismic Exploration and Production" course first.

Course Description:
This course covers time-lapse (4-D) seismic and multi-component (MC) seismic theory and applications. The ability to monitor reservoirs and take appropriate development decisions with 4-D seismic data is key. This requires understanding of complex seismic acquisition, processing, and analysis methods. Further, node technology and elastic full-waveform inversion (FWI) imaging is advancing the advantages of multi-component seismic data in the industry.

This course shows how to optimally use 4-D and MC data (from theory to practical applications) to improve successful asset management and reduce risk. It also allows geoscientists to better communicate with engineers and the engineers to understand usage and pitfalls of 4-D and MC seismic methods. The instructor is one of the most experienced people in the industry in this area with substantial field project execution experience.

Learning Outcomes:
- Ability to evaluate if a reservoir is appropriate for time-lapse and multi-component seismic applications.
- Become familiar with the impact of acquisition and processing on 4-D seismic.
- Understand how saturation and pressure changes impact seismic amplitudes and AVO (amplitude variation with offset).
- Develop familiarity with advanced 4-D applications to unconventional projects.
- Understand the value of MC seismic for exploration and production projects.
- Become familiar with the impact of acquisition and processing on MC seismic.
- Understand pitfalls of 4-D and MC methods.
- Enhance seismic data knowledge to drill better exploration and production wells.
- Improve communication skills between subsurface disciplines and management.

Course Content:
Day 1: Time-Lapse (4-D) Acquisition
- Time-lapse value, 4-D offshore acquisition, 4-D onshore acquisition, time-lapse repeatability, case studies/exercise 1

Day 2: Time-Lapse (4-D) Processing
- Key processing steps, 4-D binning, offshore processing, onshore processing, cross-equalization, case studies/exercise 2

Day 3: Time-Lapse (4-D) Analysis
- Rock physics basis, 4-D modeling, fluid saturation & pressure changes, 4-D time-shifts, advanced applications, 4-D feasibility & project evaluation, 4-D spreadsheet/ discussion & in-house projects

Day 4: Multi-Component (4C) Acquisition & Processing
- Seismic wave modes, value of 4C seismic, 4C acquisition onshore & offshore, 4C processing onshore & offshore, case studies/ exercise 4

Day 5: Multi-Component (MC) Analysis
- 4C inversion, S-impedance from 4C, anisotropy from 4C, time-lapse amplitude

FEATURED INSTRUCTOR:

Alan Cherry

Alan Cherry is a Senior Geoscientist with over 35 years of industry experience. He has been associated with SCA since 2005 as one of the company's principal geoscience consultants. His integrated skill set includes 2D and 3D geophysical interpretation, exploration play analysis and prospect generation, field development, reservoir engineering, formation evaluation, economic assessment, reserves evaluation, drilling, completion, and production operations. He is highly proficient in the use of multiple geologic and seismic interpretation tools.

His areas of expertise include Offshore Gulf of Mexico, Texas Gulf Coast, South Louisiana, East Texas, Permian, Uinta – Piceance, Williston, North Slope, Cook Inlet, and onshore California. Internationally, he has worked projects in Ukraine, Russia, Indonesia, North Sea, Senegal, Nigeria, Gabon, Tanzania, Morocco, Somalia, Iran, Qatar, Thailand, South China Sea, Ecuador, Venezuela, Argentina, and Colombia.

Alan received his BS in Geology at State University of New York and did his graduate studies at the University of Houston and Wright State University. He is a Licensed Professional Geologist in Texas and a Certified Professional Geologist in Indiana.

Courses Taught:
- Mapping Seismic Data Workshop
- Well Tie Workshop

WELL TIE WORKSHOP

Instructor: Alan Cherry
Discipline: Geoscience
Length: 2 Days
CEUs: 1.6
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geologists, geophysicists, and senior-level geotechnicians who want to learn good practices for proper integration of seismic and well data using IHS Kingdom software.

Prerequisite:
Attendees should have prior experience using Kingdom Geophysics/Geology software.

Course Description:
This course provides participants an opportunity to learn how to properly tie well data to seismic data. The course will deal with techniques using seismic in the Time domain; however, issues associated with mis-ties that occur with Depth domain seismic will be addressed too. Kingdom has multiple workflows for integrating well and seismic data and each of these will be addressed in detail. Potential "pitfalls" using Kingdom's built-in well tie workflows will be identified.

Learning Outcomes:
- Quality-check of tops and "quality" assignment.
- Vertical displays and data input and readout in measured depth (MD), true vertical depth (TVD) seismic, and subsea (SS) depth.
- One-way vs two-way time.
- Generating time depth charts from tops and horizon pairs for both individual wells and interpreted horizons and many wells.
- Inputting and editing check shot data with potential pitfalls.
- Curve fitting of check shot data.
- Assignment of "shared" TD charts, regional and vertical variability – Are selected shared TD charts "valid"?
- Converting sonic DT to interval and average velocity.
- Integrated sonic logs, generation and their use and potential pitfalls.
- Identification of seismic phase and potential effects of hydrocarbons on phase.
- Velocity anomalies such as fault and gas sag.
- QC and editing of log curves (spike removal and/or filtering) to be input into synthetics.
- Synthetics from sonic and density logs.
- Use of other "substitute" logs in place of sonic and density and or creation of "synthetics".
- Extracted and "created" wavelets use and pitfalls.
- Stretching a squeezing of synthetic to seismic and associated benefits and pitfalls.
- Identification of mis-ties prior to mapping (saving yourself a lot of grief).

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS (WITH KINGDOM AND MS EXCEL INSTALLED).

Course Content:
- Effects (issues) of setting the Seismic Reference Datum (SRD) for both time and depth domain seismic data.
- Inputting tops and setting the "quality" attribute to tops.
- Manual input of check shots.
- Fit well picks to Interpreted seismic (TD pairs without check shots).
- Generate artificial check shots from TD pairs.
- Curve fit TD pairs and check shot data for QC and use as shared check shots.
- Sonic logs, density logs
- Synthetic creation, stretching synthetics

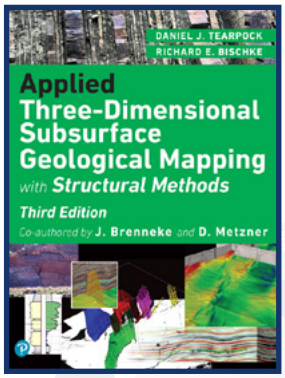
GEOSCIENCE COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE							INSTRUCTOR
Applied Biostratigraphy in Oil and Gas Exploration and Production	✓						Krebs
Applied Contouring Methods Workshop	✓						Agah
Applied Deep-Water Sedimentology & Stratigraphy	✓						Rotzien
Applied Seismic Interpretation Workshop	✓						Willis
Applied Subsurface Geological Mapping	✓						Agah or Brenneke or Shoup
AVO, Inversion and Attributes: Principles and Applications	✓						Willis
Carbonate Sedimentology and Sequence Stratigraphy	✓						Lopez-Gamundi
Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop	✓						Shoup & Olson
Effective Petroleum Systems Analysis	✓						Shoup
Elements of Energy Geology: Basin Analysis & Subsurface Energy Storage	✓			✓		✓	Sonnenberg
Elements of Petroleum Geology	✓					✓	Sonnenberg
Geology-Based Topical Contouring Workshops	✓						Shoup
Geosteering: Best Practices, Pitfalls, & Applied Solutions	✓		✓				Woolsey
Integrated Deepwater Depositional and Petroleum Systems	✓						Prather
Mapping & Interpreting Clastic Reservoirs	✓						Shoup
Mapping Seismic Data Workshop	✓						Cherry
Principles of Mapping with Petrel©	✓						Green
Project Management for Exploration and Development Projects	✓	✓					Shoup
Quality Assurance/Quality Control Skills in Subsurface Mapping (QAQC)	✓						Shoup or Brenneke
Quality Control Techniques for Reviewing Prospects & Acquisitions	✓						Shoup
Reservoir Characterization for Mudrock Reservoirs	✓	✓	✓				Sonnenberg
Reservoir Characterization of Clastic (Sandstone) Reservoirs	✓						Wood
Resource Assessment and Risk and Uncertainty Management	✓						Shoup
Rock Physics, Well Logs and Well Tie for Seismic Exploration & Production	✓				✓		Tura
Seal & Reservoir Pressures Analysis for E&P Prospects Risk Assessment	✓	✓					Shaker
Seismic Geomorphology	✓						Wood
Sequence Stratigraphy Applied to O&G Exploration	✓						Lopez-Gamundi
Structural Geology & Tectonics As Applied To Upstream Problems	✓						Granath
Structural Styles in Petroleum Exploration and Production	✓						Taylor
The Practice of Seismic Stratigraphy in Deepwater Settings	✓						Prather
Time-Lapse and Multi-Component Seismic	✓						Tura
Well Tie Workshop	✓						Cherry

Geoscience	Engineering	Unconventional	Energy Transition	Formation Eval	Multi-Disciplinary

APPLIED SUBSURFACE GEOLOGICAL MAPPING

From the newly graduated geoscientist or engineer to the seasoned professional, this course covers both fundamental and advanced methods of subsurface mapping.



Developed and authored by SCA's Founder, Daniel J. Tearpock, our flagship course and associated textbook provide students with critical skills that are essential to successful oil finding. Students will receive the **Applied Three-Dimensional Subsurface Geological Mapping with Structural Methods 3rd Edition (2020)** textbook and a lab manual with exercises.

This course provides the applied, hands-on knowledge required to generate sound subsurface geologic maps which are the most important and widely used documents in petroleum exploration and development. Geoscientists and engineers are expected to understand and be able to efficiently and accurately generate many types of subsurface maps. Nevertheless, many geoscientists have not had sufficient formal training in the fundamental principles and methods that underlie accurately constructed subsurface maps, whether the data source is a seismic interpretation, well log correlation, or both.

Instructors:


Sia Agah


Jim Brenneke


Bob Shoup

Learning Outcomes:

- Understand different hand contouring methods and pitfalls of selected computer contouring methods.
- Capable of integrating fault data from well logs and seismic data.
- Generate fault surface interpretations and maps.
- Understand the construction and application of various types of cross sections.
- Generate net pay isochore maps for both bottom and edge water reservoirs.

Course Content:

- Philosophical doctrine, workflow and methodology of mapping and contouring techniques.
- Applications of directionally drilled wells and directional surveys to mapping.
- Log correlation techniques for vertical and deviated wells (applications to mapping).
- Structure mapping and cross section construction in extensional, compressional, strike-slip, and diapiric tectonic settings.
- Fault surface mapping using well log and seismic.
- Integrate geophysical data in subsurface mapping.
- Isochore map construction (bottom water and edge water reservoirs).
- Net sand and pay correction factors for directionally drilled wells.
- Structure vs. porosity top mapping.
- Walking wells.
- Fault wedge mapping.
- Pitfalls of computer-generated maps.
- Volumetric calculations.

To purchase a copy of this renowned textbook, visit **scacompanies.com/resources/publications** or contact SCA's Training Department at (713)789-2444 or **training@scacompanies.com**.

PRINCIPLES OF MAPPING WITH PETREL©

About the Instructor:

Principles of Mapping with Petrel© was designed by SCA Senior Geologist and Training Instructor, Laurie Green. Laurie has extensive international and domestic experience as a geophysical interpreter, geomodeler and project manager in conventional and unconventional assets for both E&P and service companies. Laurie has broad expertise in computer-based mapping and modeling systems as an interpreter, programmer and technical trainer. She has performed integrated field studies for global clients using different software systems and understands how computer-generated maps can be used and mis-used in real-world projects. Laurie received her BSc in Geological Sciences from Cornell University and her MSc from the University of California at Santa Cruz. She is a registered Professional Geoscientist in the state of Texas.

Who Should Attend:

Geologists, geophysicists, and reservoir engineers who want to integrate sound mapping practices into their workstation interpretation workflow.

Prerequisite:

Attendees should have prior exposure to subsurface mapping interpretation skills and practices, and a basic knowledge of Petrel© software applications and user interfaces. This course is ideally suited for those who have previously attended SCA's *Applied Subsurface Geological Mapping* course.

Learning Outcomes:

- Subsurface geologic mapping methods as implemented in Petrel©
- Petrel's© mapping workflow
- Data selection and quality control
- Gridding simple and faulted surfaces with well and seismic data
- Creating consistent surfaces with horizontal well data
- Grid modification and quality control
- Single and multi-surface operations (Grid math)
- Mapping well properties (e.g., porosity)
- Quick-look volumetrics and introduction to uncertainty
- Other map types – bubble maps, log signatures, curvature
- Automating the workflow
- Creating effective presentations with standardized templates
- Documenting procedures and results

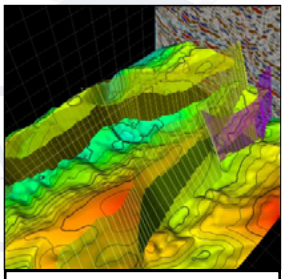
Description:

This course provides participants with the knowledge and techniques needed to make more accurate and geologically correct maps through:

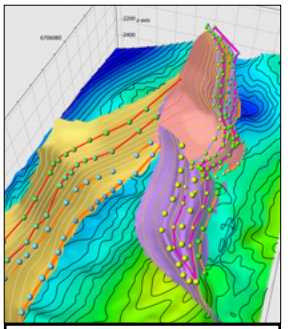
1) proper data management
2) integration of fundamental geologic mapping principles with Petrel© mapping software tools
3) establishing an iterative process for ensuring consistency between the maps and data

The course bridges the gap between the "tried and true" geologic principles taught in traditional pencil and paper mapping courses, and the advanced computational tools available from the workstation interpretation platform.

Participants will learn Petrel's© mapping workflows and the geologic principles behind those workflows. Emphasis is placed on generating geologically valid maps of faulted surfaces and the inclusion of horizontal well data in unconventional plays. Exercises include procedures for selecting appropriate gridding algorithms, creating control contours and verifying results. The instructor and participants will perform various workflows presented in the course, offering an interactive exploration and dynamic visualization of the data in different structural settings. Participants will manipulate data to solidify their understanding of the principles being taught and will leave the course with the ability to apply core knowledge to projects on their own Petrel© workstations.



Fault connectivity patterns defined

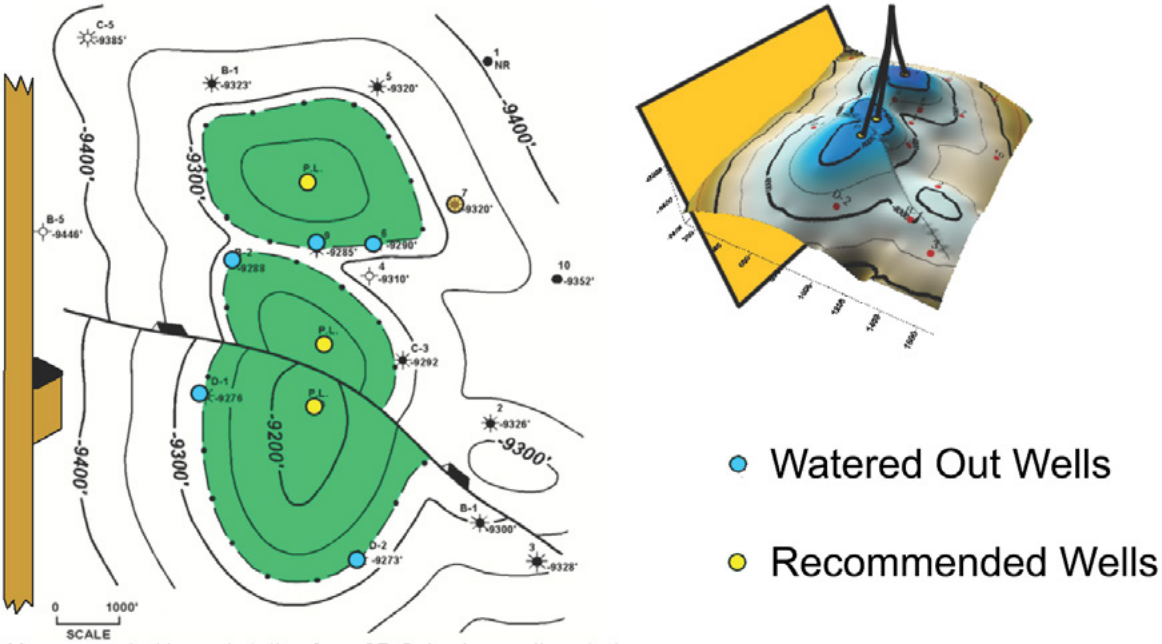


Surface gridded with fault polygons

QC TECHNIQUES FOR REVIEWING PROSPECTS & ACQUISITIONS

Avoid Dry Holes and Accurately Assess Reserves

Exercise: Would you approve these wells?



Map generated in workstation from 3D Seismic + well control

Several wells have watered out on this growth fault rollover structure. Three wells have been recommended to drain the attic reserves.

If you approve them, you just approved two dry holes!
Do you know why? If not, you need this class.

Quality Control Techniques for Auditing Maps

- Was the data loaded and used properly?
- Does the map honor the data?
- Do the contours exhibit contour compatibility?
- Do the contours honor vertical separation?
- Are the fault traces properly positioned?
- Does the map match the seismic?
- Does the map honor the geology?

Private sessions may be scheduled according to instructor availability.
Contact SCA's Training Department at (713)789-2444 or **training@scacompanies.com**.

The Daniel J. Tearpock Geoscience Certification Program
("Geoscience Boot Camp")

"How do we jump-start a new hire into a contributing geoscientist to help find and develop new resources and reserves of oil and gas?"

The answer is SCA's "Daniel J. Tearpock Geoscience Certification Program", more commonly known as "Geoscience Boot Camp." This intensive 12-week training program includes six weeks of classroom courses taught by SCA's top instructors followed by a six-week interpretation and mapping project.

Participants learn fundamental interpretation, engineering, and mapping skills, and then put those skills to the test using seismic data, well logs, and production information from an actual development prospect. During the project phase, SCA engages a team of senior-level geoscientists to serve as mentors to the participants and help guide their interpretation and decision-making process. The program is designed to raise the competency level and knowledge of the participants in a short period of time.

Since its debut in 2008, our Geoscience Boot Camp has trained numerous participants from around the world. Many of our students are employees of national oil companies that are seconded to major US-based oil and gas companies. Our clients have found this program to be exceptionally valuable in meeting training obligations for foreign nationals.

The main objective of the program is to advance the skill level of participants to make them contributing members of a company's exploration or development program in a minimum period of time. The combination of in-class training, mentoring, and hands-on application through a real-world project provides the participants with well-rounded knowledge of geoscience and engineering best practices.

Who should register?

Our program is recommended for early career geoscientists and engineers who will benefit from a timely and cost-effective means of learning and applying geology, geophysics, and engineering fundamentals. Although not required, the program is designed for participants with at least a Bachelor's degree in geology, geophysics, engineering or some other related science field.

2024 Public Dates

Held at SCA's Houston Training Center

September 16 - December 6, 2024

(A private boot camp may be scheduled subject to instructor availability)

12-Week Schedule Overview

Six-Week Classroom Phase:

- Basics of the Petroleum Industry
- Elements of Energy Geology: Basin Analysis & Subsurface Energy Storage
- Basic Petroleum Economics
- Basic Petroleum Engineering for Non-Engineers
- Applied Contouring Methods Workshop
- Practical Interpretation of Open Hole Logs
- Structural Styles in Petroleum Exploration and Production
- Structural & Sequence Stratigraphy Field Course
- Applied Subsurface Geological Mapping
- Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop
- Modern Depositional Systems as Analogs for Subsurface Characterization
- Applied Seismic Interpretation
- Mapping Seismic Data Workshop

Six-Week Project Phase:

This intensive six-week project provides hands-on application of material learned during the classroom phase. Participants will develop a strong foundation in geological and geophysical interpretation and mapping, as well as an understanding of the application of reservoir engineering, log analysis, risk analysis, and probabilistic and deterministic resources estimation.

For more information, contact
Mary Atchison, VP of Training Operations at
training@scacompanies.com
or (713)789-2444.

Testimonials from Former Students

Ahmed, Bahrain Petroleum Company

"All of the tasks done were very relevant and invaluable in adding the experience and skills that I didn't have. The myriad of skills and experience gained through the hands-on training during the project phase are directly relevant to the exploration work I am expected to do (lead/prospect generation and evaluation, seismic interpretation, time/depth map generation, etc.) Doing everything manually on paper have given me a better appreciation of the work one does at the workstation. Taking this course have greatly improved my understanding of the fundamental workflow and techniques required for such tasks."

Chris, New Orleans, LA

"The experience is something that I will always remember! It helped me grow as a geoscientist and I already feel the impact of what I have learned. Each instructor really took their job seriously and wanted to help us grow and it really showed. We were always busy with something and the project really reinforced the first 6 weeks… This certification program was extremely helpful and informative. I highly suggest any one associated with oil and gas complete it, as it covers many aspects of the industry. Well worth my time and investment and already see the benefits of the knowledge I've gained."

Ahmed, BAPCO

"The course in its entirety, for someone who has just started working in the industry, is an excellent addition after university. The myriad skills and experience gained through the hand's on training during the project phase are directly relevant to the exploration work I am expected to do (Lead/prospect generation and evaluation, Seismic Interpretation, Time/Depth map generation etc). Doing everything manually on paper has given me a better appreciation of the work one does at the workstation. Taking this course has greatly improved my understanding of the fundamental workflow and techniques required for such tasks."

Carly, Juneau Exploration

"This program far exceeded my expectations. I have been in Academia for too long because I expected it to be slower paced, less efficient, and definitely less application-oriented. I was thrilled when I found that everything I learned could be applied directly at work. I actually do feel like a functioning and competent geoscientist at the moment, where I truly was not before the program as I only had 2 months experience in the industry. I expect to use ALL of the skills we applied in the project phase. I think I do now possess the knowledge and technical skills to contribute competently to my company's future endeavors."

APPLIED DRILLING ENGINEERING OPTIMIZATION FOR DRILLING ENGINEERS

Instructor: Robello Samuel, PhD
Discipline: Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Drilling engineers, well operations personnel, who would like to gain greater understanding of mud motor design and their applications in drilling.

Course Description:
Topics will include techniques of optimization, basic concepts, different optimization methods, hydraulic optimization, different nozzle selection criteria, diamond and roller cone bit weight on bit, rotary speed drilling optimization, hydraulic optimization with special downhole tools, well cost estimation, minimum cost casing design. This course envisages studying algorithms and optimization techniques used in the various stages of drilling and well completion operations. The course will also focus on presenting different optimization methods and expose the participants to variety of problems and solve them successfully. The training price includes *Applied Drilling Engineering Optimization* (400 pages, color) authored by Dr. Robello Samuel.

Course Outline:
- Optimization of the following:
  - Well Planning (Key factor)
  - Drilling Rig (Major factor)
  - Wellpath
  - Drilling Fluid
  - Hydraulic
  - Drilling Parameters
  - Shale Stabilization
  - Real-time
  - Well Cost
  - Wellbore Size
  - Flat Time

"The purpose of learning is growth, and our minds, unlike our bodies, can continue growing as we continue to live."
Mortimer Adler

APPLIED DRILLSTRING MECHANICS FOR DRILLING ENGINEERS

Instructor: Robello Samuel, PhD
Discipline: Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Drilling engineers, well operations personnel, rig supervisors, drilling supervisors, and pipe manufacturers who would like to gain greater understanding of mud motor design and their applications in drilling.

Course Description:
The course provides a comprehensive treatment of drill string design, practices with theoretical underpinnings. Various operational loads and limits discussed will provide more comprehensive view of the drillstring mechanics. It also covers advanced drilling engineering, enabling participants to understand the drillstring integrity under various operating load conditions. The class also covers the BHA design concepts, drillahead and drillstring dynamics. Participants will be provided on the realtime time monitoring and optimization and predictive conditions when the well is drilled. Upon completion of this course, participants will not only have deeper knowledge of the basic engineering principles used in the drillstring design but also have confidence to use them efficiently for consulting as well as solving complex problems effectively.

Course Outline:
- Basics and mechanical properties and concepts
- Wellbore friction and wellpath challenges
- Downhole tools and placement
- Torque and drag models – soft, stiff, hybrid and dynamic
- Fatigue, buckling, stress and yield limits
- BHA selection
- Basics of vibration and drillstring vibration and challenges
- Drillstring dynamics
- Tubular wear
- Failure prevention

ARTIFICIAL LIFT AND PRODUCTION OPTIMIZATION SOLUTIONS

Instructor: Rajan N. Chokshi, PhD
Discipline: Engineering, Unconventional Reservoirs
Length: 5 Days
CEUs: 4.0
Availability: Public & Private
Format: In-Person

Who Should Attend:
Production/Reservoir/Completion/ Drilling/ Facilities engineers, field operators, working in integrated project teams. Anyone interested in selection, design, analysis, optimum operation of artificial lift and related production systems. Project /asset managers interested in the effects of artificial lift on the performance of their assets.

Course Description:
Cost savings and efficiency improvement require existing and planned oil and gas production assets are optimally utilized. Most oil and gas wells require artificial lift for most of their productive life; the artificial lift systems are important part of production operations for the entire lifecycle of an asset. Careful selection, design and operation of artificial lift equipment is important for profitability. Efficient and cost-effective production workflows involve field management using digital oilfield concepts. Understanding of these production concepts are key to profitably exploit the existing assets fully.

The objective of this course is to:
- Provide awareness of production fundamentals by introducing fluid flow, flow correlations, PVT/Black Oil, IPR, VLP, nodal analysis, pressure gradient curves.
- Introduce applications of major forms of artificial lift like GL, RRL, ESP, PCP, HJP, plunger, capillary injection.
- Provide knowledge about the lift system, from downhole to surface - for GL, RRL, ESP, PCP, HJP, and Plunger.
- Discuss challenges facing lift applications.
- Explore downhole monitoring and surface measurements.
- Efficient and cost-effective production workflows involve field management using digital oilfield concepts. Understanding of these important production concepts are key to profitably exploit the existing assets to the fullest extent.

Learning Outcomes:
- Artificial lift techniques for production optimization.
- The basics and advanced concepts for each form of artificial lift systems from downhole to the surface including real-time optimization equipment and software.
- Using appropriate software tools, how lift components are designed and analyzed.
- Challenges facing lift applications.
- Artificial lift selection and life cycle
- Recent advances in real-time approaches to the production monitoring and lift management from field case studies

Course Content:
Day 1: Systems Analysis and Gas-Lift
Day 2: Reciprocating Rod Lift
Day 3: Electrical Submersible Pumping (ESP)
Day 4: PCP, Hydraulic Lift, Gas Well De-liquification
Day 5: Capillary, Plunger Lift, Digital Oil Field

Note:
This course is customizable from one to five-days in length.

ARTIFICIAL NEURAL SYSTEMS IN PETROLEUM ENGINEERING NEW

Instructor: Robert F. Shelley, PE
Discipline: Engineering
Length: 2 Days
CEUs: 1.6
Availability: Public & Private
Format: In-Person

Who Should Attend:
Anyone who is frustrated with the limitations or inconvenience of physics-based models. Predictive Artificial Neural Network Models (ANN) developed from data provide quick answers, offer a fresh perspective, test physics-based modeling assumptions and can quantify the impact of geology, chemistry, operations and other factors on well production and recovery.

Course Description:
Participants will learn the fundamentals and develop a working knowledge of ANN modeling technology through the course's hands-on model building exercises. An ANN is a form of Artificial Intelligence (AI) that can develop a relationship between known outputs and a desired outcome. ANN modeling case histories will be studied to help participants understand why this approach was used and provide examples in which significant cost savings and value has been created. These examples include predicting well production, recovery, completion design, hydraulic fracturing, reservoir classification and prospect evaluation. Additionally, participants will obtain a working knowledge about building models from data and be able to identify potential applications for ANN modeling technology.

All students will be required to have a laptop (with admin rights) with Windows and Excel installed. As a learning aid, a demo version of ANN model development software will be installed during class. This course does not include a software license for students.

Although this is not a programming course, a proficiency with Excel is recommended.

Learning Outcomes:
- Identify potential applications and for the ANN modeling approach.
- Basic understanding of ANN modeling concepts.
- Hands on exposure with ANN model development.
- Model development strategies to address specific needs or problems.
- Techniques to mitigate real world uncertainty.
- Strategies to minimize the impact of data issues such as quantity, quality, completeness and consistency.

Course Content:
DAY 1:
- Modeling Background
- Concept and Theory
- Data Issues and Preprocessing
- Predictive Model Development
  - Feed Forward Neural Network
- Self-Organizing Mapping
  - Model Training
  - Strategies and Application
  - Case Histories
- Modeling Experiments
  - Data Quantity
  - Use of Testing Data
  - Predictor Evaluation and Model Selection

DAY 2:
Model Development Exercises
- Predicting Well Production, Granite Wash
- Completion Design Evaluation, Marcellus
- Evaluate Reservoir Proxy Data, Bakken
- Predicting Sand-outs, Mission Canyon
- Reservoir Classification, Wolfcamp B

CEMENT REPAIR WORKSHOP

Instructor: William K. Ott, PhD
Discipline: Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Drilling and completion engineers, field supervisors, petroleum engineers and geologists, company executives and officials, independent producers, field personnel with operating & service companies, and production managers and engineers.

Course Description:
This one-day training course introduces methods of detecting fluid channels, voids, and leaks, and focus on their effective repair. Poor cement coverage often produces undesired fluids, disposal problems, reservoir pressure decline, loss of hydrocarbon reserves, and other problems. Intend to evaluate and discuss various technologies used to repair leak paths due to wellbore aging which can develop allowing fluid to migrate from the higher-pressure downhole strata through leakage paths in the cement containment.

Topics on the technologies available to repair the primary cement to the proper stage of hydraulic isolation or solve the SCP and SCVF problem will be discussed at the Training Course. Half the morning of the Training Course is dedicated to cement evaluation and the afternoon to cement repair.

Course Content:
- Cement and Isolation
- Acoustic Bond Logs – What They Measure
  - Types of Acoustic Bond Logs
- Cement Bond LOG (CBL) Tool Configuration and Operations
- Tool Configuration
- Squeeze Cementing
- Problem Diagnosis
- Squeeze Cementing Theory
- Squeeze Methods
- Placement Techniques
- Tools and Job Considerations
- Well Preparation
- Job Planning
- Slurry Design and Preparation
  - Fluid Loss
  - Pumping/Working Time
  - Compressive Strength and WOC (Waiting on Cement)
  - Other Design Parameters
  - Slurry Volume
- Basic Procedures
  - Slurry Mixing
  - Slurry Placement
  - Displacing
  - Squeezing Pressures
  - Cleanup
  - Wait on Cement (WOC)
- Applications
- Alternatives to Cement
- Specialty Products and Techniques
- Evaluating a Squeeze Cementing Job
- Reasons for Failures
- Conclusions
- Summary of Recommended Practices

DATA ANALYTICS WORKFLOWS FOR ARTIFICIAL LIFT, PRODUCTION, AND FACILITY ENGINEERS NEW

Instructor: Rajan N. Chokshi, PhD
Discipline: Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
This Intermediate level course is primarily intended for artificial lift, production and facilities engineers and students to enhance their knowledge base, increase technology awareness, and improve the facility with different data analysis techniques applied on large data sets. Reservoir engineers and data scientists have also benefitted from this class.

Prerequisites for the course are summarized below:
- Understanding of petroleum production concepts.
- Knowledge of Python is NOT A MUST but preferred to get more benefit.
- We will use the Google Collaboratory environment available in Google-Cloud for hands-on exercises.
- Trainees will need to bring a computer with a Google Chrome browser and a Google email account (available for free).

Course Description:
Data analysis means cleaning, inspecting, transforming, and modeling data with the goal of discovering new, useful information and supporting decision-making. In this hands-on course, the participants learn some data analysis and data science techniques and workflows applied to petroleum production (specifically artificial lift) while reviewing code and practicing. The focus is on developing data-driven models while keeping our feet closer to the underlying oil and gas production principles. Specifically, the following use cases are discussed covering their business impact, code walk-throughs, and solutions:

- Gas-Lift Optimization: Single point gas-lift injection for gas wells in tight formation using simulated data.
- Choke flow rate estimation for high-volume wells using offshore dataset.
- Rod Pump Diagnosis (card classification) using onshore field data.
- Multiphase Flow Meter Prediction using three-phase measured dataset.

Customization
- The course content is for one-day classroom or two virtual half-day sessions. The training can be presented as a 2-days or four half-day long virtual sessions with expanded content.
- Client's dataset-based examples are optionally incorporated in the class discussions. This option requires discussions with the client about the problem, two-days of consulting effort, and access to the client dataset at least 4 weeks before the class.

Learning Outcome:
- Participants will have a set of tools and some pathways to model and analyze their data in the cloud, find trends, and develop data-driven models.

Course Content:
- Digital Oil Field Data Explorations/Workflows; A Brief/Incomplete Primer on Machine Learning/Artificial Intelligance (ML/AI); System Setup & Checks; Data Workflows & Best Practices in Data Exploratory Analysis; Choke Flow Rate Study; Rod Pump Dynamometer Card Classification; Multiphase Flow Meter

DEVELOPING ROBUST PRODUCTION FORECASTS: DO'S AND DON'TS

Instructor: Srini Prasad
Discipline: Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Reservoir engineers, production engineers, subsurface managers, and asset managers.

Course Description:
Developing and sustaining a production delivery track record of meeting or exceeding expectations is a critical component of ensuring that an upstream oil/gas company is properly valued by the industry and the investment community. Success depends upon creating the right production forecast (and range) and then delivering the promise. Developing robust production targets is critical for planning and making sound business decisions. This class identifies the key issues associated with setting the right production expectations and provides recommendations to improve forecast reliability.

Learning Outcomes:
- Key factors in developing a production forecast.
- How to account for uncertainties in the forecast.
- Factors impacting short-term and long-term forecasts.
- Recommendations for different field/reservoir types/production maturity.
- Checklist of Do's and Don'ts.

Course Content:
- Why is it Important?
- Production Forecasting Phases?
- Production Forecasting Approach
  - Capacity Model & Downtime
  - Estimating Reservoir and Well Potential
  - Estimating Downtime
  - Injection Issue
  - Commercial Considerations
  - Long-Term and Short-Term Forecasts
  - Common Pitfalls
- How to Account for Uncertainty
  - Types of Uncertainty
  - Uncertainty and Error
  - Train Wreck and Force Majeure
  - Uncertainty Analysis at Asset/Field & Portfolio Levels
- Quality Assurance
  - Independent "Cold Eyes" Review
  - Benchmarking
  - Audit Trail
- Recommendations for Different Field/ Reservoir Types
  - Conventional Oil Reservoirs: Greenfield and Brownfield
  - Unconventional Oil Reservoirs: Greenfield and Brownfield
  - Considerations for Gas Reservoirs

FOR SAFE DRILLING: FORMATION - FRACTURE PRESSURE INTERPRETATIONS AND ANALYSIS

NEW

Instructor: Selim Shaker
Discipline: Engineering
Length: 5 Days (Classroom), 10 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
Drilling, completion and reservoir engineers and managers, drilling supervisors and staff, mud loggers, well log and geopressure analysts, geologists, geophysicists and technical staffs.

Course Description:
The geopressure and fracture pressure subsurface profile has great impact on drilling prognosis, challenges and the cost estimate of testing a prospect. Before drilling, pore-fracture pressure prediction is a prerequisite for a successful drilling. The size of the drilling tolerance window (DTW), especially in deepwater and high temperature, high pressure (HTHP) environments, dictates the drilling operation maneuverability, such as mud weight, casing settings and projected total depth.

Most of the pressure surge, hard kicks, blowouts and loss of circulation unexpectedly happens when the drill bit penetrates the interface between seal (e.g. shale) and reservoir (e.g. sand). A comprehensive knowledge of pressure disparity causes between shale and sand is a keystone for safe and economically feasible exploration projects. Overlooking the fortunate presence of a large oil-gas pool can further shrink the drilling tolerance window and allow unexpected drilling challenges.

Water depth, sediment maturation, and the subsurface geological structural setting dictate the size of the safe drilling tolerance window. Estimation of the safe DTW allows drilling with minimum challenges like lost circulation, kicks, excessive torque, bore-hole instability, pack off-hole, etc.

Learning Outcomes:
- Understand the causes, conceptual models and graphic representations.
- Gain the knowledge of the different prediction methods and help choose the right software for your proposed well location.
- Comprehend the importance of PP-FP profile in assigning the casing seats depth, MW and their safety limitations.
- Calibrate (in real time) the before drilling PP-FP model to ensure ECD stay in the safety margins in a stable bore-hole.
- Understand challenges involve drilling through faults, salt ridges and overhangs, salt weld, pay zones and depleted reservoirs.
- Recognize the effect of pore pressure – geomechanics interrelation on bore hole stability, caving, tight holes, etc.
- Assess drilling safety especially in Deepwater such as SWF, narrow DTW, Kicks, LOC, Dual Gradient Drilling (DGD), Managed Pressure Drilling (MPD).
- Appraise the proposed completion operation based on geopressure. compartmentalization.

Course Content:
- Pore Pressure Fundamentals
- Subsurface Pressure Profile Impact on Drilling Prognoses
- Pre-Drilling Prediction and Assessment
- While Drilling PP-FP Pertaining Analyses
- While Drilling Applications
- Post-Drilling
- Drilling Challenges in Deepwater

GAS-LIFT & DELIQUIFICATION APPLICATIONS NEW

Instructor: Rajan N. Chokshi, PhD
Discipline: Engineering, Unconventional Reservoirs
Length: 3 Days (Classroom), 8 Three-Hour Sessions OR 6 Four-Hour Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Production, reservoir, completion, drilling, and facilities engineers, and anyone interested in learning about the implications of gas-lift systems for their fields and reservoirs.

Course Description:
Gas-lift is one of the predominant forms of artificial lift used for lifting liquids from conventional, unconventional, onshore, and offshore assets. Additionally, proper application of gas-lift to loaded-up gas wells can be one of the most effective ways of improving profitability of a gas well portfolio. Gas-lift and its various forms (intermittent lift, gas-assisted plunger lift) enable various well lift possibilities when selected and applied properly. This course is designed to give trainees a thorough understanding of gas-lift technology and related application concepts.

Learning Outcomes:
- Provide a thorough introduction about the theory of gas lift.
- Demonstrate the advantages and limitations of gas-lift systems.
- Acquaint the student with system evaluation, design, installation, operation concepts.

Course Content:
Modules 1 & 2:
- Introduction
  - Artificial Lift: When/Why/What of Lift Mechanisms
  - Similarities and differences of gas-lift compared to other lift forms, market position
- Review of well performance fundamentals
  - Systems/NODAL Analysis
  - Reservoir performance: Productivity Index & Inflow Performance Relationship (IPR)
  - PVT Analysis
  - Multiphase Flow
    - Flow correlations & mechanistic models
    - Flow regimes/maps
    - Pressure gradient curves
    - Vertical Lift Performance (VLP)
- Gas-Lift
  - Types, application, advantages, limitations
  - Downhole and surface equipment
  - Gas-lift production rate and well evaluation basics - Operating Points Analysis

Modules 3 & 4:
- Gas-Lift Valve Mechanisms
  - Classifications: IPO, PPO, Pilot, Dummy
  - Continuous Flow Unloading Sequence
  - Importance of True Valve Performance
- Gas-Lift Installation Designs
  - Overview of IPO design methodology
  - Valve spacing and valve sizing
  - Design and optimization

Modules 5 & 6:
- Gas well deliquification options
- Plunger lift; gas-lift well life cycles
- Gas-assisted plunger lift (GAPL)
- Plunger-assisted gas lift (PAGL)
- Intermittment gas-lift basics and overview of design

Modules 7 & 8:
- Injection infrastructure: compression and sizing
- Well unloading procedures and guidelines
- Gas-lift trouble-shooting and diagnostics
- Digital oilfield and ML introductions as applicable to gas-lift

HOW TO MAXIMIZE THE VALUE OF CONVENTIONAL OIL RESERVOIR DEVELOPMENTS: BEST PRACTICES NEW

Instructor: Srini Prasad
Discipline: Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, reservoir engineers, production engineers, subsurface managers, and asset managers.

Course Description:
The primary objective of any upstream oil reservoir development should be to make the right sanction promise and then meet/beat the promise (recoverable volume, production, cost and schedule estimates).

It is critical to select the right subsurface development, then execute/operate it in a manner to meet the above objective. The subsurface is the foundation of an upstream oil/gas company. The right reservoir rock and fluid characteristics are key to getting the best returns on your investment and sustaining the long-term health of the company. A key financial metric is the cost/barrel. In today's world with the advent of digitalization, Subsurface Excellence, Innovation, Automation, Machine Learning/Artificial Intelligence are key to "increasing the denominator" of the financial metric.

This class provides examples of how to maximize the value of exploiting a conventional reservoir development by applying these principles of subsurface excellence, innovation, and digitalization. It identifies value enhancement levers all the way from the Appraise to the Operate stage of the development.

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Course Content:
- What is the Context and What are the Drivers?
- Typical Exploitation Stages of a Conventional Reservoir Development
  - Expectations for the Appraise(A)/Select(S)/Define(D)/Execute(E)/Operate(O) Stages
- Bolster Performance/Reduce Discovery-Start-Up Time (A-S-D-E Stages)
  - New Appraise and Select Stage Philosophies (Leverage "Agile")
  - Different Development Philosophy
- Do the Right Subsurface Development/Do it Right
  - Utilize Four Subsurface Excellence "Evaluation Lenses"
    - Benchmark Recoverable Volume Per Completion and Recovery Factor Estimates
    - Robust Sanction Case Production/Injection Forecasts and Recoverable Volume Estimates
    - Reservoir Well Surveillance and Management to Deliver the Sanction Promise
    - Recovery Factor Technical Limit Study: Maximize Ultimate Recovery
- Sustain/Enhance Well Health Leveraging Robotic Process Automation Based Well Surveillance (O Stage)
- Track/Enhance Water Injection Delivery Performance (O Stage)
  - Razor-Sharp Focus on Water Injection Delivery
  - Machine Learning: Enhance Performance After Acquiring Enough Data to Train the Algorithm
  - Increasing Recovery with Low Salinity Water and New Chemical Cocktails
- Addressing Cultural/Organizational Issues

IN-WELL FIBER-OPTIC SENSING NEW

Instructor: Dennis Dria, PhD
Discipline: Engineering, Geoscience
Length: 2 Days
CEUs: 1.6
Availability: Public & Private
Format: In-Person

Who Should Attend:
Completion, drilling, production, surveillance, and reservoir engineers who need an introduction to the design and use of fiber-optic instrumented well installations, as well as geologists and geophysicists who need an understanding of the capabilities of in-well fiber-optic sensing.

Course Description:
This two-day training event introduces petroleum engineers and geoscientists to fiber-optic sensing technology that is used for well and reservoir diagnostics and surveillance.

Learning Outcomes:
- How fiber-optic sensors work.
- Where and how fiber-optic sensing can create value.
- Technical and economic factors that influence the selection and justification for installing DAS/DTS systems in specific well types.
- Completion and monitoring components needed to deliver a DAS/DTS-monitored well.
- Installation and commissioning operations.

Course Content:
In-Well Fiber-Optic Sensing: Introduction to the Technology and Applications (1 Day)
- What is Fiber-Optic Sensing (FOS): basic physics and engineering of the FOS system components: fibers, coatings, cabling, connectors optical fibers, sensor types, instrumentation.
- Why we would want to use FOS: advantages and disadvantages vs. other sensing/monitoring technologies.
- Overview of the different applications
- Survey of FOS system deployment methods
- Data management and analysis/interpretation
- Factors that influence FOS system selection
- High-level screening of candidate wells and justification for installing FOS

In-Well Fiber-Optic Sensing: Applications and Deployment (1 Day)
"Applications for Diagnostics and Surveillance"
- Introduction to "Life-of-Field" monitoring with Fiber-Optic Sensing (FOS)
- Using FOS for completion and stimulation diagnostics
- Life-of-field surveillance
- What FOS provides (where it works), what it misses (advantages/disadvantages vs. other monitoring tools)
- Integration (synergy) with other monitoring methods

"Deployment of Fiber-Optic Sensing Systems: Well Design and Installations"
- Fiber-optic sensing (FOS) well architectures
- FOS system – component selection and specification
- Well design modifications needed to accommodate FOS
- Installation operations
- Commissioning

MANAGING MATURE OILFIELDS WITH CAPACITANCE-RESISTANCE MODELLING

Instructor: Larry Lake, PhD and Jerry Jensen, PhD
Discipline: Engineering, Geoscience
Length: 2 Days (Classroom), 4 Three-Hour Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Engineers and geoscientists with 2 or more years of experience in managing and/or developing mature oil fields. Students should have basic proficiency in Excel and bring their own laptop.

Course Description:
Developing and managing mature oil fields can have many challenges. Ideally, a history-matched reservoir simulation model using a comprehensive reservoir model will guide choices, such as well locations and water injection rates. Many fields, however, lack such tools and need simpler, less sophisticated methods to improve results. This is where the capacitance-resistance model (CRM) can help. The CRM evaluates injector-producer connectivity using injector and producer flow rates and bottom hole pressures (if available). It is a simplified model capturing the effects of injection on production and does not require any geological model to operate. Results can be used to adjust injection rates, identify fluid escape, and compare with geological information. CRM results can also help reservoir simulation model development.

This course provides prospective users with the knowledge to use the CRM and apply its results to manage mature fields. Through numerous field examples, we show how the CRM can be applied and the results interpreted. Both engineers and geoscientists will see how the results can help their challenges.

Learning Outcomes:
- Introduce CRM method.
- Describe CRM versions and their advantages.
- Illustrate CRM capabilities.
- Provide case studies showing applications.

Course Content:
- CRM basics and variations (4 hours)
  - Basic flow equations
  - CRMT + exercise
  - CRMP + spreadsheet demo
  - CRMIJ
  - ICRM
- CRM uncertainty (2 hours)
  - Data sufficiency and CM number
  - CRM parameter sensitivities to noise and well interventions
  - CRM behavior
- Applications 1 (2 hours)
  - Primary recovery
  - Flow capacity curves
  - Tracers and CRM
- CRM modified versions (2 hours)
  - Segmented
  - Compensated
  - Pseudo well
- Applications 2 (4 hours)
  - Segmented
  - Oil production modelling
    - Gentil model
    - Koval model
    - Application to CO_2 flooding
- Percolation basics (2 hours)
  - Percolation - relevance to reservoir behavior
  - Non-linear behavior of connectivity
  - Geological uncertainty and effects on connectivity
- Case studies (4 hours)
  - Comparison to seismic
  - Integration with geology

ENGINEERING

FEATURED INSTRUCTOR:
Larry Lake, PhD

Dr. Larry W. Lake is a professor in the Dept. of Petroleum and Geosystems Engineering at The University of Texas at Austin where he holds the Shahid and Sharon Ullah Chair. He holds BSE and PhD degrees in Chemical Engineering from Arizona State University and Rice University, respectively. Dr. Lake is the author or co-author of more than 100 technical papers, four textbooks and the editor of three bound volumes. He has served on the Board of Directors for the Society of Petroleum Engineers (SPE), won the 1996 Anthony F. Lucas Gold Medal of the AIME, the Degoyer Distinguished Service Award in 2002, and has been a member of the National Academy of Engineers since 1997. He won the SPE/DOE IOR Pioneer Award in 2000.

Course Taught:
- Managing Mature Oilfields with Capacitance-Resistance Modelling

FEATURED INSTRUCTOR:
Jerry Jensen, PhD

Dr. Jerry Jensen is a part-time research engineer at the Bureau of Economic Geology, University of Texas at Austin. From 2007 to 2018, he held the Schulich Chair in Geostatistics at the University of Calgary's Department of Chemical and Petroleum Engineering. Prior to 2007, Jerry held faculty positions at Texas A&M (1998-2007) and Heriot-Watt (1985-1997) Universities and worked as a field engineer for Services Techniques Schlumberger (1973-1977) and Gearhart Industries (1977-1983). Jensen has taught industry short courses on geomechanics, well log interpretation, geological statistics, reservoir characterization, and petrophysics.

Jensen received a BSc in electrical engineering from the U. of Birmingham (UK) in 1973 and a PhD degree in petroleum engineering from the U. of Texas at Austin

Course Taught:
- Managing Mature Oilfields with Capacitance-Resistance Modelling

PRINCIPLES AND PRACTICES OF MUD MOTOR

Instructor: Robello Samuel, PhD
Discipline: Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Drilling engineers, well operations personnel, rig supervisors, drilling supervisors mud motor designers and manufacturers who would like to gain greater understanding of mud motor design and their applications in drilling.

Course Description:
This is a unique and focused training on positive displacement motor commonly called mud motor. Positive displacement motor commonly called Mud motor, a simple but elegant machine that has become an integral part of the BHA specially when drilling shale wells. Even though tremendous advancements have been made but the challenges remain. The one-day training on mud motors covers the concepts, performance, advancements, future designs and how to use and when to use at difficult times. The workshop covers additional talks from industry technology leaders and is targeted for engineers, mud motor experts and manufacturers. The training price includes *Positive Displacement Motor: Theory and Applications* textbook (400 pages, color) authored by Dr. Robello Samuel.

Course Outline:
- Mud Motor History
- History of Power Sections
- Product Variants
- Genesis of Profile
- Evolution and Trends
- Design Problems -- Sensitivity Analysis
- Operational Challenges
- Lab Tests and Downhole Vibration
- Repair and Maintenance
- Limits and Potential New Directions
- Mud Motor: Not a Dying Breed -- From Workhorse to Racehorse
- Mud Motor Hydraulic and Mechanical Optimization (software demo included)

PRMS AND SEC RESERVES AND RESOURCES REGULATIONS

Instructor: W. John Lee, PhD
Discipline: Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, engineers, supervisors, managers, financial analysts, investors, bankers, or anyone who needs to understand the industry standard methods to classify and report reserves and resources.

Course Description:
This course summarizes the "Petroleum Resources Management System (PRMS) - 2018 Update" classification system. PRMS guidelines are compared to SEC reserves reporting rules which, at the option of the audience, are also covered in significant depth. The course also emphasizes guidelines for unconventional (low permeability) resources, which are under-emphasized in the original (2007) PRMS document but have received more detailed coverage in the updated *Canadian Oil & Gas Evaluation Handbook (COGEH)* in a recent section on Reserves Other Than Resources (ROTR).

Learning Outcomes:
- PRMS resources classification system.
- SEC reserves reporting guidelines (optional).
- Deterministic and probabilistic resources estimation procedures.
- PRMS-compliant procedures to unconventional resources.

Course Content:
- Logic, workflow, and methodology of resource evaluations
- Risk and uncertainty in resource assessments
- Guidelines for classification of projects and categorization of recoverable quantities
- Applying guidelines to incremental projects
- Applying guidelines to unconventional resources
- Reporting guidelines: commercial criteria, production measurement issues, resources entitlement and recognition
- Overview of volumetric and production-based resource assessment techniques including pitfalls
- Overview of probabilistic resource assessment techniques
- Comparison of PRMS to SEC reserves reporting regulations (optional)

FEATURED INSTRUCTOR:

Rajan Chokshi, PhD

Dr. Rajan Chokshi works as an artificial lift and production 'Optimizer' for Accutant Solutions. He has over 36 years of experience working with a national oil company, research consortia, consulting and software firms, and a service company in various roles: engineer, software developer, project manager, trainer, consultant, and senior business leader.

Rajan has worked on global projects in multiphase flow, artificial lift, production optimization, data analysis with real-time production monitoring. He has co-authored over fifteen SPE papers and holds two US patents. He has served on the SPE training and global production award committees and several technical committees for the SPE ATCE and artificial lift conferences. He has co-chaired an SPE artificial lift workshop, an SPE forum on production issues in unconventional, and an SPE multiphase flow metering workshop. He was an SPE Distinguished Lecturer twice for the 2015-2016 and 2018-2019 years. Dr. Chokshi holds a Bachelor's and Master's in chemical engineering from the Gujarat University and IIT-Kanpur, India; and a Ph.D. in Petroleum Engineering from the University of Tulsa, USA.

Courses Taught:
- Artificial Lift and Production Optimization Solutions
- Artificial Lift and Real-Time Optimization for Unconventional Assets
- Data Analytics Workflows for Artificial Lift, Production, and Facility Engineers
- Gas-Lift & Deliquification Applications
- Producing Unconventional with Gas Lift - From Annular to PAGL to Plunger Lift and In-Between

PRODUCING UNCONVENTIONAL WITH GAS LIFT - FROM ANNULAR TO PAGL TO PLUNGER LIFT AND IN-BETWEEN

NEW

Instructor: Rajan N. Chokshi, PhD
Discipline: Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Production, reservoir, completion, drilling and facilities engineers, analysts, and operators working in unconventional assets. Anyone interested in learning about lifecycle and implications of gas-lift systems for their unconventional reservoirs.

Course Description:
Gas-lift is one of the predominant forms of artificial lift used for lifting liquids from conventional, unconventional, onshore and offshore assets. Gas-lift and its variations – annular lift, tubular lift, plunger assisted gas lift (PAGL), intermittent lift, gas-assisted plunger lift and chamber lift – allow life of well lift-possibilities when selected and applied properly. In unconventional wells, production phases and volumes vary quickly and significantly that requires non-traditional approach for selection, transition, surveillance and trouble shooting. This course is designed to give trainees thorough understanding of how unconventional production differs and what steps an operator can take to apply right sized and right form of gas lift technique to maximize profitability.

The course covers main components, application envelope, relative strengths and weaknesses of gas-lift and its different forms like intermittent lift, gas-assisted plunger lift. Trainees solve examples and class problems throughout the course. Animations and videos reinforce the concepts under discussion. A unique feature of this course is discussion on digital oil field and machine learning applications in gas-lift optimization.

Learning Outcomes:
- Understand the fundamental theories and procedures related to gas-lift operations.
- Easily recognize the different components of the gas-lift system and their basic structural and operational features.
- Be able to select an appropriate gas-lift configuration for different life stages of an unconventional well.
- Review recent advances in real-time approaches to the production monitoring and lift management.

Course Content:
- Introduction
- Well Performance: Review of Fundamentals
- Gas Lift Installation Types
- Gas Lift Valves
- Continuous Flow Gas Lifting
- Optimization of Continuous Flow Gas Lift Installations
- Gas Lift Application in Unconventional Production
- Analysis and Troubleshooting of Continuous Flow Gas Lift Wells
- Digital Oil Field for Production Optimization
- Brief Discussion on Use Cases for Data Analytics

PRODUCTION FORECASTING FOR LOW PERMEABILITY RESERVOIRS

Instructor: W. John Lee, PhD
Discipline: Engineering, Unconventional Reservoirs
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Engineers, geologists, financial analysts, investors, bankers, or anyone who needs to understand traditional and recent methods to forecast production for low-permeability oil and gas reservoirs.

Course Description:
This course summarizes decline curve analysis (DCA), including Arps' decline models, linear flow models, and other recent decline analysis approaches. We provide background information on basic fluid flow theory, which enhances understanding of strengths and limitations of both traditional and recent decline analysis methods. Numerous short class exercises illustrating principles will be included.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS (WITH MS EXCEL INSTALLED)

Learning Outcomes:
- State assumptions and limitations of Arps and other decline models.
- Analyze production histories and forecast production using Arps and other decline models for low-permeability reservoirs.
- Analyze production histories and forecast production using the Fetkovich type curve.
- Outline systematic forecasting procedures combining rate-transient analysis (RTA), decline curve analysis, numerical and analytical reservoir models.

Course Content:
- Basic fluid flow fundamentals underlying DCA and RTA
- Flow regime identification
- Arps decline model
- Fetkovich and other type curves
- Alternative decline models: stretched exponential, power law, long-duration linear flow, Duong model
- Comparison of decline models
- Systematic procedure for DCA
- Overview of RTA, including systematic work flow for applications Discussion of the current state of the refrac industry

FEATURED INSTRUCTOR:

W. John Lee, PhD

W. John Lee is the Rob L. Adams Professor in Petroleum Engineering at Texas A&M University. John holds BS, MS and PhD degrees in chemical engineering from the Georgia Institute of Technology. He worked for ExxonMobil early in his career and specialized in integrated reservoir studies. He later joined the Petroleum Engineering faculty at Texas A&M, and became Regents Professor of Petroleum Engineering. While at A&M, he also served as a consultant with S.A. Holditch & Associates, where he specialized in reservoir engineering aspects of unconventional gas resources. He joined the University of Houston faculty in September 2011 and held the Cullen Distinguished University Chair until September 2015. He served as an Academic Engineering Fellow with the U.S. Securities & Exchange Commission (SEC) in Washington during 2007-2008, and was a principal architect of the modernized SEC rules for reporting oil and gas reserves.

John is the author of four textbooks published by SPE and has received numerous awards from SPE, including the Lucas Medal (the society's top technical award), the DeGolyer Distinguished Service Medal (the society's top service award) and Honorary Membership (the highest recognition awarded society members). He is a member of the U.S. National Academy of Engineering and the Russian Academy of Natural Sciences.

Courses Taught:
- PRMS and SEC Reserves and Resources Regulations
- Production Forecasting for Low Permeability Reservoirs
- Reserves Estimation

RESERVES ESTIMATION NEW

Instructor: W. John Lee, PhD
Discipline: Engineering, Geoscience
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Reserves analysts, geologists, geophysicists, reservoir engineers, and managers.

Course Description:
This course will introduce commonly used deterministic and probabilistic reserves estimation methods, including analogy, volumetric, material balance, reservoir simulation, and production decline curves. The presentation format will be largely lecturing, including topics for class discussions.

Learning Outcomes:
- Estimate reserves using analogy methods.
- Estimate reserves using volumetric method.
- Estimate reserves using material balance methods.
- Describe applications of reservoir simulation to reserves estimation.
- Estimate reserves using decline curves.
- Estimate reserves using probabilistic methods.

Course Content:
- Overview of Reserves Estimation Methods
- Example Applications of Deterministic Reserves Estimation Procedures
- Overview of Probability Distributions
- Probabilistic Reserves Estimation Procedures
- Capen's Alternatives to Monte Carlo Simulation

ENGINEERING COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE	Geoscience	Engineering	Unconventional	Energy Transition	Formation Eval	Multi-Disciplinary	INSTRUCTOR
Applied Drilling Engineering Optimization for Drilling Engineers		✓					Samuel
Applied Drillstring Mechanics for Drilling Engineers		✓					Samuel
Artificial Lift and Production Optimization Solutions		✓	✓				Chokshi
Artificial Neural Systems in Petroleum Engineering		✓					Shelley
Cement Repair Workshop		✓					Ott
Data Analytics Workflows for Artificial Lift, Production, and Facility Engineers		✓					Chokshi
Developing Robust Production Forecasts: Do's and Don'ts		✓					Prasad
For Safe Drilling: Formation – Fracture Pressure Interpretations and Analysis		✓					Shaker
Gas-Lift & Deliquification Applications		✓	✓				Chokshi
How to Maximize the Value of Conventional Oil Reservoir Developments: Best Practices		✓					Prasad
In-Well Fiber-Optic Sensing	✓	✓					Dria
Managing Mature Oilfields with Capacitance-Resistance Modelling	✓	✓					Lake & Jensen
Principles and Practices of Mud Motor		✓					Samuel
PRMS and SEC Reserves and Resources Regulations		✓					Lee
Producing Unconventional with Gas Lift – From Annular to PAGL to Plunger Lift and In-Between		✓					Chokshi
Production Forecasting For Low Permeability Reservoirs		✓	✓				Lee
Reserves Estimation	✓	✓					Lee

Geoscience | Engineering | Unconventional | Energy Transition | Formation Eval | Multi-Disciplinary

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ARTIFICIAL LIFT AND REAL-TIME OPTIMIZATION FOR UNCONVENTIONAL ASSETS

Instructor: Rajan N. Chokshi, PhD
Discipline: Unconventional Reservoirs, Engineering
Length: 3 Days
CEUs: 2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Reservoir/completion/drilling/facilities/production engineers working on shale development. Field and asset supervisors and managers interested in improving performance of their unconventional assets. Personnel interested in artificial lift and unique challenges of unconventional production.

Course Description:
Unconventional production is highly dynamic. Traditional approaches to artificial lift applications are inefficient. Artificial lift life cycle is different for unconventional wells. Production dynamics requires rethinking application of real-time downhole and surface sensing. Software tools available to analyze field data are inadequate. This course provides applicable solution paths, an overview of artificial lift and related issues applicable to unconventional and tight oil/gas wells, and production optimization, particularly real-time measurements and optimization techniques required to understand and manage the dynamic production scenarios. Besides the basics of artificial lift and real-time measurements, the training focuses on specific production and lift challenges related to the unconventional wells. Artificial lift selection and life cycle analysis are covered. Recent advances in real-time approaches to the production monitoring and lift management are discussed using field case studies. The course closes with a group exercise to develop a problem statement and solution plans for production from unconventional assets.

Learning Outcomes:
- Why and how production differs in unconventional wells.
- Artificial lift and production optimization concepts applicable for unconventional wells
- Real-time measurements and optimization in unconventional wells.

Course Content:
Day 1:
- Pre-test
- Introduction to Artificial Lift Systems and Production Optimization
- Production Challenges specific to Shale Development
- Continuous Gas-lift
- Electrical Submersible Pumping
- Hydraulic Jet and Piston Pump

Day 2:
- Reciprocating Rod Lift
- Capillary Injection
- Plunger Lift
- Selection of artificial lift for Shale Wells
  - Variables specific to Shale Well ALS Selection
  - Strengths & weaknesses of applicable lift systems

Day 3:
- Selection of artificial lift for Shale Wells
  - Lift Life Cycle and Elimination process
  - Application case studies in oil & gas wells
- Digital oil field and production optimization
  - Real-time downhole and surface measurements
  - Role of software in visualization, analysis and surveillance
  - Application Case Studies
- Lift Selection Aspects in Shale: Group Exercise

Note: this course is customizable from one to three-days length.

UNCONVENTIONAL RESERVOIRS

FEATURED INSTRUCTOR:

Robert 'Bob' Barba

Bob Barba has over 40 years of practical experience in the petroleum industry as an openhole wireline engineer, product development manager, petrophysicist, and completion optimization advisor. His primary focus is the integration of petrophysics with completion and reservoir engineering to maximize well recovery factors. He has extensive experience in both conventional and organic shale reservoirs. Bob received the Regional Formation Evaluation Award from the Society of Petroleum Engineers Southwest North America region (Permian Basin) in May of 2018. He served as a Distinguished Lecturer 1995-1996 for the Society of Petroleum Engineers on the optimization of completion designs using petrophysical and reservoir engineering inputs. He was one of 130 nominees for the 2024-35 tour as well.

Bob is a recognized industry authority on refrac candidate selection and refrac "best practices." His articles have been published in Oil and Gas Investor, American Oil and Gas Reporter, Oil and Gas Journal, and the Journal of Petroleum Technology. Bob served as an expert witness on log derived rock properties for BP in the Macondo trial. He pioneered techniques to evaluate well performance using production data and routine well log data and has applied the concept to over 5,000 wells to date. Most recent projects involve documenting refrac reorientation (URTeC paper 3724057) and documenting parent-child damage (SPE paper 212371).

Courses Taught:
- "Best Practices" for New Well Fracs and Legacy Well Refracs
- Cased Hole and Production Log Evaluation
- Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects
- Practical Interpretation of Open Hole Logs

"BEST PRACTICES" FOR NEW WELL FRACS AND LEGACY WELL REFRACS NEW

Instructor: Robert 'Bob' Barba
Discipline: Unconventional Reservoirs, Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Engineers, managers, and geoscientists that want to learn how to select the best refrac candidates and design completions for refracs and new wells that produce the maximum volume of hydrocarbons for the minimum possible cost.

Course Description:
Participants will understand why refracs work and how they can deliver superior economics to new well completions. With the processes discussed in the course the risks associated with refrac candidate selection, mechanical isolation, and refrac execution can be minimized to the lowest level possible.

Learning Outcomes:
- What should a new well or refrac produce with an optimized stimulation treatment?
- What are the "best practices" to avoid stranding hydrocarbons in both types of wells?
- Where have operators done refracs and what are their economics vs new wells?
- How refracs can help avoid new infill well 40% EUR losses from asymmetric fracs.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS WITH MS EXCEL AND ADOBE READER INSTALLED.

Course Content:
- Top ten reasons to refrac a well
- Where have refracs worked and are they economic?
- Why refracs work in organic shales
- Why refracs work in matrix permeability reservoirs
- Refrac candidate selection in organic shales
- Refrac candidate selection in matrix permeability reservoirs
- Derisking wellbore mechanical integrity issues
- "Best practices" for isolating existing perforations
- "Best practices" to maximize recovery factors
- "Best practices" to protect infill wells from asymmetric fracs
- Booking behind pipe reserves with refracs
- Case studies in organic shale and conventional reservoirs

HYDRAULIC FRACTURING: THEORY & APPLICATION

Instructor: Jennifer Miskimins, PhD
Discipline: Unconventional Reservoirs, Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
This course is intended for petroleum engineers, geologists, geophysicists, and other technical staff wanting a more in-depth understanding of hydraulic fracturing. All types of reservoir applications are discussed, but a focus is placed on the design and application in horizontal well systems. Previous knowledge of hydraulic fracturing basic concepts is helpful, but not required.

Course Description:
This course provides an in-depth look at hydraulic fracturing, first from a theoretical viewpoint, but also how this theory translates into application of the technique. The course starts with a discussion of the goals of hydraulic fracturing and the economic justifications that go along with them. From there, the reservoir characteristics such as in-situ stresses, rock mechanical properties, etc. and their impacts on hydraulic fracture behavior are covered.

Fracturing fluids and proppant types are presented, and an in-depth discussion of conductivity and the associated damage mechanisms under reservoir conditions are discussed. The impacts of such on production and reserve recovery is also highlighted. A large section of the course is dedicated to diagnostic techniques such as DFIT's, tracers, microseismic, and fiberoptics. How these techniques work, benefits and drawbacks, and potential applications are reviewed. Fracture modeling is discussed, with some model examples presented. Finally, the course concludes with a discussion of economic considerations for hydraulic fracturing design, specifically in horizontal wells.

Learning Outcomes:
- Distinguish between the different fracture lengths (created, effective, propped, hydraulic) and understand their importance in fracture design and efficiency.
- Differentiate between various fracture conductivity damage mechanisms and understand the impacts to production.
- Compare and contrast different treatment diversion options.
- Calculate in-situ stress values and understand the impacts of over- and under-pressured reservoir systems on such values.
- Distinguish between different diagnostic techniques, both indirect and direct, and determine the pros/cons of various options.

Course Content:
- What is hydraulic fracturing?
- SRV vs. enhanced permeability models
- Rock mechanics
- In situ stress
- Breakdown pressures
- Completion Types and Perforating
- Fracturing fluids
- Proppants
- Conductivity
- Diagnostics
- Hydraulic fracture modeling
- Economic optimization of treatments
- Conclusions

FEATURED INSTRUCTOR:

Jennifer Miskimins, PhD

Jennifer L. Miskimins, PhD serves as the Department Head of the Petroleum Engineering Department at the Colorado School of Mines and holds the F.H. Mick Merelli/Cimarex Energy Distinguished Department Head Chair. She instructs various classes at both the undergraduate and graduate level in stimulation, completions, and geologic field session. Jennifer advises graduate students and conducts research in the areas of hydraulic fracturing, unconventional reservoirs, and stimulation techniques. She is the Director of the Fracturing, Acidizing, Stimulation Technology (FAST) Consortium and Director of the Center for Earth Materials, Mechanics, and Characterization (CEMMC).

Jennifer holds BS, MS, and PhD degrees in petroleum engineering and has over 25 years of experience in the petroleum industry. Between her BS and graduate degrees, she worked for Marathon Oil Company in a variety of locations as a production engineer and supervisor. Dr. Miskimins started teaching at CSM in 2002 and was full-time until 2013 when she returned to industry. From 2013-2016, she continued to hold a part-time appointment at CSM, advising research and graduate students, while working for Barree & Associates. In 2016, she returned full-time to the university.

Dr. Miskimins specializes in well completions, stimulation, hydraulic fracturing, and associated production issues. She is the founder and current Director of the Fracturing, Acidizing, Stimulation Technology (FAST) Consortium and also co-directs the Center for Earth Materials, Mechanics, and Characterization (CEMMC). Her research interest focus on the optimization of stimulation treatments and the importance of such on associated recovery efficiencies.

Course Taught:
- Hydraulic Fracturing: Theory & Application

RESERVOIR MANAGEMENT OF UNCONVENTIONAL RESERVOIRS: FROM INCEPTION TO MATURITY

Instructor: Shah Kabir
Discipline: Unconventional Reservoirs, Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
Reservoir and production engineers.

Course Description:
This two-day workshop entails a fundamental understanding of well performance with the use of several tools, such as RTA and DCA. Application of DCA emphasizes matching the cumulative-production curve for retaining solution consistency and objectivity. Overall, suitability of these tools for reserves forecasting will be the cornerstone of this workshop. We will also introduce a promising semi-analytical DCA tool, the Series model. Although deterministic reserves estimation will be emphasized, probabilistic approaches will be outlined.

Obtaining some of the basic reservoir parameters with DFIT entails stress and reservoir properties, such as initial pressure and permeability. However, factors influencing the non-ideal DFIT behavior often present interpretation challenges. We will explore some of these issues while tackling some of the field responses. Finally, beyond the early production period, production of water can complicate the lift issue. We will discuss a simplified plunger-lift model to tackle this flow problem at hand. Tools involved include Kappa (RTA and PTA modules), and simple analytical diagnostic and analysis methods.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS.

Learning Outcomes:
- Explore diagnostic fracture injection testing (DFIT) and well management before production initiation.
- Forecast performance with decline-curve analysis (DCA) tools and understand their relative strengths.
- Use rate-transient analysis (RTA), when possible, to gain insights into long-term performance.
- Consider merits of reservoir simulation approach.
- Estimate reserves with a few tools in both deterministic and probabilistic frames.
- Understand the wellbore lift issue with a plunger-lift operation.
- Solution workflows for participants' specific problems.

Course Content:
- Participants discuss operational problems on pertinent topics within the workshop's scope
- Background review of each topic
- Hands-on problem-solving sessions using field data – preference: client's own data

SHALE RESERVOIR CORE WORKSHOP: SEDIMENTOLOGIC AND STRATIGRAPHIC ASSESSMENT OF ORGANIC-RICH MUDROCKS

Instructor: Ursula Hammes, PhD
Discipline: Unconventional Reservoirs
Length: 3 Days
CEUs: 2.4
Availability: Public & Private
Format: In-Person

Who Should Attend:
Geoscientists, reservoir engineers, and managers who desire to develop a better understanding of the geological, mechanical, and chemical character of mudrock systems and how mudrock attributes vary in the context of shale gas/oil reservoir exploitation.

Course Description:
TThis three-day core workshop will comprise classroom sessions, core viewing and core descriptions exercises. The workshop will focus on rock-based interpretation of mudrocks incorporating class room lectures and core examinations. Participants will learn how to apply mudrock depositional, sedimentological, and sequence stratigraphic principles and become gain an overview of geochemical, petrophysical, geomechanical and fracture classification principles to exploration areas and production assets in shale basins. Subsurface data from a variety of oil and gas shale plays will be examined. Day 3 will consist of viewing selected intervals of cores from the Bureau of Economic Geology (ie., Eagle Ford, Haynesville, Bossier, Barnett, Wolfcamp).

NOTE: Day 3 is optional for customized in-house training.

Learning Outcomes:
- Characterize mudrock facies and identify facies and sequences in cores and be able to tie those to well-log character.
- Assess controls on source rock deposition, reservoir heterogeneities, and determine frackable intervals.
- Recognize and quantify the rock properties that will have an impact on completion success.
- Learn how to characterize shale reservoirs.

Course Content:
Day 1:
- Approaches to understanding the geology of shale-gas/oil plays
- Overview of organic-rich mudrock systems
  - Carbonate-dominated, clastic-dominated systems, and mud-dominated
  - Examples from different North American resource plays
- Techniques for characterization of mudrocks (overview)
  - Sedimentology, sequence stratigraphy, geochemistry, petrophysics, seismic and geomechanics, and fractures
- Factors determining organic-rich deposits
  - Paleogeography, ocean chemistry, climate, and modern examples (Cariaco Basin)

Day 2:
- Stratigraphic and depositional processes in shale basins
- Stratigraphic framework
- Interpretation of depositional environments in shale basins
- Facies interpretations
  - Calcareous, siliceous, and clay-rich shales
- Mudrock sedimentology
- Inter- and intrabasinal variations – examples from different shale basins (Bakken, Barnett, Eagle Ford, Haynesville, Marcellus, Wolfcamp)

Day 3:
- Core viewing: Introduction to selected intervals of cores from the Bureau of Economic Geology
  - Barnett, Bossier, Eagle Ford, Haynesville, Wolfcamp

SHALE RESERVOIR WORKSHOP: ANALYZING ORGANIC-RICH MUDROCKS FROM BASIN TO NANO-SCALE

Instructor: Ursula Hammes, PhD
Discipline: Unconventional Reservoirs, Geoscience
Length: 2, 4 or 5 Days
CEUs: 1.6, 3.2 or 4.0
Availability: Private
Format: In-Person

Who Should Attend:
Geoscientists, reservoir engineers, and managers who desire to develop a better understanding of the geological, mechanical, and chemical character of mudrock systems and how mudrock attributes vary in the context of shale gas/oil reservoir exploitation.

Course Description:
This unique training course can be customized to your staff's skill needs by choosing between the modules below. The class will utilize lectures, core examination and exercises, to address the reservoir characterization, sedimentology, facies, sequence stratigraphy, petrophysics, fractures, and geochemistry of shale-gas/oil bearing mudrocks.

This workshop focuses on rock-based interpretation of mudrocks from basin to nano-scale. Participants will learn how to use core, cuttings, geochemical, and petrophysical data to characterize mudrocks and apply mudrock depositional, sedimentological, sequence stratigraphic, geochemical and petrophysical principles to exploration areas and production assets in shale basins. Subsurface data from a variety of oil and gas shale plays will be examined.

Client management will pre-select 2, 4 or 5 of the Modules below for their private / in-house course.

Learning Outcomes:
- Appraise the variety of shale systems from basin to nano-scale.
- Characterize mudrock facies and identify facies and sequences in cores and be able to tie those to well-log character.
- Assess and interpret geochemical data critical to understanding mudrock systems.
- Judge controls on source rock deposition, reservoir heterogeneities, and determine frackable intervals.
- Recognize and quantify the rock properties that will have an impact on completion success.
- Learn how to characterize shale reservoirs.

Course Content:
- Module 1: Approaches to understanding geology of shale-gas/oil plays
- Module 2: Stratigraphic/depositional processes in shale basins
- Module 3: Geochemical tools and geochemistry review
- Module 4: Reservoir characterization and reservoir quality of mudrocks
- Module 5: Production and well completion

OPTIONAL: 3 hour afternoon field trip to Eagle Ford/Austin Chalk outcrops in Austin.

UNCONVENTIONAL OIL AND GAS

Instructor: Ruben O. Caligari
Discipline: Unconventional Reservoirs
Length: 2 Days
CEUs: 1.6
Availability: Private
Format: In-Person

(This course is available in Spanish)

Who Should Attend:
Technical personnel with experience in oil and gas that need to learn the nature and behavior of unconventional accumulations of oil and gas and the distinctive aspects of their development. Entry-level professionals that will work in unconventional developments and need to understand the meaning of unconventional in this context. No previous knowledge of the subject is required.

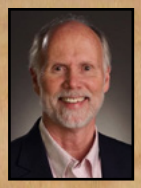
Course Description:
Development of unconventionals oil and gas has significantly shifted both industry procedures and global energy balance in 21st century. Participants of this course will discuss characteristics of conventional oil and gas to better understand why other accumulations are considered unconventional. Various unconventional systems currently under exploitation will be presented with specific focus in tight and shale systems, with the highest potential in Argentina and other countries within the region. The complex trapping mechanism of tight and basin-centered gas will be discussed, as well as well completion techniques and results.

Participants will identify and understand key factors in defining the quality of plays. Methodology for assessing technically recoverable resources will be analyzed as well as different approaches for production forecasting. Horizontal drilling and multiple stage fracturing technologies as applied in current developments will be reviewed and examples of the most prolific plays in Argentina will be presented.

Learning Outcomes:
- Understand "conventional" oil and gas and define unconventional.
- Types and historical evolution of unconventional resources.
- Characterization and examples of extra heavy oil mining, oil shales mining, and coalbed methane.
- Characterization, trapping mechanisms, development, and examples of tight gas and basin-centered gas.
- Characterization, quality factors, and examples of shale oil and gas.
- Horizontal wells and multistage fracturing.
- Understand the concept of SRV, production forecasting, and reserves assessment.
- Risk assessment and project management of unconventional developments.
- Environmental aspects of unconventional developments.

FEATURED INSTRUCTOR:

Stephen Sonnenberg, PhD



Dr. Stephen Sonnenberg is a professor and holds the Charles Boettcher Distinguished Chair in Petroleum Geology at the Colorado School of Mines. He specializes in unconventional reservoirs, sequence stratigraphy, tectonic influence on sedimentation, and petroleum geology. A native of Billings, Montana, Sonnenberg received his BS and MS degrees in geology from Texas A&M University and a Ph.D. degree in geology from the Colorado School of Mines. He has over twenty-five years experience in the industry.

Steve has served as President of several organizations including the American Association of Petroleum Geologists, Rocky Mountain Association of Geologists, and Colorado Scientific Society. He also served on the Colorado Oil and Gas Conservation Commission from 1997-2003 and was the Chair of the Commission from 1999-2003.

He is the recipient of the Young Alumnus Award, Outstanding Alumnus Award, and Mines Medal from the Colorado School of Mines, Distinguished Achievement Medal from Texas A&M University, distinguished service awards from AAPG and RMAG, and honorary membership awards from AAPG, RMAG and the Colorado Scientific Society. In 2013, he was awarded the Halbouty Medal from AAPG.

Courses Taught:
- Carbon Capture Utilization and Storage - A Geological Perspective
- Elements of Energy Geology - Basin Analysis & Subsurface Energy Storage
- Elements of Petroleum Geology
- Reservoir Characterization for Mudrock Reservoirs
- Unconventional Resource Plays - Workshop

UNCONVENTIONAL RESOURCE PLAYS - WORKSHOP

Instructor: Stephen A. Sonnenberg, PhD
Discipline: Unconventional Reservoirs, Geoscience, Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, petrophysicists, reservoir engineers and managers who are exploring for and developing oil and gas fields in unconventional, basin-centered petroleum systems. Basic knowledge of well log evaluation is recommended.

Course Description:
This three-day workshop introduces sound evaluation techniques used in choosing and developing "unconventional resource new ventures." It combines geology, reservoir engineering, reserves evaluation, economic forecasting and the concepts of multivariate analysis to develop skills that help predict productivity in oil and gas systems. The workshop covers gas and oil plays in shale and stacked tight sands that are developed with horizontal and vertical wells, and completed and stimulated with hydraulic fracturing.

Learning Outcomes:
Attendees will be able to:
- Demonstrate knowledge of reservoir attributes (variables) pertaining to unconventional resource play viability and scale.
- Screen (evaluate) all play types. For example, what will work, what is economically feasible, what play has critical flaws, what play is basin-centered but is marginal because of its size and depth.
- Develop an idea of the viability of new venture oil/gas plays, compare them to other global plays, and develop a clear idea of reservoir/geologic mechanisms and acceptability.
- Recognize and appraise how a play will perform and forecast potential resources. Include examples of winners and losers, using actual cases. REALLY know what you are evaluating quantitatively with comparison to other global play results.
- Evaluate tight gas sands over a long vertical interval and shale gas over a finite interval developed with horizontal wells. Evaluation of plays with an inverted fluid column (water to oil to gas transitions). Prevent grave and costly mistakes.
- Integrate mixed parameters such as electric log values of porosity, resistivity, and "cross-over gas effect." Identify key reservoir "drivers" versus depth and location (sweet-spot identification). Integrate with thermal maturity and pressure data (always as a function of depth, subsea depth or depth to stratigraphy.
- Apply intuitive principles to more accurately predict oil/gas productivity in tight rocks.
- Understand the hydraulic fracture stimulation treatments employed by operators.

Course Content:
- DAY 1: Unconventional Tight Gas
- DAY 2: Unconventional Tight Oil Reservoirs
- DAY 3: Unconventional Resource Assessment

UNCONVENTIONAL RESERVOIRS COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE							INSTRUCTOR
Artificial Lift and Real-Time Optimization for Unconventional Assets		✓	✓				Chokshi
"Best Practices" for New Well Fracs and Legacy Well Refracs		✓	✓				Barba
Hydraulic Fracturing: Theory & Application		✓	✓				Miskimins
Reservoir Management of Unconventional Reservoirs: From Inception to Maturity		✓	✓				Kabir
Shale Reservoir Core Workshop: Sedimentologic and Stratigraphic Assessment of Organic-Rich Mudrock			✓				Hammes
Shale Reservoir Workshop: Analyzing Organic-Rich Mudrocks From Basin To Nano-Scale	✓		✓				Hammes
Unconventional Oil and Gas			✓				Caligari
Unconventional Resources Plays – Workshop	✓	✓	✓				Sonnenberg

Geoscience | Engineering | Unconventional | Energy Transition | Formation Eval | Multi-Disciplinary

Business Advisory Services

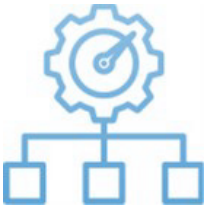
SCA's business advisory services are led by **Dr. Amalia Olivera Riley**, a business leader with over 30 years of experience in the oil and gas industry. She has held leadership and executive level positions with companies including ExxonMobil, Repsol, and Tullow Oil. Her experience across the globe includes projects worked on five continents covering 40+ countries in deep water, onshore, and unconventional environments.

Amalia's strengths include her strategic vision, technical and organizational leadership, and designing and implementing change. She has a PhD in Geoscience from Purdue University.

Why choose SCA's Business Advisory Services?

- Impacts company performance and bottom-line delivery.
- Combines extensive hands-on experience and direct access to high-quality technical experts and training.
- Led by high-profile oil & gas executives and managers.
- Tried and tested experience across a broad range of majors, mid-size and independent companies in the US, UK, and Europe in line with SCA's "Excellence That Runs Deep" principle.
- Brings multicultural viewpoints and insights.
- Leverages SCA's track record of effective technical consulting.

Asset Value Optimization



Organizational Efficiency

Non-Operator Influence

Strategy

Transformation

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CARBON CAPTURE UTILIZATION AND STORAGE - A GEOLOGICAL PERSPECTIVE

Instructor: Stephen A. Sonnenberg, PhD
Discipline: Energy Transition, Geoscience, Engineering, Multi-Disciplinary & Intro
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, and engineers who are interested in geologic carbon capture utilization and storage.

Course Description:
This course will discuss carbon capture utilization and storage (CCUS) from a geologic perspective. Examples from carbon capture utilization (CCU) including enhanced oil recovery (EOR) projects will be shown. Known and proposed carbon capture storage (CCS) examples will also be covered.

Learning Outcomes:
- CCUS Options.
- Screening Criteria for CCU.
- Screening Criteria for CCS.
- Relevant Mineral Reactions to Consider.
- Monitoring of Projects.
- Induced Seismicity.

Course Content:
- Introduction and Geologic Considerations
  - Greenhouse gases
  - CCUS options
  - CO_2 phase behavior
  - Subsurface brines
  - Some mineral reactions
  - Hydrocarbon traps (key elements)
  - Induced seismicity
- CO_2 Storage in Depleted Oil and Gas Reservoirs
  - Screened for production volume, depth, proximity of anthropogenic CO_2 source
  - Reservoir size and properties
  - Trap
  - Seal
- Enhanced Oil Recovery and Enhanced Gas Recovery
  - What is it?
  - Where is it applied?
  - How does it work?
  - Examples
  - EOR in unconventionals
- Gas Storage Fields and CO_2 Options
  - Review of gas storage field types
    - Depleted oil and gas fields
    - Salt caverns, mines, etc.
    - Aquifer storage fields
  - CO_2 Options
- Enhanced Coalbed Methane (CBM) and CO_2 Storage in Deep Coal Seams
  - CBM basics
  - Enhanced CBM with CO_2
  - CO_2 options in deep un-mineable coal seams
- Enhanced Shale Gas and CO_2 Storage
  - Shale gas basics
  - CO_2 options
- CO_2 Injection in Saline Aquifers
  - Selection criteria
  - Examples
- CO_2 Fields and Options
  - Review of CO_2 fields
  - CO_2 options
- Enhanced Geothermal Options
- CO_2 and Carbonation Options
  - Geological disposal - mineralization
  - Mineral reactions
  - Examples
- Summary and Wrap-Up

CARBON CAPTURE UTILIZATION AND STORAGE - AN ENGINEERING PERSPECTIVE

Instructor: Christine Ehlig-Economides, PhD and Dimitrios Hatzignatiou, PhD
Discipline: Energy Transition, Geoscience, Engineering, Multi-Disciplinary & Intro
Length: 3 Days (Classroom), 5 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Petroleum engineers and geoscientists interested or already engaged in methane and carbon dioxide (CO_2) capture from industrial and agricultural sources and from the air, CO_2 utilization for enhanced oil recovery (EOR), and CO_2 storage in depleted reservoirs and saline aquifers.

Course Description:
The primary topics of discussion during this course are (1) Methane leak avoidance and CO_2 emissions capture, (2) CO_2 EOR, (3) Blue hydrogen and CO_2 transport and storage, (4) Saline aquifer storage with Monitoring, Reporting and Verification (MRV), and (5) Economics.

Learning Outcomes:
- Estimate CO_2 storage capacity, well injectivity, a suitable Monitoring, Reporting, and Verification (MRV) plan, and storage cost in $/tonne, based on geologic models and (where applicable) reservoir production data in both clean and shaley intervals.
- Explain quantitative evidence for sustainable CO_2 storage in terms the public can understand.
- Locate information essential to storage asset evaluation from digital publications and online data.

Course Content:
- Course Rationale
  - Uses for fossil resources
  - Greenhouse gas (GHG) emission sources
  - GHG storage options
  - CO_2 capture and utilization
- Decarbonizing Oil
  - Maximized CO_2 storage in depleted oil reservoirs
  - Currently active EOR+ projects
  - Carbon neutral crude oil
- Decarbonizing Natural Gas
  - CO_2 storage in depleted gas reservoirs
  - CO_2 storage in a blue hydrogen economy
  - Hydrogen storage
- CO_2 Storage in Saline Aquifers
  - CO_2 storage in deep saline aquifers
  - Wells and CO_2 injection
  - Monitoring, Reporting, and Verification
- Economics
  - Are we making money yet?
  - Incentives
  - Value products

ENERGY TRANSITION FOR PETROLEUM PROFESSIONALS

Instructor: D. Nathan Meehan, PhD, PE
Discipline: Energy Transition, Geoscience, Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Reservoir engineers, petroleum engineers, production engineers, geologists, geophysicists, managers, independent operators, marketing personnel and anyone who needs a practical understanding of the energy transition and how it will affect future oil and gas activities and what the opportunities are to be “part of the solution.”

Course Description:
This course is designed for energy professionals with an understanding of oil and gas operations and activities but not necessarily any background in climate change, energy transition, life cycle analysis or alternative fuels. The course emphasizes the role of fossil fuels in a world with increasing drivers away from such fuels. Practical approaches to minimize the carbon impact of oil and gas operations are presented.

Learning Outcomes:
- Understanding of key drivers for alternative energy and the energy transition.
- Understanding of quantitative ways to evaluate carbon intensity of oil and gas operations and ways to lower that impact.
- Understanding of key policy issues associated with the energy transition.
- Understanding of carbon capture, utilization, and storage (CCUS) and other major opportunities to profit from the energy transition.

Course Content:
- History of energy
- Drivers for the transition
  - Macroeconomics
  - Climate change
  - Goverment and policy
  - Technology and cost
  - Differing regional baselines and transition pathways
- Not all zero-carbon power comes from renewables, not all renewables are carbon-free
- Decarbonizing oil and gas
- CCUS
- Industry-specific issues
- Case studies
- The way ahead

FUNDAMENTALS OF CO_2 SEQUESTRATION: MECHANISMS AND PROCESSES NEW

Instructor: Dimitrios Hatzignatiou, PhD
Discipline: Energy Transition
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Petroleum engineers, geoscientists and CCS/CCUS project managers interested or already engaged in geologic sequestration of captured carbon dioxide (CO_2) from industrial and agricultural sources and from the air in depleted hydrocarbon reservoirs and saline aquifers.

Course Description:
The primary topics of discussion during this course are (1) impact of CO_2 injection on storage formation rock properties, (2) CO_2 migration within the storage formation and potential leakage outside of the storage pore space, (3) impact of CO_2 injection on well injectivity, and (4) CO_2 chemical interaction with formation rock.

Learning Outcomes:
- Clarify the importance of the four types of CO_2 trapping mechanisms and their impact on CO_2 storage capacity, injectivity, and confinement.
- Provide fundamental concepts pertaining to the mineralization process of CO_2 sequestration related to CO_2 injectivity, migration, and potential leakage.
- Explain advantages and disadvantages of CO_2 storage in saline aquifers versus depleted hydrocarbon fields.

Course Content:
- CO_2 Geological Sequestration Options
- Storage Formation Rock and Fluid Properties
- CO_2 Properties
- CO_2 Trapping Mechanisms – Importance vs Time
- CO_2 Sequestration Processes Affecting CO_2 Capacity, Injectivity and Confinement
  - CO_2/Rock and CO_2/Water Interactions
  - Impact of CO_2 Injection on Well Injectivity
- CO_2 Storage in Hydrocarbon Reservoirs vs Saline Aquifers

GEOMECHANICS ASPECTS OF CCS PROJECTS NEW

Instructors: Ewerton Araujo, PhD, Fermin Fernandez-Ibañez, PhD, and Jorge Pastor, PhD
Discipline: Energy Transition, Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, engineers, managers, and decision makers.

Course Description:
This course provides an overview of the most critical geomechanical aspects in Carbon Capture and Sequestration (CCS). Attendees will learn about geomechanics principles, concepts, required data, and workflows as they apply to the assessment of the key geomechanics risks in CCS projects. We will discuss the main geomechanical risks and how they may vary from project to project. We will also address data requirements to effectively de-risk a project as well as the type of models that are best suited to address geomechanical risks and their impact on project performance. Case studies will be covered as practical examples to demonstrate workflows and screening tools.

Learning Outcomes:
- How to build a geomechanical model (data, measurements, calculations).
- Risks of saline aquifers vs. depleted reservoirs.
- Thermal stress and injection pressure impacts.
- Assess potential impact of natural fractures on plume migration.
- Assess the fault reactivation risk & induced seismicity potential.

Course Content:
- Chapter 1. Overview of Geomechanics in the Energy Industry
- Chapter 2. Stress-Strain Behavior of Rocks (Deformation and Failure)
- Chapter 3. In Situ Stress and Pore Pressure Characterization
- Chapter 4. Mechanical Properties (Before and After CO2 Injection)
- Chapter 5. Stress Path Impact (Depleted reservoirs vs. Saline Aquifers)
- Chapter 6. Wellbore Repurpose Assessment
- Chapter 7. Thermal Stress & Injection Pressure Impacts
- Chapter 8. Cap Rock Integrity
- Chapter 9. Natural Fractures (Permeability, Stress-Dependency)
- Chapter 10. Microseismicity
- Chapter 11. Fault Stability and Induced Seismicity
- Chapter 12. Case Studies

GEOMECHANICS FOR GEOTHERMAL PROJECTS NEW

Instructors: Ewerton Araujo, PhD, Fermin Fernandez-Ibañez, PhD, and Jorge Pastor, PhD
Discipline: Energy Transition, Engineering
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, engineers, managers, and decision makers.

Course Description:
This course provides an overview of the most critical geomechanical aspects in Geothermal Energy. Attendees will learn about geomechanics principles, concepts, and workflows as they apply to the assessment of the key aspects in Geothermal projects. We will discuss the main geomechanical risks and how they may vary from project to project. We will also address data requirements to effectively de-risk a project as well as the type of models that are best suited to address geomechanical risks and their impact on project performance. Case studies will be covered as practical examples to demonstrate workflows and screening tools.

Learning Outcomes:
- Geomechanics Fundamentals.
- Poroelastic effects on fault stability & induced seismicity.
- Thermal stress impacts on drilling, stimulation, production, and geohazards.
- Natural fractures impact on performance.
- Stress shadows impacts on hydraulic fracturing.

Course Content:
- Chapter 1. Overview of Geomechanics in the Energy Industry
- Chapter 2. Stress-Strain Behavior of Rocks (Deformation and Failure)
- Chapter 3. In Situ Stress and Pore Pressure Characterization
- Chapter 4. Thermal Stress Impacts
- Chapter 5. Drilling Issues (Borehole Stability, Circulation Loss)
- Chapter 6. Hydraulic Fracturing Fundamentals
- Chapter 7. Stress Shadows
- Chapter 8. Natural Fractures (Permeability, Stress-Dependency)
- Chapter 9. Microseismicity
- Chapter 10. Geohazards (Poroelasticity, Fault Stability, Induced Seismicity
- Chapter 11. Case Studies

GEOTHERMAL ENERGY NEW

Instructor: Silviu Livescu, PhD and Birol Dindoruk, PhD
Discipline: Energy Transition, Engineering
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Project/product managers, R&D engineers/ scientists, sales engineers, and technical support engineers.

Course Description:
This course will review all geothermal systems (hydrothermal, enhanced, advanced) for geothermal power generation and direct use systems, focusing on subsurface engineering (resource characterization, resource engineering, production, data science).

The class will be interactive, with the entire time split almost equally between lectures and class discussions. Technical papers will be handled for each topic and, in order to enhance their critical thinking and learning experience, students will have the opportunity to discuss them in class.

Learning Outcomes:
- Understanding of geothermal energy systems.
- Understanding of current technology bottlenecks and low hanging fruits across technology, policy, business, etc.
- Understanding of current tools for geothermal exploration.
- Understanding of technology overlaps and gaps between the geothermal and oil and gas industries.
- Understanding of current theoretical/ numerical models and gaps in fundamental and applied research and laboratory/field validation cases.

Course Content:
- Geothermal Energy Basics
- Hydrothermal Systems
- Enhanced Geothermal Systems
- Advanced Geothermal Systems
- Geothermal Heating and Cooling Systems
- Chemical Composition of Geothermal Fluids and Impact on Well and Plant Corrosion and Flow Assurance
- Techno-Economic Analysis of Geothermal Systems
- Hybrid Systems: Geothermal Carbon Capture Utilization and Storage, Geothermal/ Direct Air Capture, Geothermal/H_2, Geothermal/Concentrating Solar-Thermal Power, etc.

"Education is the most powerful weapon which you can use to change the world."
Nelson Mandela

NAVIGATING CCUS - GULF COAST REGION - WORKSHOP NEW

Instructors: PK Pande, PE
Discipline: Energy Transition, Geoscience, Engineering, Multi-Disciplinary & Introductory
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Professionals with interest in Carbon Capture and Sequestration for the Gulf Coast Region; engineers, geoscientists, supervisors, managers, department heads, management, economists, and legal and accounting.

Course Description:
This commercial, technical briefing and mini course aims to accelerate and elevate understanding of the landscape, foundational elements and historical context of carbon capture and sequestration in the Gulf Coast Region. Attending the briefing will enable understanding of the wide range of issues encompassing the "CCUS Maze", providing grounding on both commercial and technical aspects of sequestration during this energy transition. All system components from emissions, pipelines, wells and subsurface are integrated to enable full life cycle evaluations. A holistic integrated geo-technical, petroleum systems based commercial approach is utilized. Topics covered include providing historical context on what the industry has already learned and have confidence with for carbon capture. Injection storage areas, characterizing sources and the injection capacity needs are outlined. The classification of storage resources, application of tax credits, regulatory requirements and tackling full life cycle economics are addressed.

Learning Outcomes:
- Develop appreciation for the wide range of CCUS issues encompassing the process, emissions, storage possibilities, storage management, transport, regulatory, public policy, value chain, technology challenges and full life cycle evaluations.
- Understand drivers behind major projects in the Gulf Coast Region.
- Understand historical context and key industry learnings.
- Explore key areas of North America for CO_2 flooding and miscible gas injection.
- Develop geologic understanding of saline aquifer storage potential.
- Understand characterization of emissions for the Gulf Coast Region.
- Overview of regulatory challenges for injection well permitting.
- Storage Management Classification highlights with key commercial relevance.
- Section 45Q tax credits updates and application for project economics.
- Understand Carbon capture cost ranges.

Course Content:
- Landscape: Overview, Foundational Principles, CCUS Mechanisms, North America Projects, Global, Industry Projects Learnings, Announced Projects
- Development: Onshore North America, GoM Saline Aquifers, Emissions Characterization, Emissions Handling and Process Engineering, Regulatory, Pipeline Networks and Engineering, Integrated Systems Workflow
- Commercial: Pore Space Evaluation, Offshore Pore Space Leasing, Economics, Section 45Q Tax Credit, Project Management, Supply Chain, Risk Analysis and Red Flags
- Global Integration

OPEN HOLE AND CASED HOLE PETROPHYSICAL INPUTS FOR CARBON CAPTURE PROJECTS NEW

Instructor: Robert 'Bob' Barba
Discipline: Energy Transition, Geoscience
Length: 2 Days (Classroom), 4 Half-Day Sessions (Live Online)
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists and asset managers involved in feasibility studies for carbon capture projects in saline aquifers and depleted hydrocarbon bearing reservoirs.

Course Description:
Openhole and cased hole petrophysical inputs play a crucial role in carbon capture projects, especially when dealing with subsurface storage of captured carbon dioxide (CO_2) in geological formations. These inputs help assess the suitability of a particular reservoir for CO_2 storage and monitor the behavior of CO_2 within the reservoir over time. The process involves the integration of openhole and cased hole log data with the subsurface geological characterization to estimate the storage potential of these reservoirs. The same data suites are used to estimate the potential uplift for CO_2 injection into depleted hydrocarbon reservoirs.

In addition to the pore volume estimation and mapping the process involves predicting injection rates with permeability data and injection pressure limits with rock properties data to ensure the CO_2 stays in the ground. Pore volume estimates in complex poro-perm reservoirs are refined with the Stiles-George statistical net pay analysis developed by Exxon for their West Texas carbonates. Wellbore integrity is crucial as well to avoid communication behind casing and the cased hole tools that evaluate that are discussed. The course emphasizes the importance of calibrating log derived permeability and in-situ stress profiles to measured injection test data with step rate, falloff, and diagnostic fracture injection testing (DFIT).

Learning Outcomes:
- What key reservoir and geomechanical properties require characterization in a CCUS project.
- What open hole and cased hole measurements are available to obtain these.
- What field procedures can be used to confirm these measurements (DFITs, falloff tests, etc.)
- What calculations can be made to predict storage capacity in saline aquifers.
- What calculations can be made to predict uplift in depleted hydrocarbon reservoirs
- What calculations and cased hole measurements can be made to predict seal integrity.
- What cased hole measurements can be made over time across the reservoir to monitor plume growth.

Course Content:
- Porosity
- Permeability
- Formation Thickness
- Lithology
- Caprock Integrity
- Wellbore Integrity
- Depth and Pressure
- Temperature
- Salinity and Brine Properties
- Rock Mechanical Properties
- Well Data
- Geological Modeling
- Monitoring Infrastructure

ENERGY TRANSITION COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE							INSTRUCTOR
Carbon Capture Utilization and Storage - A Geological Perspective	✓	✓		✓		✓	Sonnenberg
Carbon Capture Utilization and Storage - An Engineering Perspective	✓	✓		✓		✓	Economides/ Hatzignatiou
Energy Transition for Petroleum Professionals	✓	✓		✓			Meehan
Fundamentals of CO_2 Sequestration: Mechanisms and Processes	✓	✓		✓			Hatzignatiou
Geomechanics Aspects of CCS Projects		✓		✓			Araujo, Fernandez-Ibañez, & Pastor
Geomechanics for Geothermal Projects		✓		✓			Araujo, Fernandez-Ibañez, & Pastor
Geothermal Energy		✓		✓			Livescu & Dindoruk
Navigating CCUS - Gulf Coast Region - Workshop	✓	✓		✓		✓	Pande
Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects	✓			✓			Barba

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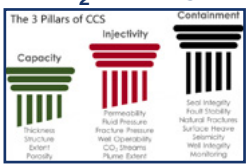
Subsurface Alliance

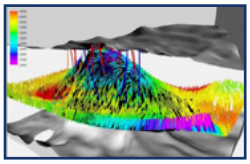
Led by Managing Partners **Ewerton Araujo, PhD**, **Fermin Fernandez-Ibañez, PhD**, and **Jorge Pastor, PhD**, SA is a network of subsurface specialists using a Team-of-Teams approach to efficiently solve problems that have a direct impact in today's evolving energy industry. SA offers comprehensive services to help mitigate risks at every stage of a project. Through geoscience and engineering tools, SA delivers world-class models and consulting and training.

CO_2 Storage



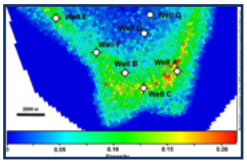
Geothermal

Geomechanics

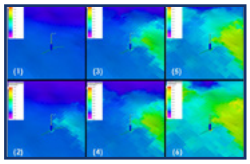


Fractured Reservoirs

Geoscience



Reservoir Engineering



Geomechanics Aspects of CCS Projects

Description:
Learn about geomechanics principles, concepts, required data, and workflows as they apply to the assessment of the key geomechanics risks in CCS projects.

Learning Outcomes:
- Building a geomechanical model.
- Risks of saline aquifers vs. depleted reservoirs.
- Thermal stress and injection pressure impacts.

Geomechanics of Geothermal Projects

Description:
Address data requirements to de-risk geothermal projects and the type of models best suited to address geomechanical risks and impacts on performance.

Learning Outcomes:
- Fundamentals of geomechanics.
- Poroelastic effects on fault stability & induced seismicity.
- Stress impacts on drilling, stimulation, production, geohazards.

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CASED HOLE AND PRODUCTION LOG EVALUATION

Instructor: Robert 'Bob' Barba
Discipline: Formation Evaluation, Engineering
Length: 4 Days (Classroom), 8 Half-Day Sessions (Live Online)
CEUs: 3.2
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Reservoir and production engineers and geologists, cased hole sales engineers, petrophysicists, log analysts and others involved in maximizing recovery, identifying production problems or planning workover operations.

Course Description:
This comprehensive, up-to-date course covers new and traditional wireline diagnostic techniques for cased wells and emphasizes three major factors. 1.) Evaluation of formation through casing focuses on locating oil, gas and water downhole, determining their saturations and monitoring their movement over time. 2.) Well integrity applies a variety of cement bond logging and casing inspection techniques to confirm zonal isolation and detect mechanical damage, corrosion, scale, perforations. 3.) Water identification and fluid contribution emphasizes techniques to quantify the sources of water, oil and gas production for control of the production profile or as inputs to reservoir modeling. Special consideration is given to the newest logging techniques for highly deviated and horizontal wells.

Learning Outcomes:
- Quickly recognize clean gas, oil and salt water zones on Gamma Ray and Sigma logs.
- Calculate fluid saturations from Sigma logs in both clean and shaley intervals.
- Assess cement quality, compute bond index, appreciate the shortcomings of this measurement and select a suitable bond log tool.
- Compute the well flow profile (zonal contributions) from the Spinner and Fluid ID surveys.
- Use temperature log to detect contributing zones and possible channels.

Course Content:
- Overview of cased hole logs
- Formation evaluation
- GR and CNL
- Pulsed neutron sigma and C/O logs
- Resistivity and acoustic
- Well integrity
- Conventional, directional and pad tools
- Pulse echo techniques
- Casing inspection techniques
- Fluid contribution
- Classic PLT approach
- Oxygen activation and PN techniques
- New tools for horizontal wells

FEATURED INSTRUCTOR:

Selim Shaker, PhD

Selim Shaker, PhD consults for Geopressure Analysis Services Inc. (G.A.S). He received his BSc, MSc and PhD in Geology from ASU, Egypt, and a diploma in Hydrogeology from Prague University (UNESCO). With over 35 years in the oil industry, he started his career in Egypt as a well-site, stratigrapher and structural geologist. During his 30 years of U.S. domestic service, his main function as Exploration Geologist was prospect generation in offshore Gulf of Mexico (Shelf and Deepwater), onshore TX and LA, Egypt, NW Australia, Algeria, Libya, North Sea and China.

He established G.A.S. to focus on pore-fracture pressure prediction, evaluating prospects' risk, geopressure compartmentalization, seal integrity and salt-sediments interaction on leads and prospects worldwide especially in the Gulf of Mexico. Dr. Shaker specializes in pre- and post-drilling risk assessment of a prospect.

Dr. Shaker has published over 40 papers and articles regarding the application of geopressure in exploration and drilling. He has taught several geopressure courses to the AAPG, SEG, HGS, and multiple in-house courses for domestic and international clients. He is an active member of AAPG, SEG, CSEG, AADE, EAGE, HGS and GSH.

Courses Taught:
- For Safe Drilling: Formation - Fracture Pressure Interpretations and Analysis
- Pore Pressure, Fracture Pressure, and Well-Bore Stability
- Seal and Reservoir Pressures Analysis for E&P Prospect's Risk Assessment

PORE PRESSURE, FRACTURE PRESSURE, AND WELL-BORE STABILITY

Instructor: Selim Shaker, PhD
Discipline: Formation Evaluation
Length: 5 Days (Classroom), 10 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
Geologists, geophysicists, drilling/reservoir engineers, well log analysts, basin-model specialists, managers, and support staff involved in exploration, development, and drilling.

Course Description:
This course uses the models of geology, rock-mechanics and hydrodynamics to predict and appraise subsurface geopressure and, consequently, evaluate geopressure drilling hazards and bore-hole instability pre-and during drilling operations. Participants will learn how to calculate and run their own pore-frac pressure (PP-FP) prediction and analyses based on a geo-scientific foundation rather than software design. The course applies an improved conventional and new method of calculating pore – frac pressure and also discusses some of the pitfalls related to specific widely used applications.

The course proceeds from the known (measured pp) to the unknown (predicted pp). It explains the development of subsurface geopressure compartments with increasing depth and their impact on formation (reservoirs and seals) pressure evolution, drilling prognoses, and hydrocarbon entrapments. This course will give you the knowledge to tailor your interpretations to adopt for the geological setting, subsurface compartmentalization, and expected hydrocarbon heights. Supra and sub-salt models, fault seals, strat-geopressure fairways, and drilling challenges (especially in deepwater) are some of the main topics of this course.

Learning Outcomes:
- Understand the different methods and pitfalls of subsurface pore-fracture predictions before drilling and their calibration during and post drilling.
- Comprehend the importance of geopressure compartmentalization and its impact on evaluating trap seal integrity, salt basins exploration risk, hydrocarbon column thickness etc.
- Understand the effect of pore-frac pressure – geomechanics interrelation on drilling challenges due to bore-hole instability (caving, tight holes, lost circulation and kicks etc.).
- Assess drilling safety, especially in deepwater, such as shallow water flow (SWF), narrow drilling tolerance window (DTW), kicks, lost circulation (LOC), dual gradient drilling (DGD), and managed pressure drilling (MPD).
- Hands-on measurement and prediction data and their applications for E&P in case histories formats.

Course Content:
- Causes, Models and Definitions
- Hydrostatic, Geopressure, and Hydrodynamics
- Pore Pressure Plots (PSI and PPG MWE) Including Pitfalls
- Models and Methods Used for PP – FP Prediction (Pre-Drilling, While Drilling, Post-Drilling)
- Bore-Hole Instability: Causes, Diagnoses, and Combating
- Analysis and Applications for Lead and Propsect Evaluation
- Salt Basins

PRACTICAL INTERPRETATION OF OPEN HOLE LOGS

Instructor: Robert 'Bob' Barba
Discipline: Formation Evaluation, Engineering
Length: 5 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Reservoir engineers, petroleum engineers, production engineers, geologists, geophysicists, managers, independent operators, marketing personnel and anyone who needs a practical understanding of open hole log interpretation.

Course Description:
This course requires no prior knowledge of logs or log interpretation. Attendees will acquire understanding and basic interpretation techniques needed to interpret open hole well logs. Both quick-look qualitative interpretations and more rigorous quantitative interpretations are covered. The course is generic in technical scope, no specific software is used. Equations are solved by hand with a calculator. Both the theory and practice of practical, applied interpretation are covered as well as practical advice, applied exercises, discussions and the study of actual logs. The accompanying manual provides a useful reference for attendees to use after the conclusion of the course.

Learning Outcomes:
- Determination of main lithologies and volumes of each.
- Calculation of porosity.
- Detection of hydrocarbons, and quantification.
- Learn systematic log interpretation procedure & real world practicalities.
- Uses and limitations of main specialty logging tools.

Course Content:
- What is open hole well logging?
- Basic rock properties
- Well and wellbore environments
- Lithology indicators and volume of shale
- Porosity logs
- Resistivity logs
- Quick-look (qualitative) interpretation
- Quantitative interpretation: Water saturation calculations
- How to run logs
- Real world practicalities of interpretation
- Class interpretation of actual field logs

Participant Testimonials:
"Very good instructor! Very educational and very comprehensive information. I would definitely recommend him again." - Joy B.

"Excellent knowledge and great energy in presenting. He really kept us engaged!" - Kevin T.

"Bob is enthusiastic and engaging and I appreciate his honesty in presenting both advantages and shortcomings of each tool/method." - Mark D.

PRESSURE TRANSIENT TEST DESIGN AND INTERPRETATION

Instructor: Christine Ehlig-Economides, PhD
Discipline: Formation Evaluation, Engineering
Length: 5 Days (Classroom), 10 Half-Day Sessions (Live Online)
CEUs: 4.0
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Engineers and geoscientists interested in well and reservoir evaluation from well tests and production data.

Course Description:
This 5-day course will provide a comprehensive view of pressure transient test design and interpretation. The emphasis is on understanding how well and reservoir parameters of practical interest can be quantified from well tests. Well parameters causing productivity loss include near wellbore damage and limited entry; those stimulating productivity include hydraulic fracturing and well deviation, the latter including horizontal wells. Reservoir parameters include vertical and horizontal permeability, natural fractures, and reservoir boundary characterizations.

The course begins with a brief derivation of the models used for pressure transient analysis and hands on interpretation basics. The test design module describes a wide variety of test types and acquaints participants with forward simulation using commercial software providing a rich analytical model catalog. Then basic analysis is extended to include gas reservoirs and the effects of heterogeneity due to natural fractures. Next the emphasis turns to characterizing vertical and lateral reservoir limits and how the latter relates to seismic data interpretation. Then both pressure transient and production data analysis are considered for horizontal and hydraulically fractured wells. Finally, we examine multiwell and interference testing. Participants are invited to bring data for the class to consider on the last day if not before.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS.

Contact SCA for details on required software licenses

Learning Outcomes:
- Learn how well test models are derived and computed.
- Experience how to simulate pressure transient test behavior and how to design well tests.*
- Experience how to process, quality check, diagnose, and analyze pressure transient data.
- Understand the behavior of well and reservoir response patterns observed in well tests, what well and reservoir parameters can be quantified, and how to quantify them from pressure transient data.

Using commercial software (Ecrin suite by Kappa Engineering)

Participant Testimonials:
"The instructor was so energetic and consistently displayed her knowledge and experience in the field."

"I was impressed with this course and the enthusiasm and professionalism of the professor."

VISUAL ROCK CHARACTERIZATION

Instructor: Robert Merrill, PhD
Discipline: Formation Evaluation, Geoscience
Length: 5 Days
CEUs: 4.0
Availability: Private
Format: In-Person

Who Should Attend:
Geologists who desire to enhance ability to get more information from existing sample datasets, describe lithology from cuttings/cores for stratigraphic interpretation, facies mapping, reservoir characterization.

Course Description:
Information extracted from visual analysis of rock samples focuses on fundamentals of exploration/development. This data is found in existing cores, cuttings during drilling at wellsite. Information is extracted from cuttings, even those chewed up by a PDC bit. Cuttings, core description brings out details of reservoir pore systems, depositional environments, facies description, supplements/enhances modern wireline logs, aids in recognizing by-passed pays. Quantitative description has progressed from thin sections to enhanced imaging techniques. There is a role for cuttings/core description in this changing environment. Grain size, framework, fossils, color/texture distinguish subtle facies changes, subsidence patterns, regional structures. Rock description provides a tool to calibrate wireline logs to rocks for quality assurance, better interpretation, early calibration to geophysical properties. The character of matrix/accessory minerals in rock affect wireline logs, decreasing uncertainty in wireline log calculations. Shows from samples, cores exist in rock, highlighting potential pay zones.

Diagenetic changes within rock are visible in cores as well as cuttings; these changes both create/destroy porosity. The nature/amount of porosity is qualitatively described, including, not only pore types, but also pore distribution, type, amount of cement. Recognition of multiple pore types has resulted in identifying overlooked pay zones, as finest pores have higher adsorbed water percentage, larger pores will flow hydrocarbons. When dealing with unconventional reservoirs, mineralogy, hardness correlate to brittleness, fractures, microfractures are evident.
Practical applications of concepts/methods for characterizing rocks are demonstrated through exercises to reinforce key concepts. Participants are expected to independently view/describe a sequence of samples for final exercise.

Learning Outcomes:
- Understand principles of describing cuttings/cores, including important rock properties,
- Understand criteria to differentiate cavings in a cuttings sample.
- Describe clastic rocks including shale, siltstone, sandstone, components, porosity physical characteristics.
- Describe/differentiate limestone, dolomite, evaporites, physical characteristics/diagenesis.
- Describe a sequence of samples, generate a log from cuttings.

Course Content:
- Principles of cuttings, core examination with binocular microscope, including sample properties, wireline log response
- Sandstone, sandstone components, porosity, physical characteristics
- Siltstone/shale
- Carbonate classification, limestone, dolomite characteristics, diagenesis
- Fossils
- Evaporates, miscellaneous rock types
- Logging exercises

FORMATION EVALUATION COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE	Geoscience	Engineering	Unconventional	Energy Transition	Formation Eval	Multi-Disciplinary	INSTRUCTOR
Cased Hole and Production Log Evaluation		✓			✓		Barba
Pore Pressure, Fracture Pressure And Well-Bore Stability					✓		Shaker
Practical Interpretation of Open Hole Logs		✓			✓		Barba
Pressure Transient Well Test Design and Interpretation		✓			✓		Ehlig-Economides
Visual Rock Characterization	✓				✓		Merrill

Resources

10 Habits

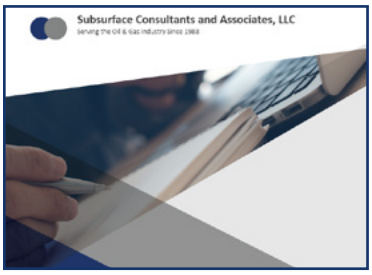
SCA's founder, Dan Tearpock, was fond of saying that it is highly trained geoscientists, not workstations, that find oil and gas. His industry best practices are summarized as the "Ten Habits of Highly Successful Oil Finders."

Webinars

We offer a library of FREE On-Demand Webinars for your viewing. Additionally, sign up for an upcoming Live Webinar. Instructors present sample material and key concepts from their SCA courses.

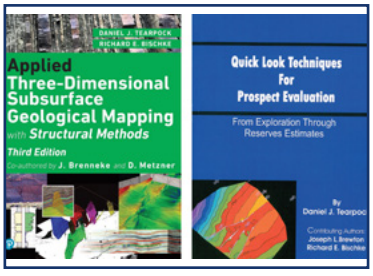
Newsletters

The geoLOGIC is a regular, free technical publication that is published several times per year. This newsletter provides technical insight on geoscience and engineering concepts and observations on trends in the oil & gas industry.



e-Brochure

Our e-Brochure provides a comprehensive look at our company history, culture, and the services that we offer. We focus on consulting and training that is current, timely, effectively formatted, and cost-efficient.



Publications

We provide technical textbooks for purchase on the subject of geological mapping and prospect evaluation: *Applied Subsurface Geological Mapping* and *Quick Look Techniques for Prospect Evaluation*.

Becoming a Consultant

SCA's e-Book, *The Next Chapter: From Employee to Independent Contractor in the Energy Industry* provides a thorough, step-by-step guide to becoming a consultant in the energy industry.

Lunch & Learn

SCA experts can deliver hour-long talks on a variety of technical topics well-suited for in-house lunch and learn presentations or society functions.

To view additional information, visit **scacompanies.com/resources**.

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Petroleum Development Oman
National Oil Company of Liberia

THE DANIEL J. TEARPOCK GEOSCIENCE CERTIFICATION PROGRAM

AKA "GEOSCIENCE BOOT CAMP"

Instructor: SCA Staff
Discipline: Multi-Disciplinary & Introductory
Length: 60 Days
CEUs: 23.2
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
This program is recommended for early career geoscientists and engineers who will benefit from a timely and cost-effective means of learning and applying geology, geophysics and engineering fundamentals in order to accelerate their contributions to exploration or development teams working in the upstream oil and gas industry.

Program Description:
This intensive 12-week training program includes six weeks of classroom courses taught by SCA's top instructors, followed by a six-week interpretation and mapping project. Participants learn fundamental interpretation, engineering, and mapping skills, and then put those skills to the test using seismic data, well logs, and production information from an actual development prospect. During the project phase, SCA engages a team of senior-level geoscientists to serve as mentors to the participants and help guide their interpretation and decision-making process. The program is designed to raise the competency level and knowledge of the participants in a short period of time.

The main objective of the program is to advance the skill level of the participants to make them contributing members of their company's exploration or development program in a minimum period of time. The combination of classroom training, mentoring, and hands-on application through a real-world project provides the participants with well-rounded knowledge of geoscience and engineering best practices.

COURSE PHASE
- Basics of the Petroleum Industry
- Elements of Energy Geology - Basin Analysis & Subsurface Energy Storage
- Basic Petroleum Economics
- Basic Petroleum Engineering for Non-Engineers
- Applied Contouring Methods Workshop
- Practical Interpretation of Open Hole Logs
- Structural Styles in Petroleum Exploration and Production
- Structural and Sequence Stratigraphy Field Course
- Applied Subsurface Geological Mapping
- Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop
- Modern Depositional Systems as Analogs for Subsurface Characterization
- Applied Seismic Interpretation
- Mapping Seismic Data Workshop

PROJECT PHASE
- Phase I: Initial Exploration – Delineate Prospects – Drill Exploration Wells
- Phase II: Assess Discovery – Refine Interpretation
- Phase III-A: Design Field Development Plan
- Phase III-B: Integrate New Directionally Drilled Well into the Interpretation
- Phase III-C: Search for Additional Prospects in and Around the Discovery
- Phase IV: Field Performance Analysis and Study
- Summary: Present Report and Project Results

BASIC PETROLEUM ECONOMICS

NEW

Instructor: Susan Howes, PE, PHR
Discipline: Multi-Disciplinary & Introductory, Engineering
Length: 1 Day
CEUs: 0.8
Availability: Public & Private
Format: In-Person

Who Should Attend:
Entry level petroleum economists, geoscientists and engineers, geoscience and engineering technicians, decision analysts, financial analysts, land managers, oil and gas accountants, and energy professionals who are engaged with building and evaluating economic models for drilling wells, capital projects, operational decisions, portfolio management, mergers, acquisitions, and divestitures.

Course Description:
Energy companies spend money exploring, appraising, and developing oil and gas fields, as well as constructing the infrastructure to produce the fields. Economics are used throughout the life cycle of the asset to provide guidance to managers who are making decisions regarding acquiring leases, gathering data about the producing formations, drilling wells, and creating an asset development plan for the field. Decisions are made regarding secondary and tertiary recovery, infill drilling, divestiture or abandonment of fields using economic models. The work of the petroleum has a significant impact on the successful efforts of the company.

Learning Outcomes:
- Fundamental concepts of cash flow from one entity to another including is it relevant, how big is it and when does it occur?
- Cash flow within the phases of the asset life cycle including exploration, appraisal, development, production, and decommissioning.
- Concession and contractual fiscal terms, production sharing contacts, royalty or production taxes, cost recovery
- Net cash flow projections, discounting, net present value (NPV), return on investment (ROI).
- Economic metrics including unit costs, margin, payback, internal rate of return (IRR), present value index (PVI) and corporate hurdle rates.
- Building discounted cash flow models.
- Incremental economics.
- Full cycle economics from exploration to abandonment.
- Decision analysis, decision trees, Swanson's rule, expected monetary value (EMV).
- Sensitivity analysis.

Course Content:
- Participants in this course will learn the basic concepts of petroleum economics. Participates will review and construct simple economic models using spreadsheets. Participants of this course will receive the Introduction to Petroleum Economics textbook (2017) and a lab manual with exercises. All students will be required to have a laptop with Excel installed. Although this is not a programming course, a proficiency with Excel is recommended.

BASIC PETROLEUM ENGINEERING FOR NON-ENGINEERS

Instructor: Susan Howes, PE, PHR
Discipline: Multi-Disciplinary & Introductory, Engineering
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, geotechs, engineering techs, landmen, attorneys, financial and accounting managers, support professionals, and other non-technical personnel who require a basic understanding of petroleum engineering.

Course Description:
This two-day course describes the main aspects of petroleum engineering with the different engineering functions of the petroleum business broken down into a discussion of each discipline, with an emphasis on what a reservoir engineer does, what data is required, where it is obtained and how it affects the analysis of the reservoir. Discussions include volumetric parameters, hydrocarbon characteristics, volumetric calculations, recovery and drive mechanisms, reservoir evaluation, the difference between resources and reserves, and the basics of economic analysis (cash flow). Some basic calculations are undertaken, but complex equations and calculations are not utilized. The course is an introduction to petroleum engineering and it is not intended to develop expertise in petroleum engineering but rather to make attendees aware of what their petroleum engineer associates do and what they need to best do their jobs.

Learning Outcomes:
- Understand the various petroleum engineering functions and how geoscientists interact with each.
- Obtain a basic knowledge of the physical properties of hydrocarbons and how they affect production.
- Gain an understanding of what occurs in the reservoir in relation to drive mechanisms and resulting recovery.
- Gain an understanding of the necessity for accurate reservoir characterization in resource/reserve calculations.
- Understand the basics of how to estimate oil/gas in place more accurately with volumetric calculations.
- Obtain a basic understanding of economic evaluation through the use of cash-flow.

Course Content:
- Petroleum engineering functions
  - Drilling Engineer
  - Completions Engineer
  - Production Engineer
  - Operations Engineer
  - Facilities Engineer
  - Reservoir Engineer
- Reserves calculation methods
- Rock and fluid parameters
- Volumetric calculations
- Recovery and drives
- Performance evaluation
- Resources / reserves
- Economics
- EOR

Participant Testimonials:
"Susan was fantastic. She gave some excellent real-world examples of how the processes we learned were applicable."

"Very knowledgeable about her field."

"Great at getting through the calculations and conveying the importance of cooperation between engineers and geologists." - Joy B.

BASIC PETROLEUM OPERATIONS

Instructor: Ruben O. Caligari
Discipline: Multi-Disciplinary & Introductory
Length: 2 Days (optional 3rd)
CEUs: 1.6
Availability: Private
Format: In-Person

(This course is available in Spanish)

Who Should Attend:
Entry-level engineers and technical personnel who will work in field operations and need to understand fundamental technologies on well drilling and completion, production operations and surface facilities. Engineers, geologists and geophysicists that need a better understanding of petroleum operations to perform in multidisciplinary teams. No previous knowledge of the subject is required.

Course Description:
The course presents the basics of reservoir properties to better understand the various drilling, completion, and production technologies. Rotary drilling principles, equipment, and operations are reviewed, as well as casing and cementing procedures. Participants will acquire basic knowledge on well completion technologies, conventional and rig-less, with emphasis on hydraulic fracturing.

Fundamentals of vertical flow in wells and artificial lift methods, field fluids conditioning and surface facilities description, and environmental aspects of operations are covered. The course approach encourages participation and discussion of field examples.

Learning Outcomes:
- Properties of oil and gas reservoirs and reservoir fluids.
- Rotary system, equipment and procedures, and well control principles for drilling for oil and gas.
- Casing and cementing, well head equipment.
- Offshore drilling technologies, directional and horizontal drilling, rig-less operations.
- Well completion operations: logging, perforating, squeeze cementing.
- Matrix and fracture stimulation, conventional and unconventional systems.
- Production equipment, artificial lift principles and methods, surface facilities.

Course Content:
- Properties of reservoir rocks and fluids.
- Pressure and temperature of reservoirs.
- Drilling principles and technologies: rotary system, drilling fluids, pressure control, drilling tools.
- Vertical and directional drilling: basic offshore technologies, casing and cementing oil wells.
- Basic operations and technologies of well completion.
- Hydraulic fracturing, principles and operations, conventional and unconventional systems.
- Vertical flow in wells and artificial lift methods.
- Production operations and field conditioning of produced fluids.
- Environmental aspects of operations.

BASIC RESERVOIR ENGINEERING FOR NON-PETROLEUM ENGINEERS

Instructor: Christine Ehlig-Economides, PhD
Discipline: Multi-Disciplinary & Introductory, Engineering
Length: 4 Days (Classroom), 8 Half-Day Sessions (Live Online)
CEUs: 3.2
Availability: Private
Format: In-Person & Live Online

Who Should Attend:
Geoscientists, landmen, attorneys, financial and accounting managers, support professionals and other non-technical personnel who require a basic understanding of petroleum engineering.

Course Description:
This four-day course describes the main aspects of reservoir engineering. Reservoir engineering has been defined as "the art of developing and producing oil and gas fluids in such a manner as to obtain a high economic recovery" (Moore, 1955). The module begins with a broad overview showing how reservoir engineers assess the value of the reservoir from volumetric, fluids, flow, and investment perspectives and contrasts conventional and unconventional resources. Next is an elaboration on how much gas or oil can be recovered from various natural conventional reservoir drive mechanisms in gas or oil reservoirs, respectively. Then is a review of unconventional gas resources, contrasting with conventional gas reservoirs, followed by a similar review for unconventional resources.

PLEASE NOTE: PARTICIPANTS ARE REQUIRED TO BRING THEIR OWN LAPTOPS.

Learning Outcomes:
- Learn how reservoir engineers assess the value of an asset.
- Learn how conventional reservoir reserves are estimated based on production and reservoir pressure data.
- Learn how unconventional resources contrast with conventional reservoirs.
- Facilitate communication between reservoir engineers and geoscientists.

Course Content:
- Overview – Assessing the Asset [general overview of key points to be covered in the course]
- Static Reservoir Description [estimation of oil and/or gas in place mainly based on log data]
- Conventional Reservoir Drive Mechanisms [estimation of oil and/or gas in place based on production data; recovery factors from primary production with or without gas cap and/or aquifer pressure support]
- Unconventional Gas/Oil Resource Engieering

Optional Course Topics [in place of above or for additional days]:
- Decline Curve Analysis [empirical models used for reserves estimation]
- Reservoir Testing [single phase single well transient flow and basic pressure buildup analysis as applied to appraisal and primary development wells]
- Flow Simulation [introduction to multiphase multiwall modeling for reservoir management]

BASICS OF THE PETROLEUM INDUSTRY

Instructor: Susan Howes, PE, PHR
Discipline: Multi-Disciplinary & Introductory
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Entry level geoscientists and engineers, as well as administrative assistants, clerks, lawyers, landmen, accountants, supervisors and managers. Also for participants coming to the oil industry from other backgrounds or industries.

Course Description:
A MUST course for new hires in the industry as well as non-technical personnel and support staff. Basics of the Petroleum Industry covers a wide variety of topics such as the generation and trapping of hydrocarbons, the nature of geophysics, and basic petroleum engineering practices. The key skills, terminology and tools involved in each discipline are highlighted, and all concepts are thoroughly illustrated with current examples. The course is well suited for both entry level geoscientists and engineers, and for more experienced, non-technical disciplines such as lawyers, accountants, administrative assistants and managers needing a "Prospect-to-Market" industry overview. Participants receive a practical understanding of how they fit into the overall industry workflow and some tools to help explain the oil and gas business to our non-industry friends. The diversity of participants adds greatly to the classroom interaction.

Learning Outcomes:
- Understand how oil and gas are formed, trapped, discovered and developed.
- Become familiar with the disciplines and skills involved in finding and producing oil and gas.
- Recognize the basic tools, equipment and processes used in finding, developing, producing and refining oil and gas.
- Understand the industry language and terminology that you are likely to encounter in your job.
- Understand the overall industry workflow from the prospect to the gas pump, and how your work fits into the big picture.

Course Content:
- Brief overview of the petroleum industry including global production, consumption and reserves.
- Petroleum geology including geologic age, plate tectonics, sedimentary basins hydrocarbon generation and migration, reservoir rock types and trapping mechanisms.
- Seismic data acquisition, processing, and interpretation.
- Exploration and development techniques and concepts.
- Drilling equipment and activities from rigs to drill bits, onshore and offshore.
- Well data acquisition (logs and cores) and integration to define reservoir parameters.
- Reservoir evaluation; including defining the limits and producibility of a reservoir.
- Basic risk concepts and economic evaluation.
- Field life cycle and production engineering systems, tools and concepts.
- Oil and gas transportation (midstream) and refining (downstream).

INTRODUCTION TO DECISION FRAMING FOR PROJECT MANAGEMENT NEW

Instructors: Ellen Coopersmith and Ryan Spence
Discipline: Multi-Disciplinary & Introductory
Length: 1 Day (Classroom), 2 Half-Day Sessions (Live Online)
CEUs: 0.8
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Project managers, team leads, development planners, economists, and professionals working major capital projects or complex decisions in their areas of responsibility.

Course Description:
This highly interactive 1-day course introduces the concept of decision quality and teaches decision framing skills to ensure that teams operate efficiently to enable informed decisions on their projects and opportunities. The goal is for attendees to become comfortable framing different types of decision problems, from the simple to the complex. Participants learn a structured workflow, thought process and toolset to take a room full of issues, with a group of people, or individually, and make perfect sense of it: define and focus the problem, identify key decisions and critical uncertainties, prioritize decisions, build viable alternative plans, qualitatively assess options, and structure the quantitative evaluation, should that be necessary to achieve clarity of action.

Learning Outcomes:
- Understand how to facilitate the development of a decision frame with key team members and decision makers.
- Develop a clear Problem Definition.
- Solicit and categorize relevant issues to identify key decisions and project risks and uncertainties.
- Define alternative strategies to consider and structure their evaluation.
- Qualitatively evaluate the options and facilitate a preliminary trade-offs discussion.
- Understand the path to develop a high-level decision roadmap.

Course Content:
- Introduction to Decision Quality
- Clear Problem Definitions
- Soliciting and categorizing relevant issues to understand the decision landscape
- Prioritizing decisions in a Decision Hierarchy
- Strategy Tables to build a menu of options and develop viable alternative plans
- Qualitatively assessing alternatives and mining for insight
- Presenting and communicating frames to leadership to support informed decision-making

INTRODUCTION TO SUBSURFACE MACHINE LEARNING

Instructor: Siddharth Misra, PhD
Discipline: Multi-Disciplinary & Introductory, Geoscience, Engineering, Unconventional Reservoirs
Length: 2 Days (Classroom), Optional Live Online Project
CEUs: 1.6
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Technical energy industry professionals (petroleum engineers, geoscientists) with basic Python proficiency.

Course Description:
This course will provide working knowledge on using python programming and open-source packages essential for data analytics and machine learning. The entire course is based on live demos of codes and workflows in the Jupyter Notebook environment. The course will help geoscientists, geophysicists, and petroleum engineers learn python programming at a beginner to intermediate level. The course uses various types of data: well logs, core data, well performance data, and production data.

The focus of this course is on introducing Python programing skills that are prerequisites to real-world data analysis. The course will not explore applications on large-sized field data. The group project lasting for 2 weeks at the end of the course will help the participants try out the learned concepts by modifying the shared Jupyter Notebooks. The practice session will allow deeper interaction with the instructor on problems specific to the participants.

Learning Outcomes:
- Assemble open-source coding and scripting workflows in Python to solve basic data science problems related to subsurface data.
- Apply numpy, pandas, matplotlib, seaborn and sklearn packages on subsurface data.
- Solve supervised regression problems using ElasticNet, random forest, nearest neighbor, and LASSO regressors.
- Solve supervised classification problems using nearest neighbor, random forest, and support vector classifiers.
- Solve unsupervised clustering problems using k-means and mean shift techniques.
- Apply anomaly detection and data preprocessing.
- Apply neural network and boosting methods.
- Learn about time-series forecasting, clustering, and spatial data analytics through two-week project.

Course Content:
- Using numpy on large arrays, using pandas on large tabular data
- Using numpy and pandas on well data for preprocessing and exploratory analysis
- Using matplotlib and seaborn on well production data for visualization
- Using sklearn for regression and classification
- Feature selection, dimensionality reduction, and feature ranking
- Using sklearn for clustering and outlier detection
- Uncertainty quantification for regressors and classifiers
- Advanced regressors and classifiers: neural network and boosting
- Optional Two-Week Project: Client can select 2 of the following 3 projects according to the needs of the participants:
  - Production Forecasting
  - Shale Image Analysis
  - Clustering the Cross-Well Seismic Traces

JUSTIFYING DATA - VALUE OF INFORMATION COURSE NEW

Instructors: Ellen Coopersmith and Ryan Spence
Discipline: Multi-Disciplinary & Introductory
Length: 3 Days (Classroom), 6 Half-Day Sessions (Live Online)
CEUs: 2.4
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Energy professionals, geoscientists, reservoir engineers, economists and managers who need to justify the collection of new data to de-risk their projects. This course is intended for those who support information acquisition decisions in exploration, appraisal, field development planning, new energy, and technology.

Course Description:
The energy industry is fraught with information decisions – from running logs, to collecting fluid or core samples in wells, to shooting seismic, to running tests, drilling appraisal wells or piloting technology. This flagship course provides foundational knowledge, practical application and tools to help teams justify information that has the potential to reduce uncertainty and make more optimum decisions on projects.

The primary goal of the course is to build true value of information (VOI) practitioner skill through the following deliverables:
- Understand how to frame and evaluate the value of data collection decisions.
- Develop forecasting skills for project uncertainties and the amount they may be reduced with new information.
- Generate uncertainty reduction plots to compare different information options and easily discuss the cost - benefit of acquiring information.

Learning Outcomes:
After the course, participants will possess the skills to answer the following questions for their projects:
- What are the main project uncertainties, and how might they play out?
- How do those uncertainties impact project decisions?
- What information might be considered to reduce those uncertainties, and how reliable is it?
- Can a business case be made for acquiring additional information?

Course Content:
- Fundamentals of valuing information.
- Introduction to a structured valuing information workflow - framing and evaluating the cost-benefit of acquiring information that impacts project decisions.
- Hands-on practice working four to six relevant, pre-defined case examples, chosen by the class participants from a large VOI case library.
- Interviewing techniques and questions to help subject matter experts forecast the uncertainty reduction potential of information they are considering.
- Hands-on practice working real information decision problems brought to class.

PETROLEUM ENGINEERING FUNDAMENTALS

Instructor: Ruben O. Caligari
Discipline: Multi-Disciplinary & Introductory, Engineering
Length: 2 Days (With Optional 3rd)
CEUs: 1.6
Availability: Private
Format: In-Person

(This course is available in Spanish)

Who Should Attend:
Entry-level technical and non-technical personnel who need an understanding of petroleum engineering principles, methods and technologies. No previous knowledge of the subject is required.

Course Description:
The concept of petroleum systems, the basic properties that control storage and flow of the fluids in the reservoir, and the relevant technologies of exploration and production of oil and gas are presented in the course.

Participants will learn about driving mechanisms, recovery factors, best practices in reservoir management, reserves definitions and the characteristics of unconventional oil and gas developments. Principles and operational aspects of drilling and completion are analyzed with emphasis in directional drilling and hydraulic fracturing. Artificial lift methods, field fluids conditioning and surface facilities, and environmental aspects of operations are included. The course approach encourages participation and discussion of field examples.

Learning Outcomes:
- Energy matrix, the role of hydrocarbons and future scenarios.
- Petroleum systems and petroleum geology.
- Petroleum reservoirs: properties, energy, pressure and fluids phases behavior.
- Unconventional oil and gas.
- Drilling and completion principles and procedures.
- Production operations and production fluids conditioning.
- Engineering and industry terminology.

Course Content:
- Global and local context of the industry
- Petroleum systems and elements of petroleum geology
- Principles and technologies of petroleum exploration
- Properties of reservoir rocks and fluids
- Types and examples of unconventional oil and gas systems
- Drilling principles and technologies
- Well completion, basic operations, hydraulic fracturing
- Artificial lift methods
- Production operations and field conditioning of produced fluids

"Learning is not attained by chance; it must be sought for with ardor and attended to with diligence."
Abigail Adams

PROJECT MANAGEMENT PROFESSIONAL EXAM PREP COURSE

Instructor: Jill Almaguer, PE, PMP
Discipline: Multi-Disciplinary & Introductory
Length: 4 Days (Classroom), 8 Half-Day Sessions (Live Online)
CEUs: 3.2
Availability: Public & Private
Format: In-Person & Live Online

Who Should Attend:
Any professional who participates in project related work as a stakeholder including project sponsor, project team member or project manager. Anyone who needs the formal education in project management to apply for the Project Management Professional certification exam.

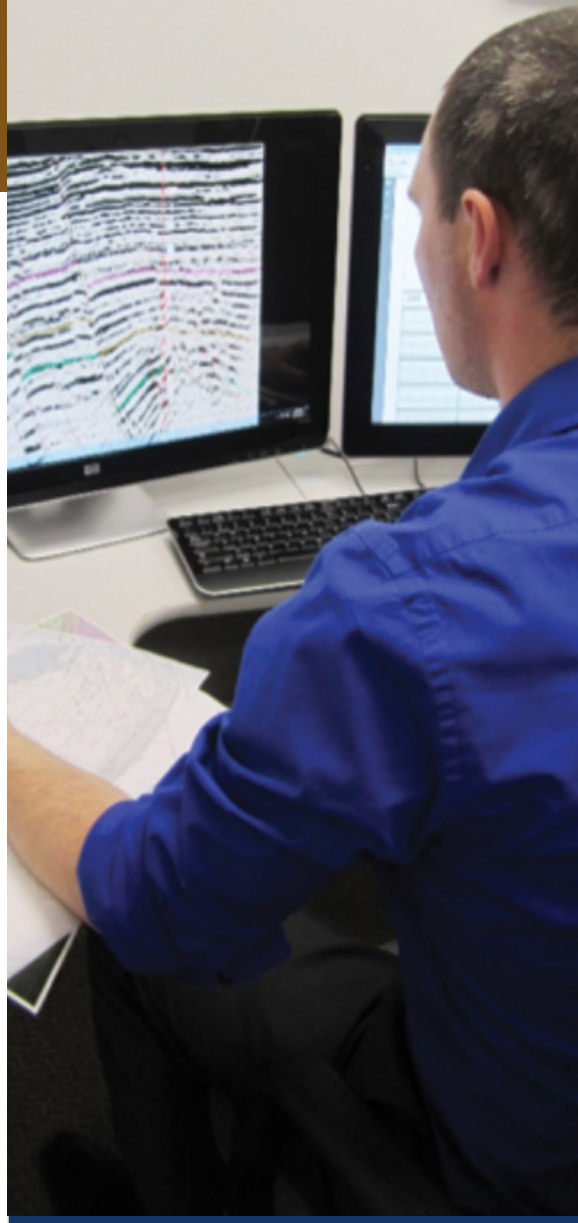
Course Description:
This course is based on *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*, published by the Project Management Institute (PMI), as a recognized standard for the project management profession. The knowledge provided in this course includes recognized best practices of project management practitioners who contributed to the standard development. The course covers key concepts in the project management field along with the processes, inputs, and outputs that are considered good practices on most projects, as well as tools and techniques used in managing projects throughout the project management life cycle. In addition, the course defines key terms and identifies external environmental and internal organizational factors that surround or influence project success.

Learning Outcomes:
- How to define project deliverables in scope and effectively manage project throughout life cycle to prevent scope creep.
- Calculation concepts and formulas to answer various types of earned value computational questions.
- Risk management and response planning to minimize impact to project.
- Stakeholder identification and analysis including managing expectations.
- Key Procurement terms, concepts and calculations including risk profiles of different types of contracts, and point of total assumption.
- Five process groups and ten knowledge areas defined in PMBOK 5th edition.
- Examples of business applications of each of the 47 project management processes.
- Meet the 35 hour PMI education requirement to apply for the PMP certification exam.

Course Content:
- Course aligned to current year's PMI Exam
- 4 Days of intense Classroom training provided by our highly qualified certified PMP trainers
- 35 Contact Hours Certificate will be given to all registrants
- Hardcopy of PMBOK5 – Accredited and approved course material
- 3 months Online Exam Simulator for exam preparation
- End-of-Chapter Quizzes & Simulation Exams
- Industry Case studies

Participant Testimonials:
"Really enjoyed this class. Jill was patient and attentive to questions. She utilized real life examples to make the material practical and relevant. She made the material enjoyable and engaged the entire class." - Reisha B.

"Jill maintained good rapport with all of the students. She had a good sense of humor while staying on topic in a professional manner. Handled questions and comments from the group with ease." - Cathy J.



"Excellence that runs deep."

This commitment extends to our all of our services also including consulting and recruitment. At all levels of our organization, we are led by years of direct, applied industry experience.

Whether for hiring decisions or strategic investments, SCA's recommendations are grounded in professional ethics, and supported by respected authorities and decision makers.

MULTI-DISCIPLINARY & INTRODUCTORY COURSES THAT FALL INTO ADDITIONAL DISCIPLINES

COURSE TITLE							INSTRUCTOR
The Daniel J. Tearpock Geoscience Certification Program ("Geoscience Boot Camp")						✓	SCA Staff
Basic Petroleum Economics						✓	Howes
Basic Petroleum Engineering for Non-Engineers		✓				✓	Howes
Basic Petroleum Operations						✓	Caligari
Basic Reservoir Engineering for Non-Petroleum Engineers		✓				✓	Ehlig-Economides
Basics of the Petroleum Industry						✓	Howes
Introduction to Decision Framing for Project Management						✓	Coopersmith & Spence
Introduction to Subsurface Machine Learning	✓	✓	✓			✓	Misra
Justifying Data - Value of Information Course						✓	Coopersmith & Spence
Petroleum Engineering Fundamentals		✓				✓	Caligari
Project Management Professional Exam Prep Course						✓	Almaguer

Geoscience | Engineering | Unconventional | Energy Transition | Formation Eval | Multi-Disciplinary

SCA & IHRDC

IHRDC is a Boston-based company that strives to accelerate workforce development through customized solutions to fit client needs. They also have offices in Houston, London, Amsterdam, Abu Dhabi, Kuala Lumpur, and Lagos.

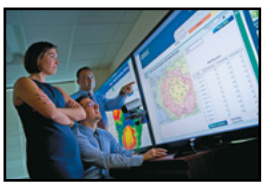
Together, **SCA and IHRDC** offer the energy industry a broad spectrum of high-quality training content and effective blended learning delivery options that can be customized to fit the needs of our clients. We have agreed to initiate cross-marketing and selling of our respective services.

IHRDC's e-Learning and Knowledge Solutions

Innovative learning resources that offer accelerated, low cost, effective, and on-demand learning devoted to all functional areas of the international oil and gas industry.

IHRDC's Competency Management

Industry-leading competency and compliance products and services that lead to a fully competent workforce.



IHRDC's Instructional Programs

Outstanding programs that teach management and petroleum business essentials using challenging business games.

info@scacompanies.com
(713)789-2444

BASIN-FLOOR FAN SYSTEMS (SOUTH CENTRAL PYRENEES, SPAIN)

Instructor: Steve Cossey, PhD
Discipline: Field Courses
Length: 5 Days
CEUs: 4.0
Availability: Private

Who Should Attend:
Geologists, geophysicists, members of deepwater study teams (engineers, team leaders and project managers), as well as mid-level to upper-level managers needing to learn more about deep-marine systems, architecture, elements, reservoir properties and their explanation and production characteristics.

Course Description:
This field course is designed for explorationists, non-geoscience members of a synergistic team and managers interested in developing an understanding of deep-marine foreland basin-floor fan systems. From seismic-scale to bed-scale, the architecture, elements and reservoir characteristics of well-exposed deep-marine channelized fan systems are studied in the South Pyrenean foreland basin which is associated with synsedimentary tectonics.

The importance of seafloor topography in controlling fan sedimentation, as well as the evaluation and significance of sediment-slide/debris flow fan system complexity is studied. In evaluating deep-marine processes, environments and systems, you will learn how to consider their application to hydrocarbon exploration and production.

Course Content:
- Deep-marine processes, environments and systems
- Seismic-scale to bed-scale exposure
- Architecture, elements and reservoir characteristics of well-exposed deep-marine fan systems
- Relationship between tectonics and sedimentation
- Overview of Ainsa Drilling Project: results and applicability
- Application of deep-marine models to hydrocarbon exploration and production
- Overview of South Pyrenean foreland: basin tectonics, structure and stratigraphy
- Evaluation of thin-bedded turbidites as potential reservoir intervals
- Production from thin-bedded turbidites
- Sheet vs. lobe deposits
- Confinement of turbidite systems
- Twelve different locations visited

"An organization's ability to learn, and translate that learning into action rapidly, is the ultimate competitive advantage."
Jack Welch

BIG BEND FIELD COURSE (SOUTHWEST TEXAS)

Instructor: Eric D. Carlson, PG
Discipline: Field Courses
Length: 2 Days
CEUs: 1.6
Availability: Private

Who Should Attend:
Engineers, landmen, managers, and salesmen will take away mental images from outcrops that will help them to understand Oilpatch geology. For geoscientists, walking in and around seismic line-sized outcrops and canyons will spur new ideas and constrain existing models.

Course Description:
Big Bend is unique. It is the only place in North America where all the major types of oilfield trapping mechanisms are easily identified. Four types of mountain-building, and deposition of sandstone and carbonates are the results of continental drift and heat flow in the Earth's crust. Engineers, Landmen, Managers, and Salesmen will take away mental images from outcrops that will help them to understand Oilpatch geology. For Geoscientists, walking in and around seismic line-sized outcrops and canyons will spur new ideas and constrain existing models.

Students will receive three guidebooks and two large maps, and an orientation webinar before the trip. The tectonics and history of the park will be discussed. Each of the two days in the park will feature five hours of contact with the rocks. Outcrops are near the road. At outcrops, analogues to conventional and unconventional reservoirs will be noted. Structural analogues include the US Gulf Coast, the Oklahoma STACK Play, the Permian Basin, foreland basins of the Rockies, the Cantarell Complex, and the North Sea. Stratigraphic analogues are Gulf Coast turbidites, Cretaceous foreland sandstones, Morrow Sands, swamps, Gulf Coast Edwards and Austin Chalk plays, and giant reservoirs in the Persian Gulf. In four 1.5-mile roundtrip hikes, the trip will visit all major ecosystems of Big Bend National Park: Riverine, Desert Floor, Scrub Forest, and Chisos Rim. Nine other roadside stops will complete the course. Participants will begin each day from accommodations north of the park and return after dark. The field course size is limited to 25 attendees.

Learning Outcomes:
- Normal faults, reverse faults, and strike-slip faults will be observed at a distance and close-up, to discern major and subtle details which affect hydrocarbon trapping and well placement.
- Three types of fluvial sand bars, caused by differing bed loads and stream gradients, will be observed to help imagine their thicknesses and lateral geometries underground as reservoirs. Fossil riverbeds having scour surfaces and near-vertical walls will be seen in cross-section.
- Deepwater chert (novaculite) hogbacks and adjacent fractured black shale will be studied for their prospectivity. Flash flood channels will be compared to turbidites and submarine canyons in outcrop.
- Massive-bedded and thin-bedded limestone and marl will be examined for factors influencing horizontal and vertical permeability and fracture density. Subsurface conventional and unconventional reservoir analogues will be discussed.
- Outcrops of shale that were deposited in deep marine, shelf margin, and subaerial environments will be diagnosed by their color, plasticity, silt content, and hydrocarbon-generating/preserving abilities. Dinosaur localities will be noted. Subsurface reservoir analogues will be discussed.

WE PRACTICE WHAT WE TEACH

Our instructors are experts in their fields and still actively engaged in their areas of specialization.

Many of our instructors have served as consultants on various SCA projects as contracted by major oil and gas companies domestically and internationally.

CARBONATE RESERVOIRS OF THE PERMIAN BASIN NW SHELF (WEST TEXAS) NEW

Instructor: Lansing Taylor, PhD
Discipline: Field Courses
Length: 4 Days
CEUs: 3.2
Availability: Public & Private

Who Should Attend:
This course is intended for geologists exploring and developing carbonate reservoirs in the Permian Basin. Interested geophysicists and reservoir engineers will also benefit. A master's degree in geology or equivalent experience is required.

Course Description:
This four-day field course explores stratigraphic and structural controls on the occurrence of reservoirs in Paleozoic carbonate rocks on the NW Shelf of the Permian Basin. Primary reservoirs are associated with depositional facies like shoals, reefs, channels, fans, and mounds. Secondary reservoirs are produced by diagenetic process, karst, and natural fractures. The distribution of both primary and secondary features are controlled by location in the basin, which in turn depends on both sea level and the structural form of the basin.

Each day of the course has a theme related to the distribution and formation of reservoirs. Day 1 is about climate and sea level and the stacking of facies. Day 2 is about tectonics and deformation and process that localize facies and create secondary reservoirs. Day 3 is the detailed Wolfcamp through Guadalupe sequence stratigraphy. This is the outcrop section time-equivalent to the key subsurface reservoir section. It's not the same facies but it is the same ocean and correlations into the subsurface are robust. Day 4 is the famous Permian Reef Geology Trail at Guadalupe Mountains National Park. Obviously, that day is all about reefs. Over the four days of the course, we will walk the entire stratigraphic section sequentially from basement through top Permian.

Learning Outcomes:
- Walk the entire Paleozoic stratigraphic section of the NW Shelf.
- View strata in outcrop that are time-equivalent to key producing intervals in the subsurface.
- Identify major sequence boundaries in Wolfcamp through Guadalupe section.
- Recognize primary and secondary carbonate reservoir types in outcrop.
- Understand key differences between greenhouse and icehouse stratigraphy.
- Understand fundamental principles of tectono-stratigraphy.
- Understand the tectonic evolution and timing of the Permian Basin.
- Identify the characteristic patterns of natural fractures present in outcrop.

Course Description:
- Day 1: Cambrian through Carboniferous Reservoirs: Greenhouse vs. Icehouse
- Day 2: Tectono-Stratigraphy, La Luz Anticline: Analog to the Central Basin Platform
- Day 3: Sequence Stratigraphy of the Permian Section, Wolfcamp to Bell Canyon
- Day 4: Permian Reef Geology Trail

DEEPWATER JACKFORK FIELD COURSE (ARKANSAS – OKLAHOMA)

Instructor: Lesli J Wood, PhD
Discipline: Field Courses
Length: 3 Days (Also Available in 5-Day Format Upon Request)
CEUs: 2.4
Availability: Private

Who Should Attend:
Exploration and development geologists, engineers, geophysicists and managers desiring hands-on experience in recognition of deepwater reservoirs, and who want to learn frameworks and methodologies for exploring for, and managing these reservoirs in the subsurface, as well as modelers who want to compare and contrast different architectures in different types of deepwater basins.

Course Description:
This field course examines the various submarine gravity deposits (deepwater valleys/canyons, channels, channelized and non-channelized lobes, mass failures, injectites, etc.) in an up-dip to down-dip depositional profile of Jackfork Group (Pennsylvanian) strata across the Morrowan Ouachita Basin of Arkansas. The five-day trip visits outcrops of submarine slope canyon fill, submarine slope and basin channel fill, basin floor sheet sandstones and rare leveed-channel complexes. Outcrops are seen in remarkable dam and quarry exposures. In one area, a 3-D geologic model has been completed and this outcrop has undergone reservoir simulation using the Eclipse™ modeling software. At each outcrop, measured stratigraphic sections, outcrop gamma ray logs and (in some cases) ground-penetrating radar examples are provided, which tie outcrop observations to analog subsurface reservoir features. Unique depositional features and inferred processes are discussed. The Jackfork Group is widely considered to be an outcrop analog to many deepwater (turbidite) reservoirs worldwide. We will show some direct scaling to the Wilcox of the Gulf of Mexico.

Course Agenda:
- Day 0: Arrive in Little Rock.
  Afternoon lectures covering deepwater systems, the Pennsylvanian paleogeography of the area and the overall structural setting of the Pennsylvanian period, and the structural evolution of the Ouachita Mountains.
- Day 1: Updip Slope Facies Tract
  Visit the facies, facies associations and architectural elements that comprise the updip slope depositional systems of the Jackfork deepwater system.
  - Stop 1.1 McCain Mall
  - Stop 1.2 Big Rock Quarry
  - Stop 1.3 Pinnacle Mountain State Park
  - Stop 1.4 Olistolithic Deposits of the Jackfork Slope, Maumelle Lake
- Day 2: Downdip Basinal Facies Tract
  - Examine gamma logs and lithologic logs, correlations between large cyclic packages, and place these within a sequence stratigraphic framework.
  - Stop 2.1 McCain Mall
  - Stop 2.2 DeGray Spillway
  - Stop 2.3 Dam Outflow
- Day 3: Mid-Fan Architecture and Reservoir Modeling
  - Stop 3.1 Hollywood Quarry
  - Stop 3.2 Baumgartner Quarry
  - Stop 3.3 Dierks Spillway

DEEPWATER JACKFORK AND ATOKA FIELD COURSE (ARKANSAS – OKLAHOMA) NEW

Instructor: Lesli J Wood, PhD
Discipline: Field Courses
Length: 5 Days
CEUs: 4.0
Availability: Private

Who Should Attend:
Exploration and development geologists, engineers, geophysicists and managers desiring hands-on experience in recognition of deepwater reservoirs, and who want to learn frameworks and methodologies for exploring for, and managing these reservoirs in the subsurface, as well as modelers who want to compare and contrast different architectures in different types of deepwater basins.

Course Description:
This field course examines the various submarine gravity deposits (deepwater valleys/canyons, channels, channelized and non-channelized lobes, mass failures, injectites, etc.) in an up-dip to down-dip depositional profile of Jackfork Group (Pennsylvanian) strata across the Morrowan Ouachita Basin of Arkansas. The five-day trip visits outcrops of submarine slope canyon fill, submarine slope and basin channel fill, basin floor sheet sandstones and rare leveed-channel complexes. Outcrops are seen in remarkable dam and quarry exposures. In one area, a 3-D geologic model has been completed and this outcrop has undergone reservoir simulation using the Eclipse™ modeling software.

Measured stratigraphic sections, outcrop gamma ray logs, and (in some cases) ground-penetrating radar examples are provided at each outcrop. This data ties outcrop observations to analog subsurface reservoir features. Unique depositional features and inferred processes are discussed. The Jackfork Group is widely considered to be an outcrop analog to many deepwater (turbidite) reservoirs worldwide. We will show some direct scaling to the Wilcox of the Gulf of Mexico. On day five, students will contrast Jackfork deposits with the deepwater deposits of the wedge-top basins of the Atoka Fm.

Course Agenda:
- Day 0: Arrive in Little Rock.
  Afternoon lectures
- Day 1: Updip Slope Facies Tract
  Visit the facies, facies associations and architectural elements that comprise the updip slope depositional systems of the Jackfork deepwater system.
  - Stop 1.1 McCain Mall
  - Stop 1.2 Big Rock Quarry
  - Stop 1.3 Pinnacle Mountain State Park
  - Stop 1.4 Olistolithic Deposits of the Jackfork Slope, Maumelle Lake
- Day 2: Downdip Basinal Facies Tract
  - Examine gamma logs and lithologic logs, correlations between large cyclic packages, and place these within a sequence stratigraphic framework.
  - Stop 2.1 Hwy 7 Roadcut Near Lake DeGray
  - Stop 2.2 DeGray Spillway
  - Stop 2.3 Dam Outflow
- Day 3: Mid-Fan Architecture and Reservoir Modeling
  - Stop 3.1 Hollywood Quarry
  - Stop 3.2 Baumgartner Quarry
  - Stop 3.3 Dierks Spillway
- Day 4: Core Workshop and Lecture: Distal Fan Deposits
- Day 5: Deepwater Fans and Shelf Systems of the Rapidly Subsiding Arkoma Basin: Atoka Formation
  - Stop 5.1 Perryville, Deepwater Atokan Age Fan Deposits
  - Stop 5.2 Atokan Shelf-Edge Deltas or Sharp-Based Shorefaces? You Decide!

DEEPWATER SYSTEMS, AINSA BASIN, SPANISH PYRENEES: APPLICATION TO HYDROCARBON PROSPECTIVITY AND UNCONVENTIONAL PLAYS

Instructor: Kevin Pickering, PhD and Steve Cossey, PhD
Discipline: Field Courses
Length: 5 Days
CEUs: 4.0
Availability: Public & Private

Who Should Attend:
Geologists, geophysicists, members of unconventional reservoirs study teams (engineers, team leaders and project managers), as well as mid-level to upper-level managers needing to learn more about petroleum systems, architecture, elements, reservoir properties and their explanation and production characteristics.

Learning Outcomes:
- Improve knowledge and understanding of deepwater depositional processes.
- Learn necessary terminology so that engineers and geologists can communicate effectively.
- Learn appreciation for reservoir and architectural element scale, dimensions and connectivity.
- Understand deep water architectural element variability away from the wellbore.
- Relate features that are observed in core to 3D features in the subsurface.

Course Description:
- Day 1: Barcelona
- Day 2: Barcelona to Ainsa
  - Orientation, introduction to Ainsa Basin (middle Eocene deep-marine sediments) and its tectonic context within the Pyrenean orogen
- Day 3: Ainsa Basin - Submarine channel
  - Dos Rios - UCL Core Laboratory to view Well Ainsa 6 core drilled behind the Ainsa Quarry face
  - Viewpoint of seismic-scale submarine channel outcrops from across Rio Cinca (Ainsa II Fan)
  - Ainsa Quarry - look at spectacular outcrops with a large range of sedimentary facies and depositional architecture
  - Forcaz Stream, Ainsa II sandbody (fan) and associated thin-bedded deposits
- Day 4: Ainsa Basin - submarine channel and related deposits
  - Morillo and Guaso sandbodies (fans)
  - Arro channelized sandy fan along the road from Arro to Los Molinos
  - Charo Canyon (feeder system for Arro Fan)
  - Formigales shelf-margin deposits
  - Gerbe II sandy fan deposits at Gerbe (axial-channel to channel-margin deposits)
- Day 5: Jaca Basin - submarine lobes and related deposits
  - Broto waterfall outcrops in submarine lobe and deposits
  - Megaturbidites (Cotefablo) and basin-floor deposits
  - Fanlo lobe and related deposits
- Day 6: Ainsa Basin - deep-marine systems
  - Rio Sieste, Morillo System MTDs and sandy fan lateral-accretion packages (LAPs)
  - Mass transport deposits (MTDs) and channelized sandstones, Morillo I sandy fan
- Day 7: Ainsa to Barcelona

Participant Testimonial:
"By far one of the best courses I've taken. Well planned, thought-through, with very knowledgeable instructors. This course has changed the way I approach interpretations. It will also help when communicating with drilling and completions engineers on reservoir performance and possible heterogeneity not captured on logs and seismic data."

HIGH-CONTINUITY SANDY TURBIDITE SYSTEM: APPLICATION TO HYDROCARBON PROSPECTIVITY (FRANCE)

Instructor: Kevin Pickering, PhD and Steve Cossey, PhD
Discipline: Field Courses
Length: 5 Days
CEUs: 4.0
Availability: Public & Private

Who Should Attend:
This course is relevant to all subsurface geoscientists and engineers who wish to broaden their knowledge of sandy turbidite (deepwater) systems and deep marine clastic plays. Participants will achieve a broad working knowledge of these systems as applied to hydrocarbon prospectivity.

Course Description:
- Arrive in Nice, France
- Day 1: Orientation, St. Antonin aree
  - Stop 1 - St. Antonin
- Day 2: Coulomp Valley near Annot
  - Stop 2a - Coulomp Valley Overview
  - Stop 2b - Coulomp Valley - St. Benolt Fault Zone
  - Stop 2c - Coulomp Valley - Braux onlap
  - Stop 3 - Annot town, Les Scaffarels
- Day 3: Montagne de Chalufy
  - Stop 4 - Chalufy Mountain
  - Stop 5 - Annot road section
- Day 4: Peira Cava area
  - Stop 6a - Peira Cava overlook
  - Stop 6b - Peira Cava log A.
  - Stop 6c - Peira Cava log B
- Day 5: Contes area
  - Stop 6d - Base log A
  - Stop 6e - Shepherd's farmhouse
  - Stop 7 - Barre des Alpes

Learning Outcomes:
- Seismic-scale to individual bed-scale appreciation of the architecture and elements of a well-exposed deep-marine high-continuity sandy system which accumulated mainly in a pre-existing and topographically-complex sub-basins associated with some syn-sedimentary tectonics.
- Relationship between tectonics and sedimentation.
- Onlap relationships associated with sandy turbidite systems. Onlaps are important in turbidite reservoirs as they may provide either stratigraphic seals or leakage. The field course involves an evaluation of field examples of onlaps. Hydrocarbon analogs and prospectivity.
- To consider applicability of depositional model/s for the Paleogene of Southern France to areas of hydrocarbon exploration and production. The Paleogene provides direct analogs for the complex slope basins of the Gulf of Mexico.
- Process sedimentology. Training course in deep-marine processes, including the issue of turbidites versus debrites, structureless ("massive") sands.

MODERN COASTAL SYSTEMS OF TEXAS FIELD COURSE (GALVESTON, TEXAS)

Instructor: Julia Smith Wellner, PhD
Discipline: Field Courses
Length: 1 Day
CEUs: 0.8
Availability: Private

Who Should Attend:
Exploration and development geologists, engineers, geophysicists and managers desiring hands-on clastic depositional systems experience.

Course Description:
Sea level has fluctuated across the Texas continental shelf and coastline throughout time. What does this mean for the rivers and coastal deposits of Texas? The processes shaping our rivers and beaches essentially were the same in the past as they are today, but where we find the deposits from ancient bays and beaches and rivers has changed. Other geologic processes, such as sediment movement, also influence the deposits.

This intensive 1-day field course examines the processes that influence deposition and change in these different environments and then map older deposits carefully to reconstruct the geologic history of the Texas coast. Participants will understand the distribution of the deposits and the processes that formed and changed them helps petroleum industry geologists better predict where oil and gas may form, move, and be found along the Texas coast and in the Gulf of Mexico.

Course Content:
- Stop #1 Brazos River
- Stop #2 New Brazos Delta and Beaches
- Stop #3 Old Brazos River Delta at Surfside Beach
- Stop #4 San Luis Pass
- Stop #5 Galveston Island Beach
- Stop #6 Galveston Island Sea Wall End

Participant Testimonial:
"The instructor was very knowledgeable and effective at communicating the course material."

"Train people well enough so they can leave; treat them well enough so they don't want to."
Richard Branson

MODERN DEPOSITIONAL SYSTEMS AS ANALOGS FOR SUBSURFACE CHARACTERIZATION FIELD COURSE (GALVESTON, TEXAS) NEW

Instructor: Mark Olson
Discipline: Field Courses
Length: 1 Day
CEUs: 0.8
Availability: Public & Private

Who Should Attend:
Entry level geoscientists and engineers working in the subsurface characterization of fluvial and clastic shallow marine depositional environments.

Course Description:
Geoscientists and engineers are responsible for characterizing the subsurface and often, with limited datasets. The use of analogs is critical for understanding the geologic variability that can and does occur.

The Texas Gulf Coast provides an excellent modern analog for fluvial and shallow marine reservoirs in the subsurface. Modern analogs provide spatial context for the arial geometry and variability that occurs within their respective depositional environments. This course will provide participants with a hands-on experience to understand how depositional environments and processes influence geometries and preservation potential of these systems to aid in their characterization in the subsurface as aquifers, reservoirs, and storage for carbon capture.

Learning Outcomes:
- Introduction to fluvial/shallow marine processes, depositional environments and preservation potential.
- Spatial understanding of geometries for these depositional systems as they relate to subsurface characterization.
- Fundamental concepts of facies and their impact on reservoir quality, distribution and volumetric calculations.

Course Content:
- Stop 1: Brazos River Fluvial Processes, Facies and Depositional Systems
- Stop 2: Brazos Delta Wave Dominated Processes, Facies and Geometries.
- Stop 3: San Luis Pass Tidal Inlet and Flood Tidal Delta Processes, Facies and Geometries.
- Stop 4: Galveston Barrier Island Processes, Facies and Geometries.

FEATURED INSTRUCTOR:

W. Lansing Taylor, PhD

W. Lansing 'Lans' Taylor, PhD is a consulting structural geologist based in Salt Lake City, Utah. Dr. Taylor holds a Ph.D. in Quantitative Structural Geology, Neotectonics, and Geomechanics from the Rock Fracture Project at Stanford University. His thesis 'Fluid Flow and Chemical Alteration in Fractured Sandstone' integrated structural geology, hydrology, and geochemisty to document subsurface fluid flow pathways.

Dr. Taylor spent 20 years in Houston, TX, where he held full time positions at Anadarko Petroleum and Talisman Energy. He worked primarily as a subject matter expert in Structural Geology with forays into conventional exploration, development and management roles. He also worked as an independent consultant including major projects with Chesapeake Energy, Schlumberger, and the structural consultancy IGEOSS. More recently, he served as Advisor to the Director at the Energy and Geoscience Institute at the University of Utah.

Dr. Taylor has explored petroleum systems globally and possesses a comprehensive knowledge of the tectonic environments and structural styles present on Earth. Dr Taylor leads multiple field courses in the United States studying both areas of industry activity and exceptional examples of characteristic structural forms.

Courses Taught:
- Carbonate Reservoirs of the Permian Basin NW Shelf
- Structural and Sequence Stratigraphic Field Course (Hill Country, TX)
- Structural Styles and Tectono-Stratigraphy for the Mid-Continent
- Structural Styles in Petroleum Exploration and Production

STRUCTURAL AND SEQUENCE STRATIGRAPHIC FIELD COURSE (HILL COUNTRY, TEXAS)

Instructor: Lansing Taylor, PhD
Discipline: Field Courses
Length: 2 Days
CEUs: 1.6
Availability: Public & Private

Who Should Attend:
Geologists, geophysicists, engineers, managers, and technicians who wish to develop a better understanding of rock formations (structure and stratigraphy) and how they relate to the everyday work in exploration, development, and production.

Course Description:
This field training course focuses on upper Cretaceous carbonates exposed on the Llano uplift. These formations are productive for oil and gas in the subsurface. Subsurface accumulations are discussed on analog outcrops of the actual reservoirs where participants can directly observe how depositional and structural features interact to create hydrocarbon reservoirs.

The trip begins near San Antonio where the Glen Rose, Edwards, and Austin Chalk formations are dissected by the Balcones Fault system providing several excellent fault exposures. The course then moves towards Johnson City and the central portion of the Llano uplift. Several stops illustrate a major unconformity between the Pennsylvanian and the lower Cretaceous and discussion shifts to depositional systems and sequence stratigraphy. The field component concludes with stops near Austin looking at fracture systems and their dependence on lithology in the upper Cretaceous.

During the field trip, the instructor discusses the petroleum systems of Texas, the deposition and stratigraphy of Pennsylvanian and Cretaceous sediments, and the characterization of faults and fractures in the carbonate rocks. Participants are encouraged to think about what outcrop-scale features look like in the subsurface data such as seismic or well logs, and to think about how such information can be used to infer reservoir behavior across a wide range of scales.

STRUCTURAL STYLES AND TECTONO-STRATIGRAPHY FOR THE MID-CONTINENT (OKLAHOMA - TEXAS) NEW

Instructor: Lansing Taylor, PhD
Discipline: Field Courses
Length: 4 Days
CEUs: 3.2
Availability: Public & Private

Who Should Attend:
This course is intended for geologists, geophysicists, and reservoir engineers exploring and developing hydrocarbons in the mid-continent region including the Arkoma, Anadarko, Fort Worth and Permian Basins. The course aims to highlight connections between tectonics, structure, sedimentation, and stratigraphy. As such, broad familiarity with common geologic concepts is expected.

Course Description:
The mid-continent region includes the Arkoma, Anadarko, and Fort Worth Basins. While the Permian Basin is often discussed as its own province, it is contemporaneous with the other mid-continent basins, shares many structural and stratigraphic similarities, and is discussed in this course as part of the mid-continent system. The region has a complex structural history with compelling evidence of extension, strike slip, both thin- and thick-skinned contraction, as well as gravitational collapse. Karst and fractures are common across the region. Conveniently, all of these structural styles are exposed in southern Oklahoma and parts of the adjacent prairie in Texas. In places, the stratigraphy is well exposed and the entire Paleozoic section can be observed in outcrop. While facies and formations vary with large distance, the fundamental tectonic evolution of this field area and the impact of deformation on contemporaneous sedimentation here is representative of what happens across this multi-state area.

This course aims to provide a coherent overview of the structure and stratigraphy of this multi-basin region. We will view in outcrop the entire stratigraphic section from basement through Pennsylvanian. We will see in outcrop examples of all major structural styles except for salt tectonics. We will be able to document the timing of basin formation and the associated response of the sedimentary system to active deformation. We will view conventional carbonate and clastic reservoir rocks as well as the Woodford unconventional reservoir.

Learning Outcomes:
- Introduction to the major tectonic elements of the mid-continent region.
- Introduction to the Paleozoic stratigraphy of the mid-continent region.
- View conventional reservoir rock in carbonate and clastic units.
- View unconventional reservoirs in mudstone and fractured basement.
- Receive a comprehensive overview of major structural styles including extension, contraction, inversion, strike slip, and gravity-sliding; and see examples of each in outcrop.

Course Description:
- Day 1: Wichita Wildlife Refuge: Basement and its Discontinuities
- Day 2: Arbuckle Mountains: Inversion of the Paleozoic Carbonate Platform
- Day 3: Ouachita Mountains: Fluvial Response to The Allegheny Orogeny
- Day 4: Palo Pinto Hills: Growth Faulting on the Pennsylvanian Shore

FEATURED INSTRUCTOR:

William Little, PhD

William Little, PhD has extensive experience teaching university courses in sedimentary geology and geological mapping. He also has over 15 years conducting geological mapping. He received a Doctorate in geology from the University of Colorado-Boulder and MS and BS degrees in geology from Brigham Young University.

Dr. Little has held various roles in academia, including as a professor at Brigham Young University – Idaho, the University of Missouri – Rolla, Drury University, Moberly Area Community College, and Front Range Community College. At BYU – Idaho, he teaches sedimentology and stratigraphy with heavy emphases on recognition of ancient depositional systems and sequence stratigraphy, along with geomorphology. He is also the field camp director. He previously taught graduate courses in advanced geological mapping at UM – Rolla and worked as a mapping geologist for the Missouri Geological Survey.

Field Course Taught:
- The Book Cliffs, Utah: A Case Study in Coastal Sequence Stratigraphy

THE BOOK CLIFFS, UTAH: A CASE STUDY IN COASTAL SEQUENCE STRATIGRAPHY

Instructor: William Little, PhD
Discipline: Field Courses
Length: 5 Days
CEUs: 4.0
Availability: Private

Who Should Attend:
This course is designed for petroleum geologists, geophysicists, and engineers who have a basic understanding of depositional systems and stratigraphic principles but desire a stronger working knowledge of sequence stratigraphy, based on a hands-on field experience.

Course Description:
The Book Cliffs of Utah have become the premier locality globally for field teaching of sequence stratigraphy. Continuous, well-exposed and easily-accessible outcrops make it possible to analyze facies relationships of stratigraphic sequences in great detail, both in terms of lateral variation (systems tracts) and vertical stacking patterns (parasequences). Most significant clastic depositional systems are represented, including meandering, braided, and anastomosed fluvial; fluvially and wave-dominated deltas; transgressive and regressive shorefaces, tidally-dominated estuaries, and deepwater mudstones. This makes the Book Cliffs an excellent classroom to study the interrelationship between eustatic and tectonic development of accommodation space and subsequent filling by clastic sediment.

The Book Cliffs region is often cited as an analog for subsurface exploration, particularly in foreland basins, and sequence stratigraphy has become one of the leading methods for correlating and mapping depositional packages, leading to significant discoveries of petroleum in fields that had been abandoned, as well as new discoveries. To that end, this course is directly applicable to the exploration, characterization, simulation, and development of petroleum reservoirs. Specifically, this course gives participants an opportunity to view sequence stratigraphic features directly in outcrop, giving a better perspective when making similar interpretations based on cores, logs, and seismic sections. This course would be particularly valuable to geologists who have had limited exposure to real rock bodies.

The course runs five days, with a format consisting of early morning instructional sessions at the hotel, followed by further instruction and completion of exercises in the field, and ending with post-dinner summary sessions at the hotel.

Course Content:
- Day 1: General principles and concepts of sequence stratigraphy; introduction to the stratigraphy and setting of the Book Cliffs (Price River Canyon)
- Day 2: Concept of a systems tract; relationship between facies, facies associations, and depositional environments/ systems – including river-dominated deltas, progradational beaches, and barrier islands (Gentile Wash and Spring Canyon)
- Day 3: Concept, identification, and significance of parasequences and stacking patterns; incised valley fill tidally-influenced estuarine) deposits (Coal Creek, Soldier, and Woodside Canyons)
- Day 4: Reservoir-scale down-dip facies changes; facies mapping (architectural analysis) of a complete sequence (Battleship Butte to Thompson Canyon)
- Day 5: Core analysis (Utah Geological Survey – Salt Lake City)

INSTRUCTOR BIOGRAPHIES

SCA's training instructors are experts in their respective fields and eager to share their knowledge. They are an integral part of the superior SCA training experience.

SIAMAK AGAH

Sia Agah is a petroleum geologist and an Associate with SCA in Houston. He holds a M.A. in Petroleum Geology from the University of London. Sia was with the National Iranian Oil Co. (NIOC) in Tehran for 13 years working as a geologist, a wellsite geologist, a senior geologist, and a geological advisor until he joined Conoco in 1979. With Conoco he worked as a Senior Geologist, Chief Geologist, Exploration Manager, and New Ventures Vice President until 1997. He worked respectively in Houston, Tunisia, Angola, and the UAE (Dubai). After early retirement in 1997, Sia moved to UMC/Ocean Energy to set up and manage their South Asia - Middle East Exploration Department while managing seven exploration blocks in Pakistan, Bangladesh, and Yemen. Sia has an extensive knowledge of the petroleum geology of the Middle East, South Asia, North Africa, and Offshore West Africa, and Brazil.

Courses taught:
- *Applied Contouring Methods Workshop* (p 14)
- *Applied Subsurface Geological Mapping* (p 15)

JILL B. ALMAGUER, PE, MBA, PMP

Jill Almaguer is a certified Project Management Professional (PMP) and Registered Professional Engineer in Texas. She provides leadership and project management to coordinate suppliers to deliver contract requirements on time and on budget while meeting or exceeding customer expectations for quality results.

While working at HP for 20 years, she led a number of technical project teams implementing a broad range of projects from $10 million of medical electronics for the new Brooke Army Medical Center built in San Antonio to nationwide high-speed telecommunications network monitoring systems. At HP, she taught quality process improvement methods to over 600 employees in the southern US as part of the Voice of the Customer project implementation. Almaguer also provided project management and consulting services to clients such as BP Gulf of Mexico division for a major ERP conversion project. She has presented at numerous national and regional conferences for Society of Women Engineers and Project Management Institute. Jill has a BS in Bioengineering and an MBA and currently serves on the board of the Federation of Houston Professional Women, and Texas A&M University Biomedical Engineering Industry advisory board. She is current chairman of the Biomedical Engineering Society Houston Industry Chapter and past president of Association of IT Professionals in Houston.

Course taught:
- *Project Management Professional Exam Prep Course* (p 56)

EWERTON ARAUJO, PHD

Dr. Ewerton Araujo is a Managing Partner of Subsurface Alliance with 20 years of experience in the oil and gas industry as a geomechanics specialist. He has worked over 100 projects in many different countries in Latin America, USA, Canada, Middle East and West Africa, and Australia in both onshore and offshore fields. He received his BSc in Civil Engineering from the Universidade Federal de Paraiba and his MSc and PhD in Civil Engineering from the Pontificia Universidade Catolica de Rio de Janeiro.

Courses taught:
- *Geomechanics Aspects of CCS Projects* (p 46)
- *Geomechanics for Geothermal Projects* (p 46)

ROBERT BARBA

Bob has over 40 years of practical experience in the petroleum industry as an openhole wireline engineer, product development manager, petrophysicist, and completion optimization advisor. His primary focus is the integration of petrophysics with completion and reservoir engineering to maximize well recovery factors. He has extensive experience in both conventional and organic shale reservoirs. Bob received the Regional Formation Evaluation Award from the Society of Petroleum Engineers Southwest North America region (Permian Basin) in May of 2018. He served as a Distinguished Lecturer 1995-1996 for the Society of Petroleum Engineers on the optimization of completion designs using petrophysical and reservoir engineering inputs. He was one of 130 nominees for the 2024-35 tour as well.

Bob is a recognized industry authority on refrac candidate selection and refrac "best practices." His articles have been published in Oil and Gas Investor, American Oil and Gas Reporter, Oil and Gas Journal, and the Journal of Petroleum Technology. Bob served as an expert witness on log derived rock properties for BP in the Macondo trial. He pioneered techniques to evaluate well performance using production data and routine well log data and has applied the concept to over 5,000 wells to date. Most recent projects involve documenting refrac reorientation (URTeC paper 3724057) and documenting parent-child damage (SPE paper 212371).

Courses taught:
- *"Best Practices" for New Well Fracs and Legacy Well Refracs* (p 40)
- *Cased Hole and Production Log Evaluation* (p 49)
- *Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects* (p 47)
- *Practical Interpretation of Open Hole Logs* (p 50)

JIM BRENNEKE

James (Jim) Brenneke graduated from Augustana College with a BA in Geology and an MS in Geology from the University of Illinois. He joined Shell Oil Company (US) and worked for various Shell subsidiaries in research, international exploration and domestic exploration and production. He then joined Subsurface Consultants and Associates, LLC (SCA) as a consulting geoscientist. In addition to consulting, he assumed various management roles with SCA including Technical Manager, Vice President of Geology & Engineering and Treasurer. He then joined BP's deepwater Gulf of Mexico (GoM) Production organization.

Jim has an extensive range of experience. He has worked in the onshore and offshore U.S. and in numerous foreign countries. He has contributed to numerous exploration discoveries, field extensions and development wells in his 40 years in the industry. He has published on deep sea carbonates and on assessing fault traps. Jim teaches our Applied Subsurface Geological Mapping course.

Course taught:
- *Applied Subsurface Geological Mapping* (p 15)
- *Quality Assurance/Quality Control Skills for Subsurface Mapping (QAQC)* (p 20)

RUBEN CALIGARI

Rubén Caligari has more than 35 years of experience in engineering and operations in E&P. His most recent corporate position was Sr. Technical Advisor in unconventional resources with Petrobras Argentina E&P. During his career, he led multidisciplinary teams in project evaluations, field developing, and mature fields revitalizations in Argentina and several Latin American countries. He has been active in unconventional resources projects in Argentina.

Retired from activities, he is currently professor of Petroleum Engineering at Instituto Tecnologico de Buenos Aires, teaching courses on energy in other universities in Argentina, and participating in Industry and Government initiatives on Education on Energy.Ruben is author and director of the online course on Petroleum Engineering Basics presented by Instituto Argentino del Petroleo y del Gas. He has been an active SPE member, serving as officer in different positions including President Patagonia Section, President Argentine Petroleum Section and Regional Director for LA&C, 2008-2011. Mr. Caligari was named as a Distinguished Member of SPE in 2020.

Courses taught (also offered in Spanish):
- *Basic Petroleum Operations* (p 54)
- *Petroleum Engineering Fundamentals* (p 56)
- *Unconventional Oil and Gas* (p 43)

ERIC D. CARLSON, PG

Eric worked with Marathon Oil Company, CDS Oil and Gas Group plc, and LCS Production Company, and has consulted for several Independents and PEMEX. He has an 82% drilling success record, including a 97% success rate during 2015 – 2020. Eric has worked in 12 offshore and onshore US Basins, including more than 5 years in the offshore Gulf of Mexico and 4 basins in Latin America. He is a subtle pay specialist who has helped reverse production declines in the Permian Basin, the Gulf of Mexico, and onshore Mexico. He has helped develop conventional reservoirs with infill drilling, waterfloods, tertiary recovery programs and horizontal drilling.

Eric's experience includes preparing reserve EUR's and lease valuations in tight sands and unconventional shale plays (Permian Basin, Hardeman Basin, San Juan Basin, and Latin America). He has done unconventional exploration in Latin America and the US. Eric's Wellsite Supervision experience includes more than 25 offshore logging jobs and 200 Permian Basin logging jobs (12 wireline companies, 15 mudlogging companies). He has performed more than 600 e-log evaluations in unconventional zones and several thousand pay counts in conventional reservoirs. Eric

earned a BA/Honors in Geoscience (1982) from Cornell University. He is a licensed geologist in the State of Texas: License Number 5258. He is a member of the AAPG and other professional associations.

Course taught:
- *Big Bend Field Course* (p 58)

GARY CHAPMAN

Gary has been associated with SCA since 2007. He is an oil and gas geoscience professional with wide-ranging expertise in international and domestic exploration and development projects. His strengths are in international and domestic exploration and exploitation, primarily focused on petroleum resource evaluations of new business opportunities and unconventional resources. He has a B.S and M.S. of Petroleum Geology from the University of Arkansas. Mr. Chapman is experienced with play and basin studies, geochemical interpretation and drilling operations. He conducts exploration and development evaluations to define new business ventures and opportunities, supervises exploration and development projects and asset evaluations and ensures the achievement of company objectives by following projects from inception to completion. He has visited and conducted exploration activities in ~30 countries and emirates.

Program taught:
- *The Daniel J. Tearpock Geoscience Certification Program* (p 30, 53)

ALAN CHERRY

Alan Cherry is a Senior Geoscientist with over 34 years of industry experience. He has been associated with SCA since 2005 as one of the company's principal geoscience consultants. His integrated skill set includes 2D and 3D geophysical interpretation, exploration play analysis and prospect generation, field development, reservoir engineering, formation evaluation, economic assessment, reserves evaluation, drilling, completion, and production operations. He is highly proficient in the use of multiple geologic and seismic interpretation tools. His areas of expertise include Offshore GOM, Texas Gulf Coast, South Louisiana, East Texas, Permian, Uinta - Piceance, Williston, North Slope, Cook Inlet, and onshore California. Internationally he has worked projects in Ukraine, Russia, Indonesia, North Sea, Senegal, Nigeria, Gabon, Tanzania, Morocco, Somalia, Iran, Qatar, Thailand, South China Sea, Ecuador, Venezuela, Argentina, and Colombia. Alan received his BS in Geology at State University of New York and did his graduate studies at the University of Houston and Wright State University. He is a Licensed Professional Geologist in Texas and a Certified Professional Geologist in Indiana.

Courses taught:
- *Mapping Seismic Data Workshop* (p 19)
- *Well Tie Workshop* (p 25)

RAJAN N. CHOKSHI, PhD

Dr. Rajan Chokshi works as an artificial lift and production 'Optimizer' for Accutant Solutions. He has over 36 years of experience working with a national oil company, research consortia, consulting and software firms, and a service company in various roles: engineer, software developer, project manager, trainer, consultant, and senior business leader.

Rajan has worked on global projects in multiphase flow, artificial lift, production optimization, data analysis with real-time production monitoring. He has co-authored over fifteen SPE papers and holds two US patents. He has served on the SPE training and global production award committees and several technical committees for the SPE ATCE and artificial lift conferences. He has co-chaired an SPE artificial lift workshop, an SPE forum on production issues in unconventional, and an SPE multiphase flow metering workshop. He was an SPE Distinguished Lecturer twice for the 2015-2016 and 2018-2019 years. Dr. Chokshi holds a Bachelor's and Master's in chemical engineering from the Gujarat University and IIT-Kanpur, India; and a Ph.D. in Petroleum Engineering from the University of Tulsa, USA.

Courses taught:
- *Artificial Lift and Production Optimization Solutions* (p 32)
- *Artificial Lift and Real-Time Optimization for Unconventional Assets* (p 40)
- *Data Analytics Workflows for Artificial Lift, Production, and Facility Engineers* (p 33)
- *Gas-Lift & Deliquification Applications* (p 35)
- *Producing Unconventional with Gas Lift – From Annular to PAGL to Plunger Lift and In-Between* (p 37)

ELLEN COOPERSMITH

Ellen is the founder of Decision Frameworks and has been with the company since its formation in 1999. She has a Petroleum Engineering degree from the Colorado School of Mines and specializes in Decision Analysis consultation, facilitation, training, and implementation. Prior to forming the company, Ellen led one of the oil industry's most successful implementations of Decision & Risk Analysis for Conoco, which led to her passion for Decision Science skill development, framing, uncertainty analysis and valuing information.

Ellen is a published author and invited speaker on both the implementation and the technical aspects of Decision Analysis. She has served as the President of the Society of Decision Professionals (SDP), is an SDP Fellow and registered professional engineer.

Courses taught:
- *Introduction to Decision Framing for Project Management* (p 55)
- *Justifying Data - Value of Information Course* (p 55)

STEVE COSSEY, PhD

Dr. Cossey has over 30 years of global E & P experience with a specialty and expertise in deepwater clastics. He has explored in frontier areas of the United States as well as China, Dubai, East Africa, Guyana, Indonesia, Malaysia, Mexico, Morocco, Spain and Tunisia. Steve has also worked on numerous Gulf of Mexico lease sales, prospects, developments and farm-ins. In 1990, he helped start a deepwater research program at BP Research in Sunbury, UK. Many E&P companies use his deepwater field, reservoir and outcrop databases and attend his classroom and field seminars. Dr. Cossey is skilled in interpreting deepwater sequences and creating sequence stratigraphic and depositional models from core, well and seismic data. He has worked with over 100 companies that are exploring the deepwater globally and is fairly fluent in Spanish and French. Steve earned his Ph.D. in Geology from the University of South Carolina, Columbia.

Courses taught:
- *Basin-Floor Fan Systems (South-Central Pyrenees, Spain)* (p 58)
- *Deepwater Systems, Ainsa Basin, Spanish Pyrenees: Application to Hydrocarbon Prospectivity and Unconventional Plays* (p 60)
- *High-Continuity Sandy Turbidite System: Application to Hydrocarbon Prospectivity (SE France)* (p 60)

BIROL DINDORUK, PHD

Birol Dindoruk, PhD is currently AADE Endowed Professor of Petroleum Engineering at University of Houston. Previously he was the Chief Scientist of Reservoir Physics and the Principal Technical Expert of Reservoir Engineering in Shell. His technical contributions have been acknowledged with many awards during his career, including SPE Honorary Member Award (2023), SPE Lester C. Uren Award (2014), SPE Cedric K. Ferguson Medal (1994), and SPE Distinguished Membership. Birol is well-known for his extensive work on thermodynamics of phase behavior/EOS development and experimental work, interaction of phase behavior and flow in porous media, EOR and CO_2 sequestration, and correlative methodologies. Dr. Dindoruk has also been working in the area of data analytics, artificial intelligence, and machine learning and focusing on effective incorporation of data sciences into the oil and natural gas industry practices and energy systems.

He has authored/co-authored various articles for hydrogen, geothermal systems and adsorptive storage. Dr. Dindoruk holds a BSc degree in petroleum engineering from Technical University of Istanbul, MSc degree in petroleum engineering from The University of Alabama, a PhD degree from Stanford University in petroleum engineering and mathematics, and an MBA from University of Houston.

Course taught:
- *Geothermal Energy* (p 47)

DENNIS DRIA, PhD

Dr. Dennis Dria has over 40 years of experience in the oil & gas industry, including 9 years with the Standard Oil Company and 21 years with Shell, in a combination of upstream and downstream oil and gas R&D and E&P operating division positions. At the time he left Shell in 2010, he was a Staff Research Engineer working in the areas of fiber-optic technology development, fiber-optic data management and integration and technology implementation for well and reservoir monitoring. Prior to this he was Engineering Advisor for Shell's Global Implementation Team for Reservoir Surveillance Technologies during which he identified appropriate in-well monitoring technologies for Shell "top 70" global development projects, resulting in field surveillance

plans for more than 20 major E&P projects. He also was Shell's Global Subject Matter Expert (SME) for Production Logging and Permanent Sensing and SME for Mud Logging, and had formation evaluation and well logging (open-hole and cased-hole) assignments that included planning, vendor selection, operations, interpretation and field studies.

Dr. Dria received a BS in Physics and Mathematics from Ashland University and a PhD in Petroleum Engineering from the University of Texas at Austin.

Course taught:
- *In-Well Fiber-Optic Sensing* (p 35)

CHRISTINE EHLIG-ECONOMIDES, PhD

Dr. Ehlig-Economides is currently professor of petroleum engineering at the University of Houston & the Hugh Roy and Lillian Cranz Cullen Distinguished University Chair. Dr. Ehlig-Economides worked for Schlumberger for 20 years in a truly global capacity. She has published more than 60 papers and has authored 2 patents, and has lectured or consulted in more than 30 countries. Dr. Ehlig-Economides is internationally recognized for expertise in reservoir engineering, pressure transient analysis, integrated reservoir characterization, complex well design, and production enhancement.

Her involvement includes: Executive Editor of the Society of Petroleum Engineers Formation Evaluation journal 1995-96; SPE Distinguished Lecture 1997-98; and numerous posts as chairman or member of SPE committees and task forces. She was the Program Chairperson for the 2006 SPE Annual Technical Conference and Exhibition. In 2018, she was selected as an SPE Honorary Member. She is a member of the National Academy of Engineering, recipient of the John Franklin Carll Award, The Anthony F Lucas Medal, and the Lester C Uren Award, and on NRC Board on Energy and Environmental Systems (BEES). She was elected as a Fellow in the National Academy of Inventors in 2023. Christine received a BA degree in Math-Science from Rice, an MS degree in Chemical Engineering from the University of Kansas, and a PhD degree in Petroleum Engineering from Stanford University.

Courses taught:
- *Basic Reservoir Engineering for Non-Petroleum Engineers* (p 54)
- *Carbon Capture Utilization and Storage - An Engineering Perspective* (p 45)
- *Pressure Transient Test Design and Implementation* (p 50)

FERMIN FERNANDEZ-IBAÑEZ, PHD

Dr. Fermin Fernandez-Ibañez is a Managing Partner of Subsurface Alliance with 20 years of experience as a geoscientist in development, production, operations, and research & technology. His experience includes carbonate reservoir characterization and modeling and performance prediction. Fermin is an expert in natural fractures, karst related excess permeability, structural geology, and geomechanics (wellbore stability, pore pressure, rock mechanics). He has experience mentoring and developing technical competencies in junior geoscientists. Dr. Fernandez-Ibañez received his BSc in Geology and PhD in Geology and Geophysics both from the Universidad de Granada.

Courses taught:
- *Geomechanics Aspects of CCS Projects* (p 48)
- *Geomechanics for Geothermal Projects* (p 48)

JAMES W. GRANATH, PhD

Dr. James W. Granath is a consulting structural geologist based in Denver, Colorado, who has worked in academia as well as minerals and petroleum exploration. Since 1976 he has taught at SUNY Stony Brook and spent 18 years in Conoco in research, international exploration, and new ventures. In 1999 he opened a consulting practice focused on structural geology and tectonics as applied to exploration problems, interrupted only by brief periods with Forest Oil and Midland Valley Exploration in Denver. He is a member of AAPG, AGU, GSA, and RMAG, and a certified petroleum geologist. He is the author of numerous research papers and co-edited several multi-author compendia.

His expertise lies in seismic interpretation and integration with structural analysis, fracture analysis, regional synthesis, and prospect and play evaluation. Research interests include intraplate block faulted terrains, both extensional and compressional, regional tectonics of Africa, and the Kurdistan thrust belt. He has a PhD from Monash University in Australia, and a BS and MS from of University of Illinois at Champaign-Urbana. Jim serves on the Graduate Faculty at the University of Alabama, Tuscaloosa.

Course taught:
- *Structural Geology & Tectonics as Applied to Upstream Problems* (p 24)

LAURIE GREEN, MSc, PG

Laurie has extensive international and domestic experience as a geophysical interpreter, geomodeler, and project manager in conventional and unconventional assets for both E&P and service companies. She has broad expertise in computer-based mapping and modeling systems as an interpreter, programmer, and technical training. She has performed integrated field studies for global clients using different software systems and understands how computer-generated maps can be used and misused in real-world projects. Laurie's career started in the early 1980's with Conoco in the Permian Basin, developing prospects in the Ouachita Overthrust, Midland Basin and Northwest Shelf of New Mexico. After roles as a geophysicist and computer programmer, she joined a Houston-based international consultancy where she developed expertise in geological modeling for field development projects in the Middle East, Mexico, South America, and Africa.

Laurie worked as an expat in Russia and Malaysia with Halliburton before returning to Houston with Hess Corporation where she held roles as a technical professional and manager before retiring in January of 2018. Laurie received her BS in Geological Sciences from Cornell University and her MSc from the University of California at Santa Cruz. She is a registered Professional Geoscientist in the state of Texas.

Course taught:
- *Principles of Mapping with Petrel©* (p 19, 28)

URSULA HAMMES, PhD

Dr. Ursula Hammes is an adjunct professor in the Department of Geological Sciences at The University of Texas at Austin teaching and assessing various shale oil/gas systems. Dr. Hammes has 20+ years of experience in the O&G industry and academia in Europe and USA in positions ranging from exploration, development, research and management. She has provided advanced consulting in shale-gas/oil systems and has taught industry short courses and in-house training courses for oil companies. Dr. Hammes obtained her Diploma at the University of Erlangen, Germany, and her Ph.D. at the University of Colorado at Boulder. Her graduate studies specialized in carbonate depositional environments, sequence stratigraphy, carbonate diagenesis, and rock-water interactions.

Her background ranges from exploration, exploitation and business development for Anadarko Petroleum, consulting for Marathon Oil, Statoil, and various other independent oil/gas companies, conducting research in Texas and the Gulf of Mexico. Dr. Hammes served as president of the Gulf Coast Section of SEPM (GCSSEPM), currently assists as associate editor for the AAPG Bulletin, and has been chair of many AAPG conventions and sessions. She serves as shale liquids and gas committee chair for EMD. She has published extensively in recognized sedimentologic and petroleum industry professional journals and is an expert in mudrock/shale analyses from basin to nanoscale sequence stratigraphy of carbonates and siliciclastics.

Courses taught:
- *Shale Reservoir Core Workshop: Sedimentologic and Stratigraphic Assessment of Organic-Rich Mudrocks* (p 42)
- *Shale Reservoir Workshop: Analyzing Organic-Rich Mudrocks from Basin to Nano-Scale* (p 42)

DIMITRIOS HATZIGNATIOU, PhD

Dimitrios G. Hatzignatiou, PhD is Professor in Petroleum Engineering at University of Houston. He holds a PhD degree in petroleum engineering from the University of Tulsa, and has over 30 years of combined academic and industry experience having taught at four universities, worked in various technical and management positions with a major service company, and consulted with the oil & gas and energy industries. He joined the Petroleum Engineering faculty at University of Houston in 2016 after serving for twelve years as Chief Technical Director and Center of Oil Recovery (COREC) Professor in Norway.

He has developed and managed several applied and research projects related to Carbon Capture Utilization and Storage (CCUS) and Carbon Capture and Storage (CCS) both in Europe and USA. He was a European Association of Engineers and Geoscientists (EAGE) CCS lecturer, and served as chairman of the 2015 EAGE International Workshop on CCS. Dr. Hatzignatiou has organized and served on several SPE Technical Committees, is an Associate Editor of the SPE Reservoir Engineering journals, and is serving as reviewer in numerous scientific journals.

Courses taught:
- *Carbon Capture Utilization and Storage - An Engineering Perspective* (p 45)
- *Fundamentals of CO_2 Sequestration: Mechanisms and Processes* (p 46)

SUSAN HOWES, PE, PHR

C. Susan Howes is President at Subsurface Consultants & Associates LLC, and she served as SCA Vice President of Engineering from 2016 to 2022. Howes' prior experience includes roles of increasing responsibility at Anadarko and Chevron in reservoir engineering, business development, corporate engineering, HR, organizational capability and reservoir management. Howes is recognized an industry leader in petro-technical talent attraction, development and retention. She has coauthored numerous papers and articles on the topics of ethics, uncertainty management, risk management, and talent management. Howes currently serves on the Colorado School of Mines Petroleum Engineering Department Program Advisory Board, chairs the US Advisory Council for the Society of Petroleum Engineers (SPE) and chairs the SPE Management Technical Section. Howes received the SPE DeGolyer Distinguished Service Medal, is an Honorary Member of SPE, and served as a SPE Distinguished Lecturer for 2019-20. Howes holds a BS degree in Petroleum Engineering from the University of Texas..

Courses taught:
- *Basic Petroleum Economics* (p 53)
- *Basic Petroleum Engineering for Non-Engineers* (p 53)
- *Basics of the Petroleum Industry* (p 54)

JERRY JENSEN, PhD

Dr. Jensen is a part-time research engineer at the Bureau of Economic Geology, University of Texas at Austin. From 2007 to 2018, he held the Schulich Chair in Geostatistics at the University of Calgary's Department of Chemical and Petroleum Engineering. Prior to 2007, Jerry held faculty positions at Texas A&M (1998-2007) and Heriot-Watt (1985-1997) Universities and worked as a field engineer for Services Techniques Schlumberger (1973-1977) and Gearhart Industries (1977-1983).

Jensen has taught industry short courses on geomechanics, well log interpretation, geological statistics, reservoir characterization, and petrophysics. Jensen received a BSc in electrical engineering from the U. of Birmingham (UK) in 1973 and a PhD degree in petroleum engineering from the U. of Texas at Austin in 1986. He is author or co-author of over 100 publications, including the books "Statistics for Petroleum Engineers and Geoscientists" (2000, Elsevier) and "Applied Reservoir Engineering and Characterization (2014, Gulf). He has research and teaching interests in inter-well connectivity, petrophysical analysis of unconventional reservoirs, and strategic sampling for reservoir analysis and modeling. Jerry was an SPE distinguished lecturer in 2011-2012 on the topic of inter-well connectivity.

Course taught:
- *Managing Mature Oilfields with Capacitance-Resistance Modelling* (p 36)

SHAH KABIR

Shah Kabir is an adjunct faculty member at the University of Houston and is the proprietor of CS Kabir Consulting. He has 40 years of experience in the oil and gas industry, with stints at Dome, Arco, Schlumberger, Chevron, and Hess. He has published more than 140 papers and two books, and contributed to SPE Transient Well Testing. He was an SPE Distinguished Lecturer in 2006–2007 and has been involved in several SPE peer-reviewed journals, serving as an associate editor of SPE Production and Operations, an associate editor and technical editor of SPE Reservoir Evaluation and Engineering, and a technical editor of SPE Journal. He chaired three SPE Forum Series from 2010 to 2012 and is an editor of the SPE textbook Pressure Transient Testing. Kabir received the SPE Reservoir Description and Dynamics Award in 2010, an SPE Distinguished Membership Award in 2008, and is an SPE Honorary Member. Shah holds a bachelor's degree and a master's degree in chemical engineering from the Bangladesh University of Engineering and Technology at Dhaka, and a master's degree in chemical engineering with petroleum engineering specialization from the University of Calgary.

Course taught:
- *Reservoir Management of Unconventional Reservoirs: From Inception to Maturity* (p 41)

WILLIAM N. KREBS, PhD

William N. Krebs graduated with a B.S. in Geology from the University of California at Los Angeles and received his Ph.D. in Geology from the University of California at Davis. He is currently a geoscience consultant who specializes in the use of biostratigraphic data for well and regional correlations, paleoenvironmental analysis, depositional and basin modeling, and for sequence stratigraphy and chronostratigraphy. He has over 30 years of experience in the petroleum industry as a technical worker, manager, mentor, and instructor for Amoco Production Co., the Energy and Geoscience Institute (EGI) of the University of Utah, and for Petronas Carigali (Kuala Lumpur, Malaysia). He has field work experience in North and South America, Africa, and Asia, and has led field trips and taught seminars in the US and Egypt. He has also written and published numerous technical papers on the application of microfossils to stratigraphic research.

Course taught:
- *Applied Biostratigraphy in Oil and Gas Exploration and Production* (p 14)

LARRY W. LAKE, PhD

Dr. Larry W. Lake is a professor in the Department of Petroleum and Geosystems Engineering at The University of Texas at Austin where he holds the Shahid and Sharon Ullah Chair. He holds B.S.E and Ph.D. degrees in Chemical Engineering from Arizona State University and Rice University, respectively.

Dr. Lake is the author or co-author of more than 100 technical papers, four textbooks and the editor of three bound volumes. He has served on the Board of Directors for the Society of Petroleum Engineers (SPE), won the 1996 Anthony F. Lucas Gold Medal of the AIME, the Degoyer Distinguished Service Award in 2002, and has been a member of the National Academy of Engineers since 1997. He won the SPE/DOE IOR Pioneer Award in 2000.

Course taught:
- *Managing Mature Oilfields with Capacitance-Resistance Modelling* (p 36)

W. JOHN LEE, PhD

Dr. Lee is known throughout the world as a leader in petroleum reservoir engineering. Author of two textbooks published by SPE on Well Testing and Gas Reservoir Engineering, Dr. Lee holds the L.F. Peterson Chair in Petroleum Engineering at Texas A&M University. After receiving BChE, MS, and PhD degrees from Georgia Tech, Dr. Lee worked for the reservoir studies division of Exxon Production Research Company from 1962 to 1968. Later he joined and eventually headed Exxon Company, US's major fields study group where he supervised integrated field studies of Exxon's largest domestic reservoirs. He joined S.A. Holditch & Associates, Inc. in 1980 and retired as a vice president in 1999.

Dr. Lee is a past member of the Board of Directors of SPE, an SPE Honorary Member, has been a Distinguished Lecturer, has received the Distinguished Faculty Achievement Award, and is a Continuing Education Lecturer. He received the John Franklin Carll Award in 1995, the Distinguished Service Award in 1992, and the Reservoir Engineering Award in 1986. He was named a Distinguished Member in 1987. Dr. Lee was also elected to the National Academy of Engineering in 1993 and to Georgia Tech's first class of its Academy of Distinguished Engineering Alumni in 1994.

Courses taught:
- *PRMS and SEC Reserves and Resources Regulations* (p 37)
- *Production Forecasting for Low Permeability Reservoirs* (p 38)
- *Reserves Estimation* (p 38)

WILLIAM LITTLE, PhD

Dr. William Little has over 15 years of experience teaching university courses in sedimentary geology and geological mapping and 16 years conducting geological mapping. He received a Doctorate in geology from the University of Colorado-Boulder and MS and BS degrees in geology from Brigham Young University.

Dr. Little has held various roles in academia, currently as a professor at Brigham Young University – Idaho and previously at the University of Missouri – Rolla, Drury University, Moberly Area Community College, and Front Range Community College. At BYU – Idaho, he teaches sedimentology and stratigraphy with heavy emphases on recognition of ancient depositional systems and sequence stratigraphy, along with geomorphology and is the field camp director. He previously taught graduate courses in advanced geological mapping at UM – Rolla and worked as a mapping geologist for the Missouri Geological Survey.

Course taught:
- *The Book Cliffs, Utah: A Case Study in Coastal Sequence Stratigraphy* (p 62)

SILVIU LIVESCU, PHD

Dr. Silviu Livescu joined the Petroleum and Geosystems Engineering Department at the University of Texas at Austin in September 2021, after a successful technical career with Baker Hughes and ExxonMobil, authoring 38 US patents and patent applications and more than 90 papers and articles. Dr. Livescu is a distinguished member, a former distinguished lecturer, and the 2020-2023 Data Science and Engineering Analytics (DSEA) technical director of SPE, and the editor-in-chief for Geoenergy Science and Engineering (formerly the Journal of Petroleum Science and Engineering, the most cited oil, petroleum, and natural gas journal on Google Scholar).

Dr. LIvescu was a lead author of the "Future of Geothermal in Texas" report, and has introduced the first geothermal engineering class at the University of Texas at Austin, with outstanding feedback from his students. Dr. Livescu holds BS and MSc degrees from the University "Politecnica" of Bucharest, Romania, a PhD degree in mechanical engineering from the University of Delaware and was a postdoctoral research fellow in the Energy Resources Engineering Department at Stanford University.

Course taught:
- *Geothermal Energy* (p 47)

OSCAR LOPEZ-GAMUNDI, PhD

Dr. Oscar Lopez-Gamundi has close to 30 years of worldwide experience in pathfinding, play trend definition, prospect generation and execution. He has extensive expertise in onshore and offshore exploration in areas including Latin America, Gulf of Mexico, and Africa. He served on a part-time basis as an Assistant Professor in Sedimentology at the University of Buenos Aires where he had previously received both his Bachelor's degree equivalent and PhD in Geology. The bulk of his career was then spent holding various high-level positions with Texaco, Chevron, and Hess.

He has instructed various industry courses, given convention presentations, and has more than 100 publications on sedimentology, basin analysis, and oil and gas exploration. He is also fluent in English, Spanish, and Portuguese. Drawing from his wide-ranging experience in the industry and academia, Dr. Lopez-Gamundi instructs a five-day course for SCA entitled "Carbonate Sedimentology and Sequence Stratigraphy". The objective of the course is to provide course participants with the tools and methodologies to effectively predict the pressure and quality of reservoir, source rock and seal.

Courses taught:
- *Carbonate Sedimentology and Sequence Stratigraphy* (p 16)
- *Sequence Stratigraphy Applied to Oil & Gas Exploration* (p 23)

D. NATHAN MEEHAN, PhD, PE

Dr. D. Nathan Meehan is President of CMG Petroleum Consulting, an energy advisory firm founded in 2001 and Senior Technology Advisor for Petro.ai, a leading oilfield data analytics firm where he advises on energy transition issues. He was formerly President of Gaffney, Cline & Associates, and a senior executive at Baker Hughes, Occidental Petroleum and Union Pacific Resources. He served as the 2016 President of the Society of Petroleum Engineers.

Dr. Meehan holds a BSc in Physics from the Georgia Institute of Technology, an MSc in Petroleum Engineering from the University of Oklahoma, and a PhD in Petroleum Engineering from Stanford University. He is an SPE Honorary Member and the recipient of the World Oil Lifetime Achievement Award and Petroleum Economist magazine's Legacy Award. He served as Chairman of the Board of the CMG Reservoir Simulation Foundation and twice as a Director of the Computer Modelling Group, Ltd., as Director of Vanyoganeft Oil Company, as Director of Pinnacle Technologies, Inc., as a Director of the Society of Petroleum Engineers and as a Director of JOA Oil & Gas BV. Nathan also serves on the boards of the University of Oklahoma Board of Visitors for the Mewbourne College of Earth and Energy, the University of Texas and Saint Frances University petroleum engineering departments and the Georgia Institute of Technology College of Sciences. He is an appointed member of the Interstate Oil & Gas Compact Commission, has served on the National Petroleum Council and is a widely published author. Nathan was named to the National Academy of Engineering in recognition of technical and business innovation in the application of horizontal well technology for oil and gas production. Dr. Meehan is a licensed professional engineer in four states.

Course taught:
- *Energy Transition for Petroleum Professionals* (p 45)

ROBERT MERRILL, PhD

Dr. Merrill has over 30 years of industry experience. He has explored a variety of basins, including extensional basins, fold and thrust belts and foreland basins both from a regional context as well as prospect generation. Geographic areas outside North America in which he has both exploration and acquisition experience include Argentina, Brazil, Colombia, Thailand, Malaysia, Indonesia, Russia, Kazakhstan, Azerbaijan, the North Sea, and Central Europe. Robert has experience generating and evaluating prospects in both conventional and unconventional clastic reservoirs, including fractured reservoirs, tight gas sands, and carbonates. He has taught in-house courses on a range of subjects including structural geology, basin analysis and plate tectonics, and geology for engineers. Dr. Merrill has served as Secretary and President of the American Institute of Professional Geologists and is active in AAPG. He has also published papers on risk analysis, deep and overpressured gas in the Green River Basin, and origin and migration of oils in Wyoming/Utah/Idaho Overthrust belt. He is a Fellow of the Geological Society of America, a Chartered Geologist with the Geological Society and has served on committees for the American Geological Institute. Dr. Merrill has his Ph.D. and M.S. from Arizona State University and his B.A. in Geology from Colby College.

Course taught:
- *Visual Rock Characterization* (p 50)

HAL F. MILLER

Hal Miller is the Chairman of Subsurface Consultants & Associates, LLC's Board of Directors after serving as President for 10 years. During that time, he was responsible for managing SCA's global operations and guiding the company's strategic direction. Prior to joining SCA in 2004 as Vice President of Operations, Hal spent a total of 26 years working at Conoco and ConocoPhillips. He held a variety of positions including operations, exploration, and human resource management at the business unit level, and corporate level skills management for the geoscience and reservoir engineering disciplines. Hal received his undergraduate degree in 1974 from Williams College in Massachusetts and his M.S. in Geology from the University of Colorado, where he serves on the Department of Geosciences Advisory Board, in 1979.

Course taught:
- *Basics of the Petroleum Industry* (p 54)

JENNIFER L. MISKIMINS, PhD

Dr. Jennifer L. Miskimins serves as the Department Head of the Petroleum Engineering Department at the Colorado School of Mines and holds the F.H. Mick Merelli/Cimarex Energy Distinguished Department Head Chair. Dr. Miskimins holds BS, MS, and PhD degrees in Petroleum Engineering and has over 25 years of experience in the petroleum industry. She has work experience with Marathon Oil Company in a variety of locations as a production engineer and supervisor. Dr. Miskimins started teaching at CSM in 2002 and was a full-time professor until 2013 when she returned to the industry. She continued to hold a part-time appointment at CSM, advising research and graduate students, while working for Barree & Associates. In 2016, she returned full-time to the university. Jennifer specializes in well completions, stimulation, hydraulic fracturing, and associated production issues. She is the founder and current Director of the Fracturing, Acidizing, Stimulation Technology (FAST) Consortium and also co-directs the Center for Earth Materials, Mechanics, and Characterization (CEMMC). Her research interests focus on the optimization of stimulation treatments and the importance of such on associated recovery efficiencies. Dr. Miskimins is currently the Completions Technical Director on the SPE International Board of Directors. She was an SPE Distinguished Lecturer in 2010-2011 and 2013-2014 on hydraulic fracturing in unconventional reservoirs. She was also awarded the 2022 Distinguished Achievement Award for Petroleum Engineering Faculty and the 2023 Distinguished Member Award by the Society of Petroleum Engineers (SPE).

Course taught:
- *Hydraulic Fracturing: Theory & Application* (p 41)

SIDDHARTH MISRA, PhD

Prof. Siddharth Misra is an Associate Professor in Harold Vance Department of Petroleum Engineering with a joint appointment in the Department of Geology and Geophysics at Texas A&M University. He is a researcher and educator in the field of subsurface monitoring for the exploration and production of subsurface earth resources. He authored two books: "Machine Learning for Subsurface Characterization" and "Electromagnetic Data Interpretation for Subsurface Characterization".

His journey in oil and gas industry started with Halliburton in 2007. In 2018, Dr. Misra was recognized as the U.S. Department of Energy Early Career Awardee. For his technical contributions to geophysics and subsurface engineering, he has received several international awards, such as SEG J. Clarence Karcher Award, SPWLA Young Technical Professional Award, SPE Gulf Coast Formation Evaluation Award, and EAGE Arie Van Weelden Award. Dr. Misra holds a Bachelor of Technology in electrical engineering from the Indian Institute of Technology Bombay and a Ph.D. in petroleum and geosystems engineering from the University of Texas at Austin.

Course taught:
- *Introduction to Subsurface Machine Learning* (p 55)

MARK OLSON

Mark has over 25 years of experience in technical and leadership positions in Development, Exploration and Technology groups. He began his career as a Clastic Stratigraphic specialist in Upstream Technology of Phillips Petroleum/ConocoPhillips and then moved into several technical and leadership positions globally in Development and Exploration before returning to the technology organization as Manager of the Sedimentology & Stratigraphy Group. He moved to Apache Corporation in 2015 as the Geological Manager for Exploration & Production Technology before becoming Suriname Geoscience Lead on the exploration phase that led to numerous discoveries. Mark then became Director of Geology where he was responsible for the organizational structure, training, career development and technical assurance for all geologists in Development and Exploration worldwide. He has a BS and Msc Degrees in Geology from the University of Wyoming.

Throughout his career, Mark has developed a broad range of experience in the integrated evaluation of conventional and unconventional reservoirs from Basin Analysis to Reservoir Characterization in numerous basins and depositional systems worldwide (onshore, offshore, high temperature/high pressure, tight gas, heavy oil). He has led classroom & field-based training in subsurface characterization for over 500 geoscientists/engineers and defined competencies and training curriculum for geoscience career development.

Courses taught:
- *Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop* (p 16)
- *Modern Depositional Systems as Analogs for Subsurface Characterization* (p 61)

WILLIAM K. 'BILL' OTT, PE

William K. "Bill" Ott is an independent, international petroleum consultant based in both Houston and Singapore. An SPE Distinguished Lecturer 2007–08, he has conducted technical petroleum industry courses worldwide and written numerous technical papers relating to well completion and workover operations. This includes co-authoring the popular *World Oil Modern Sandface Completion Practices Handbook* and *World Oil Downhole Remediation for Mature Oil & Gas Fields*. Mr. Ott has a B.S. in Chemical Engineering from the University of Missouri and is a registered professional engineer in Texas.

Course taught:
- *Cement Repair Workshop* (p 33)

PK PANDE, PE

PK Pande, PE has deep knowledge and world class expertise that encompasses delivery of commercial/technical solutions for gas injection, EOR-CO2, CCUS, new and mature field development, unconventional resources, conceptual studies, and systems integration. He has exceptional expertise in reservoir characterization, EOR and IOR, field development, exploration appraisal, new technology implementation, organizational development, and strategic planning.

He has served as Chief Engineer for QEP Resources and Director, Reservoir Technology with Anadarko Petroleum Corporation. He held key reservoir and production engineering technical roles with TOTAL (Petrofina) and British Petroleum (Standard Oil of Ohio). PK served as the Society of Petroleum Engineers (SPE) Distinguished Lecturer on the topic, "Shale Resources – A Full Life Cycle Integrated Approach". Mr. Pande holds a Bachelor of Science in Chemical Engineering from the University of California, Berkeley and MS in Petroleum Engineering from New Mexico Institute of Mining and Technology. He is a Registered Professional Engineer in the State of Texas.

Course taught:
- *Navigating CCUS – Gulf Coast Region – Workshop* (p 49)

JORGE PASTOR, PHD

Dr. Jorge Pastor has 20 years of experience in the oil and gas industry as a Senior Geomechanics Engineer with Schlumberger and then a Principal Geomechanics Specialist with BHP before becoming a Managing Partner of Subsurface Alliance. Jorge received a BSc and MSc in Mechanical Engineering and PhD in Geomechanics all from the Pontificia Universidade Catolica de Rio de Janeiro.

Courses taught:
- *Geomechanics Aspects of CCS Projects* (p 46)
- *Geomechanics for Geothermal Projects* (p 46)

KEVIN PICKERING, PhD

With more than 25 years of experience, Kevin has conducted research in the Gulf of Mexico, offshore Japan, Arctic Norway, northern Russia, Newfoundland, Quebec, NE Scotland, southern Britain, SE France, Spanish Pyrenees, SE Spain, Tibet, Japan, Kyrgyzstan, Uzbekistan, California, and New Zealand. Kevin's research interests are many and varied, with more than 130 research papers, five authored/co-authored books and five edited books, that include the following topics: Earth surface processes (particularly all aspects of deep-marine sedimentology, stratigraphy and tectonics), surface processes on Venus, global environmental issues, stratigraphy, tectonics and sedimentation, sediment geochemistry and clay mineralogy, particularly relating to deep-marine environments.

Courses taught:
- *Deepwater Systems, Ainsa Basin, Spanish Pyrenees: Application to Hydrocarbon Prospectivity and Unconventional Plays* (p 60)
- *High-Continuity Sandy Turbidite System: Application to Hydrocarbon Prospectivity (SE France)* (p 60)

SRINI PRASAD

Srini Prasad is a petroleum reservoir engineering consultant with extensive worldwide upstream oil & gas industry experience with Hess, BP, and Occidental Petroleum. His experience spans exploitation of multiple basins and reservoir/fluid types: unconventional shale and conventional sandstone/chalk reservoirs; light oil, heavy oil and gas reservoirs; Bakken, Deepwater Gulf of Mexico, Guyana, Angola, Malaysia, Kuwait, Alaska, Peru, California, Norway, Denmark, Russia, Canada, Libya; and various phases of an asset life cycle including exploration, appraisal, sanction, development, start-up, production, pipelining, recovery enhancement and divestiture. He has held a variety of technical, subsurface, commercial, asset and functional leadership positions over his career. He was most recently the Chief Reservoir Engineer at Hess. Srini obtained his M.S in Chemical Engineering from the University of Houston where he was awarded a Research Fellowship. He received his B.Tech. in Chemical Engineering from the Indian Institute of Technology in Kanpur, India and graduated with a First Division with Distinction.

Courses taught:
- *Developing Robust Production Forecasts: Do's and Don'ts* (p 34)
- *How to Maximize the Value of Conventional Oil Reservoir Developments: Best Practices* (p 35)

BRADFORD E. PRATHER

Mr. Prather graduated from the University of Kansas in 1979 with a BSc in geology. Following graduation, he moved to the University of New Orleans to pursue a Master's degree in Earth Sciences. Prather joined the Onshore Division of Shell Oil Company in New Orleans in 1981. Brad has experience in the Smackover and Norphlet plays of onshore Mississippi, Alabama and Florida; the US Atlantic margin and shelf provinces of Louisiana and Texas; and deepwater GOM. He led Shell's Turbidites Research Team until 2008, and then returned to exploration as a Geological Advisor. He eventually became Regional Chief Exploration Geoscientist in 2009. Upon retirement from Shell in 2014, he joined the University of Kansas as an Adjunct Professor where he teaches courses focused on seismic stratigraphy, petroleum systems, and sedimentology. He serves on both the SEPM and AAPG Research committees and is a referee for many scientific journals. Prather is the recipient of Robert R. Berg Award for Outstanding Research (2009), Erasmus Haworth Most Distinguished Alumni Honors in Geology (2006), AAPG Distinguished Lecturer (2000-2001), Jules Braunstein Best Poster Award (2000), J. C. "CAM" Sproule Memorial Best Paper Awards (1993 and 1994) and W. A. Tarr Leadership Award (1979).

Courses taught:
- *Integrated Deepwater Depositional and Petroleum Systems* (p 18)
- *The Practice of Seismic Stratigraphy in Deepwater Settings* (p 24)

JONATHAN R. ROTZIEN, PhD

Jon Rotzien is President of Basin Dynamics and Adjunct Professor at University of Houston. He specializes in reservoir presence and quality forecasting in conventional and unconventional drilling programs. Prior to his present posts, he served BP and other supermajor and independent operators in a variety of basins and petroleum reservoir technical training programs.

As a business owner and scientist, Rotzien has participated in oil and gas exploratory to development drilling, mapping expeditions, technical competency training and consulting and has served as lead geologist in about one-third of those ventures. He is currently serving as Chair of the Houston Explorers Club. Rotzien received a Ph.D. in Geological Sciences from Stanford University and a B.A. degree in Geology from Colorado College.

Course taught:
- *Applied Deep-Water Sedimentology & Stratigraphy* (p 14)

ROBELLO SAMUEL, PhD

Dr. Samuel has been a Chief Technical advisor and a senior Fellow working with Halliburton since 1998. He began his career working on rigs as a field and drilling engineer for nine years with the Oil and Natural Gas Corporation. Since then he has developed more than 34 years of experience in domestic and international oil/gas drilling operations. He is the recipient of several awards including the Gulf Coast SPE Drilling Engineering Award, SPE International Drilling Engineering Award, SPE Distinguished Membership Award, and the Distinguished Lecturer award from the SPE.

Dr. Samuel has taught on the faculty of various universities, has published more than 200 technical papers, holds 67 US patents, and 40 patent pending applications. He serves regularly as a keynote speaker at major conferences and corporate forums and is regarded as one of the world's most influential contributors to advancement of research and practice in drilling engineering. Dr. Samuel has also authored thirteen drilling books. He holds BS and MS degrees in Mechanical Engineering, as well as MS and PhD degrees in Petroleum Engineering. Robello also received the SPE/AIME Honorary Membership award in 2021.

Courses taught:
- *Applied Drilling Engineering Optimization for Drilling Engineers* (p 32)
- *Applied Drillstring Mechanics for Drilling Engineers* (p 32)
- *Principles and Practices of Mud Motor* (p 36)

SELIM S. SHAKER, PhD

Selim S. Shaker directs and consults for Geopressure Analysis Services Inc. He received a BSc in Applied Geology and an MSc and PhDin Geology from ASU, Egypt. He also received a diploma in Hydrogeology from Prague University (UNESCO). With over 30 years in the oil industry, he started his career in Egypt as a well-site stratigrapher and structural geologist. During his 20 years of domestic service with Phillips Petroleum, his primary duties as an exploration geologist were prospect generation in offshore Gulf of Mexico and onshore coastal areas. He discovered/developed several fields and evaluated several exploration projects in NW Australia, Libya, Algeria, the North Sea and China.

After retiring from Phillips in 2000, Dr. Shaker established G.A.S. to focus on evaluating the implication of geopressure compartmentalization, seal integrity and salt interaction on leads and prospects on the Shelf and Deep Water of the Gulf of Mexico. Pre- and post-drilling risk assessment of a prospect is his specialty. Dr. Shaker is the Co-Chair of the AAPG Deep Water Workshop. He is an active member of AAPG, SEG, HGS, GSH, and American Association of Drilling Engineers (AADE). He has published over 40 papers and articles regarding pore pressure predictions and the impact of geological settings on subsurface geopressure profile and risk assessments.

Courses taught:
- *For Safe Drilling: Formation - Fracture Pressure Interpretations and Analysis* (p 34)
- *Pore Pressure, Fracture Pressure, and Well-Bore Stability* (p 49)
- *Seal and Reservoir Pressures Analysis for E&P Prospect's Risk Assessments* (p 22)

ROBERT F. SHELLEY, PE

Mr. Bob Shelley has over 40 years of experience with well completion, hydraulic fracturing design and reservoir evaluation working on numerous well completion projects worldwide including Asia, Australia, Canada, Europe, Latin America and the Middle East. He has multi-fractured horizontal completion experience as well, which includes working the Bakken, Barnett, Bone Springs, Eagle Ford, Fayetteville, Granite Wash, Haynesville, Marcellus, Monterey, Montney, Niobrara, Osage, Utica and Wolfcamp. He was an early adopter of Machine Learning and Artificial Intelligence (AI) to better understand the interaction of the completion design with the reservoir.

Bob has served as an SPE Distinguished Lecturer twice, sharing his knowledge of North American Basins with the world. In 2020-2021, he presented on the topic "Completion Design using Artificial Intelligence (AI) and Machine Learning – Case Histories". In 2015-2016, Bob lectured on the topic "Optimization of Multi-Fractured Horizontal Completions; A New Industry Challenge". Bob has published over 40 technical papers, many as lead author, and holds more than 10 patents. Mr. Shelley has a BS in Civil Engineering from Colorado State University and Business Training from the University Of Oklahoma and East Tennessee State University.

Course taught:
- *Artificial Neural Systems in Petroleum Engineering* (p 33)

ROBERT 'BOB' SHOUP

Bob is a Board Certified Petroleum Geologist and a Louisiana Registered Geoscientist with over 35 years of experience in basin analysis, regional studies, new play generation, prospect evaluation, field studies and development planning, and project management. Bob has a MS in Geology from the University of Oklahoma and began his career at Shell Oil in 1980. Beginning in 1999, Bob worked for four years with private oil companies before becoming an independent consultant and trainer in 2003. He consults in the Asia Pacific region as well as the US Gulf of Mexico.

Over the course of his career Bob has discovered or helped to discover over 100 MMBOE, and has a commercial exploration success rate of 46%. Bob is a recognized expert in clastic depositional environments, rift basins, and in syndepositional structural systems. He is an active contributor in the professional community. Bob is SCA's Chief Geologist, the current Vice President, Regions for AAPG, a past President of AAPG's Division of Professional Affairs (DPA), and past Secretary-Editor of the AAPG House of Delegates. He has served on numerous AAPG Committees and was Chairman of AAPG's Mentor, Membership and Student Chapter Committees. He is a recipient of AAPG's and the DPA's Distinguished Service Award and was granted Honorary Life Membership in the DPA.

Courses taught:
- *Applied Subsurface Geological Mapping* (p 15)
- *Clastic Sedimentology, Stratigraphy, and Reservoir Characterization with Core Workshop* (p 16)
- *Effective Petroleum Systems Analysis* (p 17)
- *Geology-Based Topical Contouring Workshops* (p 18)
- *Mapping & Interpreting Clastic Reservoirs* (p 19)
- *Project Management for Exploration and Development Projects* (p 20)
- *Quality Assurance/Quality Control Skills for Subsurface Mapping (QAQC)* (p 20)
- *QC Techniques for Reviewing Prospects and Acquisitions* (p 21)

STEPHEN A. SONNENBERG, PhD

Dr. Sonnenberg is a professor and holds the Charles Boettcher Distinguished Chair in Petroleum Geology at the Colorado School of Mines. He has over 25 years of experience and specializes in unconventional reservoirs, sequence stratigraphy, tectonic influence on sedimentation, and petroleum geology. Sonnenberg received BS and MS degrees in geology from Texas A&M University and a PhD degree in geology from the Colorado School of Mines. Steve has served as President of several organizations including the American Association of Petroleum Geologists, Rocky Mountain Association of Geologists, and Colorado Scientific Society. He also served on the Colorado Oil and Gas Conservation Commission from 1997-2003 and was the Chair of the Commission from 1999-2003.

He is the recipient of the Young Alumnus Award, Outstanding Alumnus Award, and Mines Medal from the Colorado School of Mines, Distinguished Achievement Medal from Texas A&M University, the Halbouty Medal from AAPG, distinguished service awards from AAPG and RMAG, honorary membership awards from AAPG, RMAG and the Colorado Scientific Society, and most recently the Robert J. Weimer Lifetime Contribution Award from the Rocky Mountain Section of the AAPG.

Courses taught:
- *Carbon Capture Utilization and Storage - A Geological Perspective* (p 45)
- *Elements of Energy Geology: Basin Analysis & Subsurface Energy Storage* (p 17)
- *Elements of Petroleum Geology* (p 17)
- *Reservoir Characterization for Mudrock Reservoirs* (p 21)
- *Unconventional Resource Plays - Workshop* (p 43)

RAY SPENCE

Ray is a Senior Consultant at Decision Frameworks and has been with the company since 2017. He has supported numerous projects in the upstream and midstream oil and gas business as well as portfolio planning, manufacturing and country entry strategy. Ray's expertise lies in strategic planning, decision framing, uncertainty modeling, and probabilistic analysis. As an educator, Ray has taught Decision and Risk Analysis, Value of Information, and Game Theory to clients around the world.

Ray has a B.S. in Petroleum Engineering from the University of Houston and is pursuing coursework in sustainability. He is the 2020 – 2021 President of the Houston Chapter of the Society of Decision Professionals and currently serves on the executive committee.

Courses taught:
- *Introduction to Decision Framing for Project Management* (p 55)
- *Justifying Data - Value of Information Course* (p 55)

W. LANSING TAYLOR, PhD

Dr. W. Lansing Taylor is an accomplished structural geologist with extensive industry and field experience specializing in structural geology, fractured reservoirs, geomechanics and field geology. He joined SCA as an instructor in 2008. His *Structural Styles in Petroleum E&P* short course and the accompanying *Structural & Sequence Stratigraphy Field Course (Hill Country, TX)* are consistently highly rated among our students. His development and EOR experience includes Hugoton, Golden Trend, Permian Basin, Ozona, and the Austin Chalk, while his exploration experience includes Alaska, North Africa, Middle East, and SE Asia. Lans performed both technical and management roles with Talisman Energy and Anadarko Petroleum.

Dr. Taylor received his B.A. in mathematics and geology at Skidmore College, receiving department honors of Suma Cum Laude. He received his PhD in Quantitative Structural Geology, "Fluid flow and chemical alteration in fractured sandstone", Department of Geological and Environment Sciences from Stanford University.

Courses taught:
- *Carbonate Reservoirs of the Permian Basin NW Shelf* (p 59)
- *Structural and Sequence Stratigraphic Field Course (Hill Country, TX)* (p 61)
- *Structural Styles and Tectono-Stratigraphy for the Mid-Continent* (p 62)
- *Structural Styles in Petroleum Exploration and Production* (p 24)

ALI TURA, PhD

Dr. Ali Tura is Professor of Geophysics at the Colorado School of Mines (CSM) with over 30 years of industry experience prior to academia. Dr. Tura was Geophysical Senior Fellow at ConocoPhillips, Geophysical Advisor at Chevron, and 4D subject matter expert at Shell. He has also been part of the global exploration review teams for ConocoPhillips and Chevron.

Dr. Tura is currently Chief Scientist at Tulip Geosciences consulting on global project reviews and geophysical technology implementation with several energy companies in addition to providing courses. He is also co-director of the industry consortium Reservoir Characterization Project (RCP) at CSM which is entering its 40th year with around 20 industry sponsors. Dr. Tura's expertise is in reservoir characterization and monitoring, rock physics and AVO, multi-component and time-lapse seismic, CCUS, fiber optics, machine learning, and compressive sensing acquisition and processing. He was SEG Distinguished Lecturer in 2021 and received the Best Paper Award at SEG-IMAGE conference in 2021 (out of over 700 industry/vendor/academia papers). Dr. Tura serves on multiple SEG and SPE committees related to reservoirs, research, CCUS and technical committees for organizing various international conferences.

Courses taught:
- *Rock Physics, Well Logs and Well Tie for Seismic Exploration and Production* (p 22)
- *Time-Lapse and Multicomponent Seismic* (p 25)

JULIA S. WELLNER, PhD

Dr. Wellner is a marine geologist at the University of Houston. Julia received her bachelor's degree from Bryn Mawr College, her Master's degree from the University of Alabama, and her Ph.D. from Rice University in 2001. Following her graduation from Rice, she worked for five years as a post-doctoral fellow and lecturer in the Department of Earth Science there. She is now Research Assistant Professor in the Department of Earth and Atmospheric Sciences and Co-Director of the Geoscience Learning Center at the University of Houston. Her primary research interest is in Antarctic glacial history and marine geology and she has completed six field seasons offshore Antarctica on the icebreaker RV/IB Nathaniel Palmer. She also works in the Gulf of Mexico and Texas coast on projects related to coastal change and sediment budgets.

Course taught:
- *Modern Coastal Systems of Texas Field Course (Galveston, TX)* (p 60)

JAMES J. WILLIS, PhD

Dr. Willis received his B.S. and M.S. degrees in Geology from the now University of Louisiana at Lafayette in 1989 and 1990, respectively, and his Ph.D. as a National Science Foundation research fellow at Baylor University, Waco, Texas, in 1993. From 1994-1996, he studied planetary tectonics as a NASA-funded postdoctoral fellow at Southern Methodist University. In 1996, he returned to UL–Lafayette, where he was awarded in 1997 the Hensarling-Chapman Endowed Professorship in Geology. He began independent consulting activities in 1991, and in 2001 left academia for full-time consulting for clients ranging from one-man shops to supermajors. He rejoined UL–Lafayette as an adjunct professor from 2011–2018. James is an active researcher, receiving several million dollars in grants from federal, state, and industry sources, presenting numerous talks, including a 2019 AAPG Levorsen award, and publishing on a diversity of geoscience topics, including a Grover E. Murray Best Published Paper award in 2017 and co-author of the inaugural GCAGS/GCSSEPM Transactions Best Student Paper award in 2018.

Courses taught:
- *Applied Seismic Interpretation Workshop* (p 15)
- *AVO Inversion and Attributes: Principles and Applications* (p 16)

LESLI WOOD, PhD

Dr. Wood joined the faculty at Colorado School of Mines in January 2015 as a Professor and the Robert Weimer Endowed Chair in Sedimentary and Petroleum Geology, where she is director of the Sedimentary Analogs Database and Research Program (SAnD). Prior to joining CSM, Dr. Wood held positions at the University of Texas at Austin, Amoco Production Company and Arco. She received her doctorate in 1992 from Colorado State University following her MS work at the University of Arkansas.

She specializes in quantitative seismic geomorphology of clastic basins, structural and sedimentary system interactions, submarine mass failures, petroleum geology, mobile shales and geomorphology of Mars. She has served as SEPM Society for Sedimentary Geology national Secretary-Treasurer, the GCSSEPM President and is active in the Geological Society of America, the American Association of Petroleum Geologists and the Geological Society of Trinidad and Tobago. In 2022, Lesli was elected as an honorary member to The Society of Sedimentary Geology (SEPM). She was also named the 2022 winner of the Robert R. Berg Outstanding Research Award from the American Association of Petroleum Geologists.

Courses taught:
- *Deepwater Jackfork Field Course (Arkansas - Oklahoma)* (p 59)
- *Deepwater Jackfork and Atoka Field Course (Arkansas - Oklahoma)* (p 59)
- *Reservoir Characterization of Clastic (Sandstone) Reservoirs* (p 21)
- *Seismic Geomorphology* (p 23)

JAMIE WOOLSEY

Jamie is a consulting geologist with 18 years of experience in petroleum exploration, development, and production of both unconventional and conventional plays throughout multiple basins in the US. Jamie has interpreted over a thousand horizontal wells in numerous basins and formations for various operators. Jamie received her B.S. and M.S. in Geology from the University of Arkansas. She is also an adjunct professor at the University of Arkansas where she teaches subsurface geologic mapping and assists in mentoring the IBA team. Jamie currently serves as President of the AAPG Mid-Continent Section.

Course taught:
- *Geosteering: Best Practices, Pitfalls, & Applied Solutions* (p 18)

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- Nodal Analysis and Artificial Lift:
  Students studied topics including production optimization, flow assurance, multi-phase flow, artificial and gas-lift, electric submersible pump, digital oilfield implications, and machine learning/artificial intelligence applications. Our instructor then worked with field data provided by the client to complete well tests, completion diagrams, and well models.

- Well Performance Analysis:
  Participants learned about analytical tools including the Reciprocal-Productivity Index, Water-Oil Ratio (WOR) Diagnosis, Rate-Transient Analysis, and Arps' Hyerbola, and then reviewed these tools in the context of case studies and well performance evaluations. Our instructor applied these evaluations to the client's wells for further understanding.

Contact Our Training Department training@scacompanies.com (713)789-2444

SCA WEBINARS

SCA offers **Live and On-Demand Webinars** of various oil and gas topics presented by our industry-recognized experts who are actively engaged in their areas of expertise and as instructors for SCA. Webinar content is selected as a preview of their respective SCA courses.


Addressing the Leadership Gap in the Energy Industry: Two Case Studies with a Competency-Based Approach
Presented by: C. Susan Howes, PE, PHR & Robert Taylor

Artificial Lift Challenges in Unconventional Reservoirs
Data Analytics for Artificial Lift and Production Engineers
Production Data Needs TLC Too
Why and How Gas Lift is Different from GoM to Permian
Presented by: Rajan N. Chokshi, PhD
Associated Courses:
- Artificial Lift and Real-Time Optimization for Unconventional Assets
- Data Analytics Workflows for Artificial Lift, Production, and Facility Engineers

Artificial Neural Systems Provide Wolfcamp Completion Design Insight
Presented by: Robert 'Bob' Shelley, PE
Associated Course: Artificial Neural Systems in Petroleum Engineering

Atypical Hydrocarbon-Water Contacts: Perched Water and Tilted Hydrocarbon-Water Contacts
Presented by: Jim Brenneke
Associated Course: Applied Subsurface Geological Mapping

Avoiding Dry Holes
Habits of Effective Geoscientists
Would You Recommend Drilling a Dry Hole?
Presented by: Bob Shoup
Associated Courses:
- Applied Subsurface Geological Mapping
- QC Techniques for Reviewing Prospects & Acquisitions
- Quality Assurance/Quality Control Skills for Subsurface Mapping

Big Bend Field Trip - Normal Faulting at Santa Elena Canyon Dog Canyon and Persimmon Gap - Thrust Faulting
Presented by: Eric D. Carlson
Associated Course: Big Bend Field Course


Carbon Neutral Fuels - The Value Propositions
Presented by: Christine Ehlig-Economides, PhD & Dimitrios G. Hatzignatiou, PhD
Associated Course: Carbon Capture Utilization and Storage – An Engineering Perspective


Cement Evaluation and Remediation
Presented by: William "Bill" Ott, PE & James Smolen, PhD
Associated Course: Cement Repair Workshop (Ott Only)

Deepwater Sedimentation
Presented by: Jon R. Rotzien, PhD
Associated Course: Applied Deep-Water Sedimentology & Stratigraphy

Deepwater Systems Classification & Sediment Partitioning
Presented by: Bradford E. Prather
Associated Courses:
- Integrated Deepwater Depositional and Petroleum Systems
- The Practice of Seismic Stratigraphy in Deepwater Settings

Drillstring Design and Drilling Optimization with Mud Motor Operation
How Does Well Design, Engineering and Real-Time Operation Impact Performance, Efficiency, and Optimization?
Presented by: Robello Samuel, PhD
Associated Courses:
- Applied Drilling Engineering Optimization for Drilling Engineers
- Applied Drillstring Mechanics for Drilling Engineers

Energy Transition - The Next Step to Net Zero
Presented by: Nathan Meehan, PhD, PE
Courses Taught: Energy Transition for Petroleum Professionals

Evolution of Isolated Carbonate Buildups
Kinetic Sequence Stratigraphy: Its Application to Exploration
Presented by: Oscar Lopez-Gamundi, PhD
Associated Courses:
- Carbonate Sedimentology and Sequence Stratigraphy
- Sequence Stratigraphy Applied to O&G Exploration

Evolution of the Mergui Terrace, Offshore Myanmar: Integration of Biostratigraphic, Log, and Seismic Data
Presented by: William N. Krebs, PhD
Associated Course: Applied Biostratigraphy in Oil and Gas Exploration and Production

Excess Permeability in Carbonate Reservoirs: Curse or Blessing?
Presented by: Fermin Fernandez-Ibañez, PhD
Courses Taught:
- Geomechanics Aspects of CCS Projects
- Geomechanics for Geothermal Projects

Exploring for Mudrock Reservoirs
Geologic Carbon Capture, Utilization, and Storage
Unconventional Petroleum Systems: From the Deep Basin to Tar Sands
Presented by: Stephen A. Sonnenberg, PhD
Associated Courses:
- Carbon Capture Utilization and Storage - A Geological Perspective
- Reservoir Characterization for Mudrock Reservoirs
- Unconventional Resource Plays - Workshop

Exploring in Ancient Landscapes: Seismic Geomorphology
Presented by: Lesli Wood, PhD
Associated Course: Seismic Geomorphology

Expression of Sequence Stratigraphy in Outcrop, The Book Cliffs
Presented by: William Little, PhD
Associated Field Course: The Book Cliffs, Utah: A Case Study in Coastal Sequence Stratigraphy

Gain Insights Into Long-Term Performance Using Various DCA Tools
In Search of the 'Right' DCA Method for Unconventional Reservoirs
Presented by: Shah Kabir
Associated Course: Reservoir Management of Unconventional Reservoirs: from Inception to Maturity

Geomechanics of Carbon Capture & Storage
Geomechanics of CCS - Why, How, and When?
Presented by: Ewerton Araujo, PhD
Associated Course: Geomechanics Aspects of CCS Projects

Geopressure for Exploration Success: From the Source to the Well Head
Pore and Geopressure: Prediction Framework and Applications for E&P
Subsurface Compartmentalization: HC Trapping and CO_2 Sequestration
Presented by: Selim Shaker, PhD
Associated Courses:
- Pore Pressure, Fracture Pressure and Well-Bore Stability
- Seal and Reservoir Pressures Analysis for E&P Prospects Risk Assessment


Geothermal Systems
Presented by: Silviu Livescu, PhD & Birol Dindoruk, PhD
Associated Course: Geothermal Energy

Getting It Right with Fiber Optics- From Monitoring Frac Growth to Managing Well Integrity
What Are You Missing About Your Well and Reservoir? Fiber-Optic Sensing Could Give You the Answer!
Presented by: Dennis Dria, PhD
Associated Course: In-Well Fiber Optic Sensing

Identifying Economic Refrac Candidates in the Eagle Ford
Organic Shale Refracs - Economical at Current Prices?
Top 10 Reasons to Refrac Organic Shale Wells
Use Logs & Production Data to Predict Organic Shale EURs
What Reservoir and Geomechanical Properties are Needed for a Successful CCUS Project
Presented by: Robert 'Bob' Barba
Associated Courses:
- "Best Practices" for New Well Fracs and Legacy Well Refracs
- Open Hole and Cased Hole Petrophysical Inputs for Carbon Capture Projects
- Practical Interpretation of Open Hole Logs

Identifying Flow Regimes: A Big Assist for Production Forecasting
New PRMS Regulations
The SEC's Reliable Technology Rule: Where Are We Today?
Presented by: W. John Lee, PhD
Associated Courses:
- PRMS and SEC Reserves and Resource Regulations
- Production Forecasting for Low Permeability Reservoirs

Leveraging a Decision Quality Approach for Strategic Optionality
Optimization as a Path to Lower Emissions: Myth or Reality?
Powering Purpose: Fueling Team Performance in the Energy Sector
Presented by: Amalia Olivera-Riley, PhD
Service: Business Advisory Services

Machine Learning for Subsurface Characterization
Presented by: Siddharth Misra, PhD
Associated Course: Introduction to Subsurface Machine Learning

Mapping Faulted Surfaces with Petrel©
Mapping Horizontal Wells with Petrel©
Presented by: Laurie Green, MSc, PG
Associated Course: Principles of Mapping with Petrel©

Maximize Company Value with the Right Subsurface Development
Presented by: Srini Prasad
Associated Course: How to Maximize the Value of Conventional Oil Reservoir Developments: Best Practices

Modern Challenges for Pressure and Rate Transient Analysis
Presented by: Christine Ehlig-Economides, PhD
Associated Course: Pressure Transient Test Design and Interpretation

Mudrock Sedimentology on Unconventional Shale Reservoirs
Presented by: Ursula Hammes, PhD
Associated Course: Shale Reservoir Core Workshop: Sedimentologic and Stratigraphic Assessment of Organic-Rich Mudrock

Navigating CCUS – The Landscape, Historical Context, Opportunities & Participation
Presented by: PK Pande, PE
Associated Course: Navigating CCUS - Gulf Coast Region - Workshop

Risk Management and Response Planning to Minimize Impact to Projects (Including Cyber Security)
Presented by: Jill B. Almaguer, PE, MBA, PMP
Associated Course: Project Management Professional Exam Prep


Small Data + Simple Model = BIG DATA
Why a No-Geology Model Helps Us Understand Geology
Presented by: Larry Lake, PhD & Jerry Jensen, PhD
Associated Course: Managing Mature Oilfields with Capacitance-Resistance Modelling


Steer Without Fear: Practical Geosteering Applications
Presented by: Jamie Woolsey, MS & Sara Callner, PhD
Associated Course: Geosteering: Best Practices, Pitfalls, & Applied Solutions (Woolsey Only)

Structural and Sequence Stratigraphic Field Course
Structural Styles in Petroleum Exploration & Production
Presented by: Lans Taylor, PhD
Associated Courses:
- Structural and Sequence Stratigraphic Field Course
- Structural Styles in Petroleum Exploration & Production

The Upper Texas Coast as Reservoir Analogs
Presented by: Julia Smith Wellner, PhD
Associated Course: Modern Coastal Systems of Texas Field Course (Galveston, Texas)

Visual Cuttings & Core Description to Characterize Reservoir & Non Reservoir Rocks
Presented by: Robert Merrill, PhD
Associated Course: Visual Rock Characterization

What is Your Fracture Conductivity Anyway? Damage Mechanisms and Other Concerns
Presented by: Jennifer Miskimins, PhD
Associated Course: Hydraulic Fracturing: Theory & Application

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Our training portfolio includes courses specific to the following disciplines:

- **Geoscience (p 14-25)**
- **Engineering (p 32-38)**
- **Unconventional Reservoirs (p 40-43)**
- **Energy Transition (p 45-47)**
- **Formation Evaluation (p 49-50)**
- **Multi-Disciplinary & Introductory (p 53-56)**
- **Field Courses (p 58-62)**

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