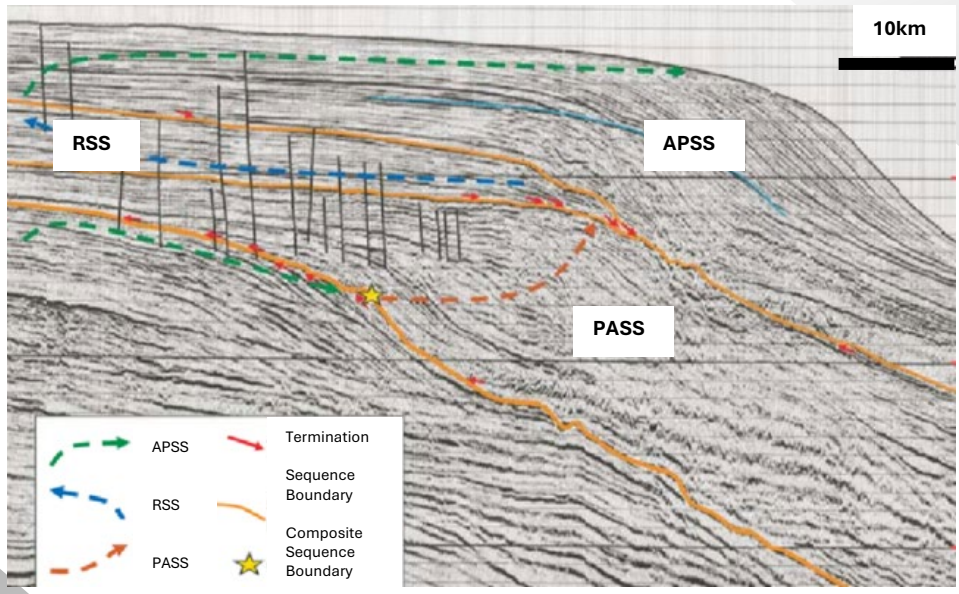
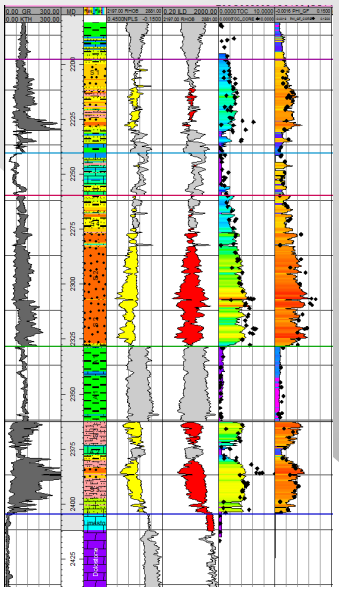
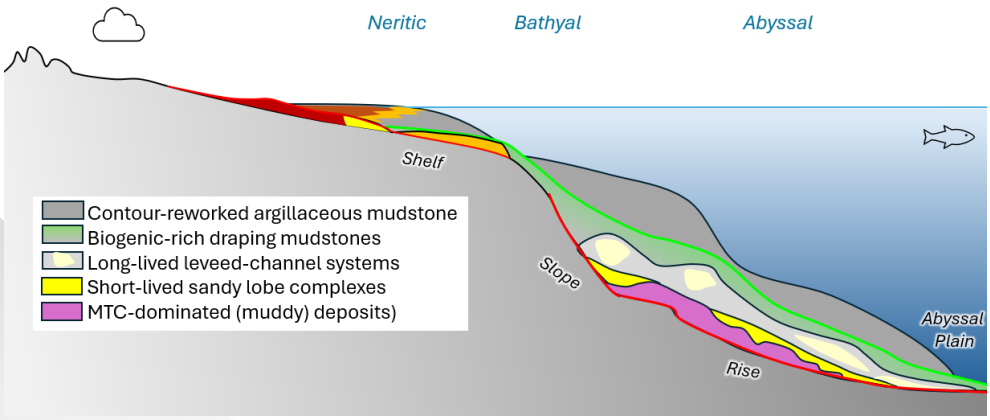
ACT GEO







Classroom Courses

Contact us:

rene@act-geo.com

https://act-geo.com/

The ACT-GEO training philosophy

With over fifty years of combined experience in developing and delivering training programs across companies, universities and organizations there is one key thread in our training delivery:

There is no one-size-fits all, and we strive to make each course delivery bespoke to the specific needs of the audience.

Our training is based on scientific foundation, strongly applied to subsurface problem-solving and prediction and delivered in the most cost-effective manner.

All our training courses combine high quality with affordability. We have been delivering training for the last 10 years across large and small international oil companies, national companies and academic institutions.

Rene & Vitor

ACT-GEO course considerations

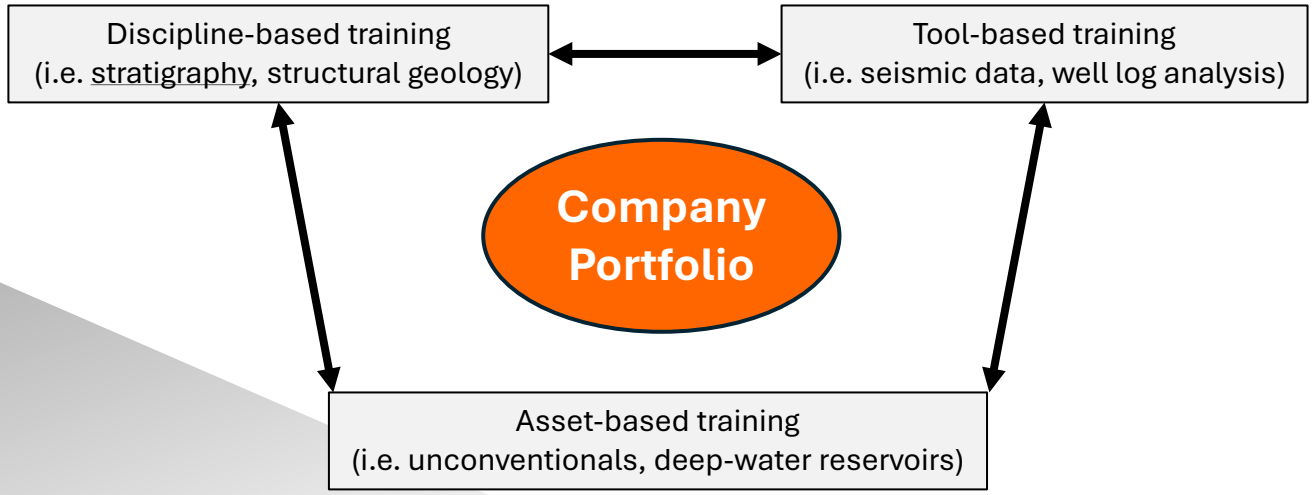
The sequence-stratigraphic method is a foundational component of all our training delivery and is utilized as a consistent framework for subsurface characterization and prediction.

Given the vast amount of lecture and exercise materials we have available in our catalogue, we make our delivery bespoke with discipline-based, tool-based and asset-based examples to fit the specific needs of the organizations that we deliver the training to.

Training can be delivered in the classroom, in the field and online.

Training is hands-on with 50% of time spend on lectures and 50% spend with subsurface datasets across seismic, well log and core.

All our courses consist of 1-day independent modules. A training course can be customized by combining specific 1-day modules.



Classroom Curriculum summary

Our classroom training offerings cover nine fundamental topics. Each course covers fundamental theory and hands-on business-applied exercises and can be customized from 2 to 5 days in length.

Classroom Seminars (3 to 5 days)
Sequence Stratigraphy and its Expression on Cores, Well Logs and Seismic Data (3-5 days)
Deep-water depositional systems: Reservoir and Retention Styles (3 days)
Shallow water depositional systems: Reservoir and Retention Styles (3 days)
Carbonate depositional systems: Reservoir and Retention Styles (3 days)
Fundamentals of Petroleum Systems: Source, maturation, migration (3-4 days)
Fundamentals of pressure, trap & seal (3-4 days)
Genetic Play and Prospect Generation, Risking and Assessment (4-5 days)
Siliciclastic facies in cores and logs (3 days)
Fundamentals of unconventional reservoir systems (3 days)

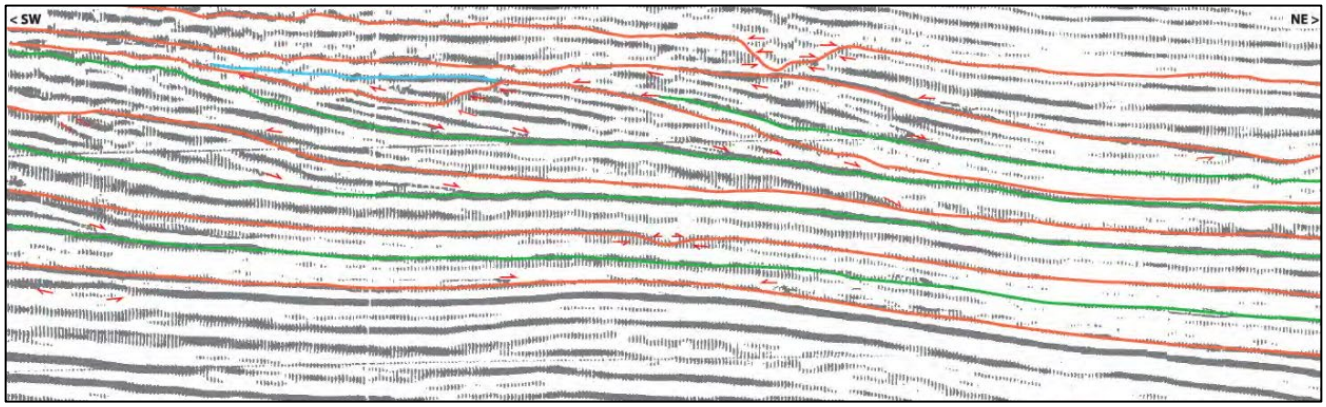
Our Clients

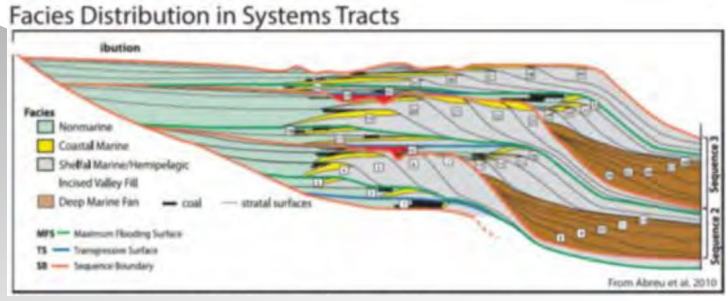
We have delivered repeated training courses to the following companies:

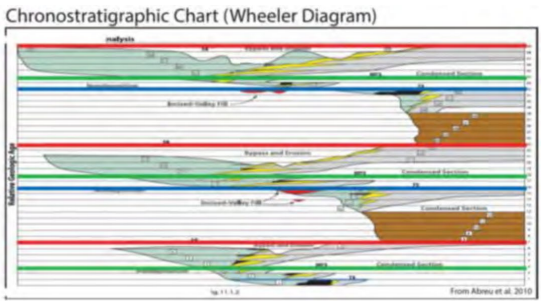
Sequence stratigraphy– cores, logs & seismic 3 to 5 DAYS

The sequence stratigraphic method was developed to support geoscientists with the geologic interpretation of subsurface data. This method is utilized to predict the presence of petroleum play elements and to assess their quality before drilling. Sequence stratigraphy is applied to core, outcrop, well logs as well as 2- D and 3-D seismic data across all depositional environments.

This course reviews basic definitions and terminology of surfaces and systems tracts and introduces the sequence stratigraphic hierarchy. Training exercises and datasets are thoroughly discussed, and participants later interpret subsurface data in terrestrial, shallow marine, and deep-marine depositional settings within a sequence stratigraphic framework. Based on the sequence stratigraphic method, the recognition and mapping of play elements from exploration to production scales is emphasized in this course.







Sequence stratigraphy– cores, logs & seismic 5 DAYS

COURSE CONTENT

- Lithostratigraphy vs. chronostratigraphy interpretations
- Fundamentals of sequence stratigraphy
- Well-log interpretation, correlation, and mapping
- Seismic response of key stratigraphic surfaces
- Seismic reflection termination mapping
- seismic facies analyses
- Hydrocarbon play element mapping
- Criteria and mapping strategies for play elements in non-marine, shallow-marine, and deep-marine depositional settings

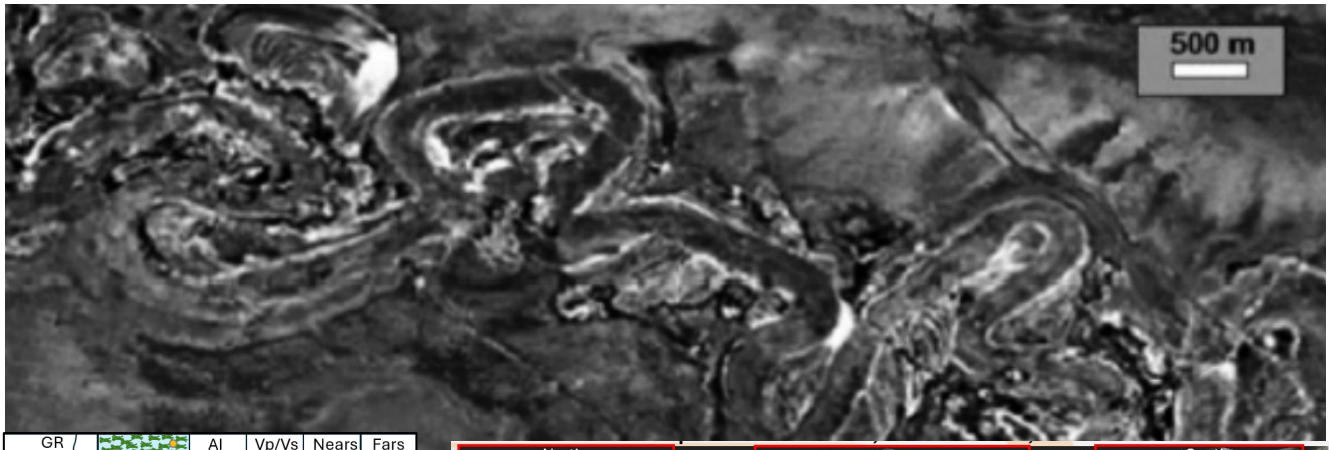
LEARNING OUTCOMES

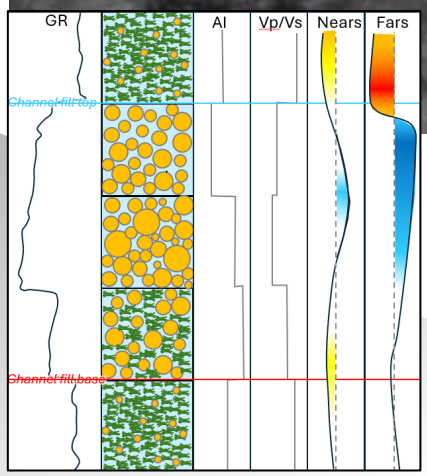
- Explain sequence stratigraphic concepts
- Define sequence stratigraphic terminology
- Interpret facies and facies stacking patterns
- Implement the concept of facies, facies stacking and shoreline trajectory to identify parasequences, systems tracts & stratigraphic surfaces.
- Differentiate the main controls on depositional sequences
- Interpret core, outcrop, well-logs, and seismic lines
- Apply the sequence stratigraphic method across depositional environments
- Recognize and map hydrocarbon play elements across depositional settings

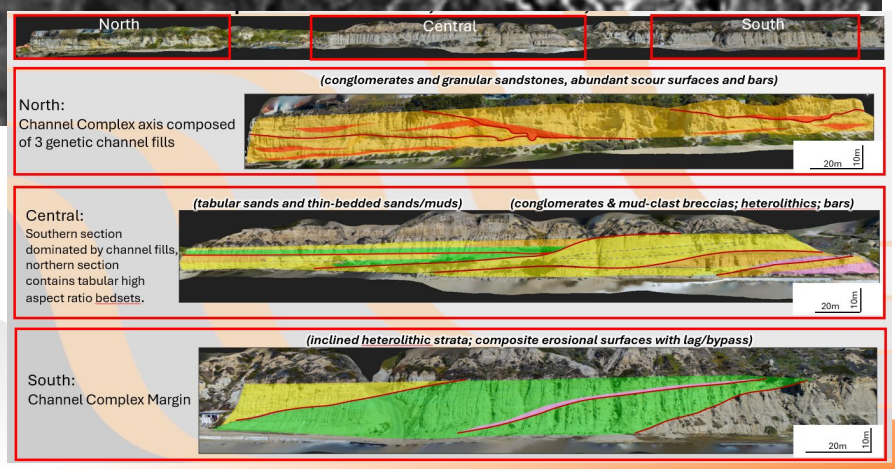
Module 1	Module 2	Module 3	Module 4	Module 5
Introduction of concepts with cores, logs, seismic Stratigraphy History Sequence Stratigraphy concepts and method 1D sequence stratigraphy (cores and well logs. Well log correlations (incised valleys) Seismic stratigraphy introduction	**Sequence Stratigraphy in paralic clastic systems** Idealized depositional sequences. Depositional system architecture (river, wave and tide influenced systems) High resolution reservoir mapping Seal evaluation for stratigraphic traps	**Sequence Stratigraphy in deep-water systems** Idealized depositional sequences. High resolution seismic-scale architecture of confined and distributive systems Application to stratigraphic trap mapping and evaluation Rock physics calibration	**Carbonate and mudstone settings** Carbonate sequence stratigraphy and reservoir quality. Mixed carbonate-clastic systems. Sequence stratigraphy or organic-rich rocks source rocks. Sequence stratigraphy of unconventional reservoir systems.	**Tectonostratigraphy** Tectonostratigraphy fundamentals. Syn-rift tectonostratigraphic interpretation of (half) grabens Conjugate margin style sequence stratigraphic interpretation.

Deep-water depositional systems: Reservoir and Retention Styles 3 DAYS

This course combines field observations with in-class lectures and exercises to examine six deep water (DW) depositional systems. Field exercises emphasize practical applications by focusing on descriptions of DW lithofacies, stratal geometries, and the recognition of key stratigraphic surfaces. Participants learn how to describe core, integrate core datasets and well-log information with seismic for generating high-resolution fairway maps of reservoirs in different DW settings. Demonstrations in this course incorporate engineering data and show participants how to improve reservoir performance predictions. Examples of integrated core, well-log, and seismic datasets are compared and contrasted to outcrop datasets to help refine interpretation skills and extrapolate 2-D outcrop information into 3-D views of reservoir depositional systems.







Deep-water depositional systems: Reservoir and Retention Styles 3 DAYS

COURSE CONTENT

- Interpretation of sequence stratigraphic surfaces in DW settings
- Utility and pitfalls for use of outcrop datasets as reservoir analogs
- DW depositional models and reservoir archetypes
- Reservoir architecture of confined, weakly confined & distributive systems
- Recognition criteria and mapping strategies for reservoir and seal play elements in DW depositional settings
- Risking reservoir presence and predicting net-to-gross in DW systems
- Risking seal presence relative to column height constraints
- Appraisal and Production strategies for the archetypes of DW reservoirs

LEARNING OUTCOMES

- Comprehend sedimentological processes in deep water (DW) systems
- Recall DW lithofacies nomenclature and definitions
- Describe DW lithofacies from core and how to relate facies to reservoir architecture and environment of deposition (EoD)
- Interpret DW EoD based on lithofacies associations, stacking, and diversity
- Extrapolate key stratigraphic surfaces based on variations in lithofacies stacking patterns and associations
- Apply outcrop analogues to understand 3-D distribution of reservoir facies
- Build geologic models by tying rock properties to facies
- Map Seal components to risk seal adequacy

Module 1	Module 2	Module 3
Outcrop, core, log and seismic expression of deep-water depositional systems overview of deep-water depositional models through time Deep-water depositional processes: sedimentology and facies in core & outcrop Petrophysics and rock physics response of deep-water reservoirs and seals Seismic architecture of deep-water systems.	Reservoir presence and quality attributes in exploration, appraisal and development. Reservoir presence and quality risking and assessment for exploration plays, prospects and drill wells. Post discovery appraisal strategies and development plan considerations Field development and production considerations	Static and dynamic Trap-Seal attributes. Trap mapping, seal risking and column height considerations in structural traps Trap mapping, seal risking & column height considerations in stratigraphic traps Trap mapping, seal risking and column height considerations in syn-kinematic mobile substrate (salt/shale) settings

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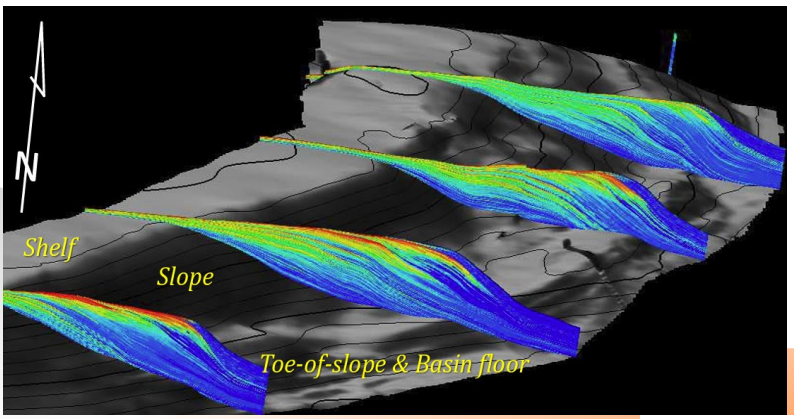
Shallow Water Depositional Systems: Reservoir and Retention Styles 3 DAYS

This hands-on course provides participants with practical recognition criteria, mapping strategies, dimensional datasets, and reservoir architectures of different coastal to shallow marine depositional systems that are known for producing conventional subsurface reservoirs.
From a landward to basinward transect, this course systematically introduces participants to the main environments of deposition (EoD) and focuses on where reservoir quality sands are deposited. This course delivers modern examples, outcrop analogues, core photos, well-log signatures and seismic data for each EoD.
Facies, facies associations, log and seismic response, geomorphology, as well as recognition criteria for each EoD is thoroughly discussed and evaluated. By the end of the course, participants predict reservoir geometries, dimensions, and net-to-gross ratios of fluvial and paralic sedimentary systems.



ACT GEO

Shallow Water Depositional Systems: Reservoir and Retention Styles 3 DAYS

COURSE CONTENT

- Sequence stratigraphic interpretation method
- Clastic facies in transitional marine environments
- Facies, log motif and seismic response of fluvial and transitional systems
- Facies, log motif and seismic response of river-, wave-, and tide-dominated systems
- Recognition criteria and mapping strategies for play elements in terrestrial and shallow marine settings

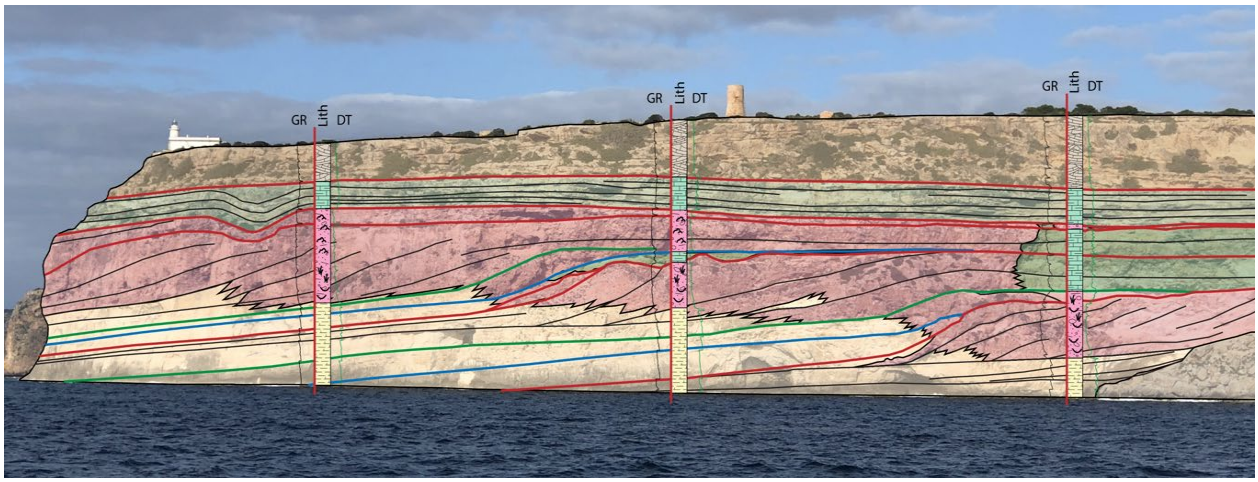
LEARNING OUTCOMES

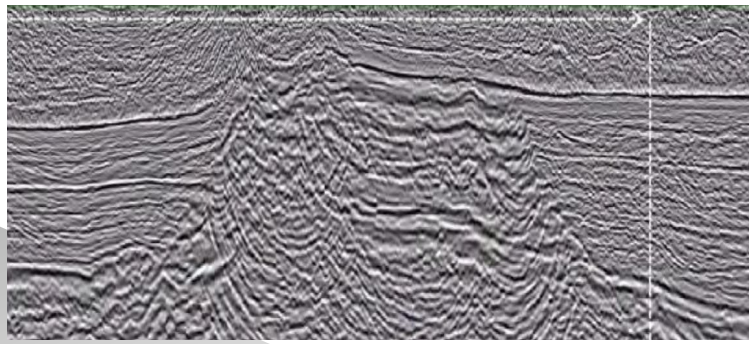
- Recognize and describe sedimentary structures from coastal plain to shallow marine strata
- Document coastal plain to shallow marine (also known as marginal marine, paralic or transitional) siliciclastic systems from core
- Interpret siliciclastic depositional environments from core, well logs, and seismic data
- Predict distributions of clastic reservoirs and architectures along depositional strike and dip
- Map seismic facies to de-risk reservoir presence and predict net-to-gross ratios in shallow marine and fluvial systems
- Seal evaluation techniques for structural and stratigraphic traps

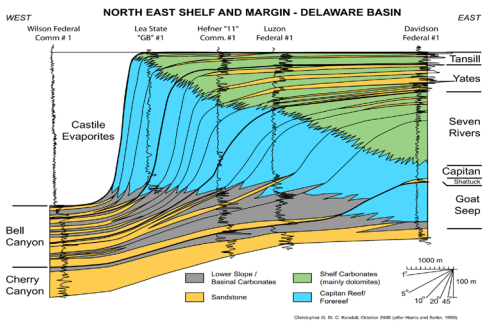
Module 1	Module 2	Module 3
Introduction to Depositional Systems (Models, outcrop examples, core facies).	Reservoir Architecture: Application to Exploration risking & assessment	Seal Risking for Stratigraphic trap prospects
Sequence Stratigraphic Interpretation Fundamentals	Reservoir Architecture: Application to field development (connectivity)	Connectivity and Compartmentalization in faulted reservoirs

Carbonate Depositional Systems:
Reservoir and Retention Styles 3 DAYS

This course is specifically designed for geoscientists and engineers exploring and developing plays in carbonate systems. Participants will improve their ability to distinguish depositional facies and play elements of carbonate margins on the well to seismic scale. Prediction of reservoir presence, quality and seal are areas of focus, as is the construction of sequence stratigraphic frameworks.







Carbonate Depositional Systems: Reservoir and Retention Styles 3 DAYS

COURSE CONTENT

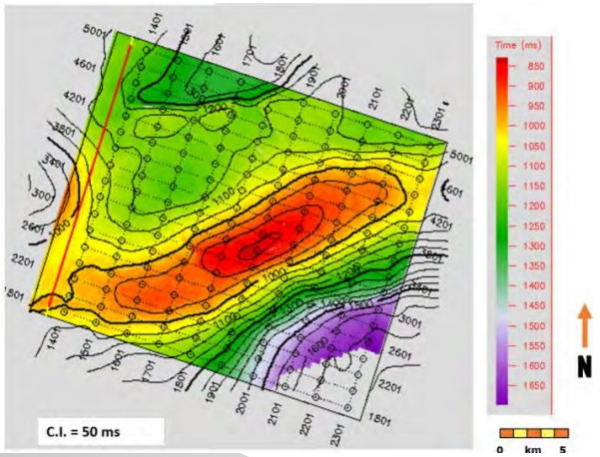
- Fundamentals of reef, margin, shelf, and slope depositional facies and play element distribution
- Relationship between structure, depositional elements, and diagenesis and its impact on reservoir quality
- Outcrop examples of well-bore to seismic-scale geologic features, stratal geometries, and sequence stratigraphic frameworks
- Implications for how seismic and outcrop datasets influence depositional models

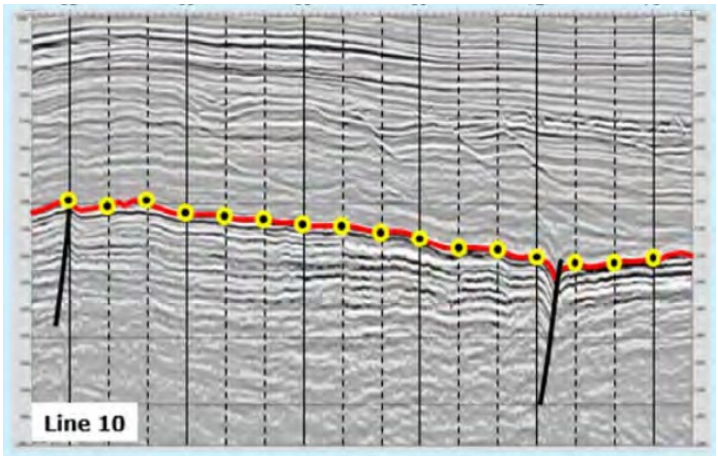
LEARNING OUTCOMES

- Analyse examples of carbonate shelf, reef margin, and basinal systems
- Relate depositional facies from outcrop to seismic-scale geometries in a sequence stratigraphic framework
- Establish frameworks to global petroleum field types
- Understand how subaerial exposure and diagenesis affect reservoir porosity and permeability
- Understand how structure controls carbonate margin development and affects post depositional diagenesis
- Identify and understand how changes in carbonate facies relate to changes in depositional environments
- Interpret carbonate sequence stratigraphic frameworks
- Make predictions of seal quality in carbonate depositional systems

Play and Prospect generation, assessment and risking
4-5 DAYS

This hands-on course enables attendees to enhance their mapping skills and their critical evaluation of plays and prospects.
This course demonstrates how to use play fairway mapping and petroleum system analyses to identify plays and prospects with high potential, even in areas with limited data. Once participants identify prospects, the course outlines how to derive geologically map based, objective inputs for prospect assessment and risking.
This stepwise approach creates well-documented results that are used to confidently rank opportunities and make smart business decisions.
Upon completion of the course, participants are able to: comprehend prospect definitions and workflows, estimate original hydrocarbons in place, delineate risk and uncertainty related to original hydrocarbon in place, reduce risk impacts, and understand fundamental concepts in regard to portfolio and resource management.





Play and Prospect generation, assessment and risking
4-5 DAYS

COURSE CONTENT

- Exploration methods and strategies
- Evaluation of petroleum assessment potential in basins
- Key workflow stages in exploration
- Subsurface mapping techniques for well and seismic datasets
- Principles of stratigraphic and structural mapping
- Generation, contouring and quality control of geologic maps
- Hands-on exercises on prospect generation and maturation
- Prospect risking strategies
- Hands-on exercises and case studies of exploration

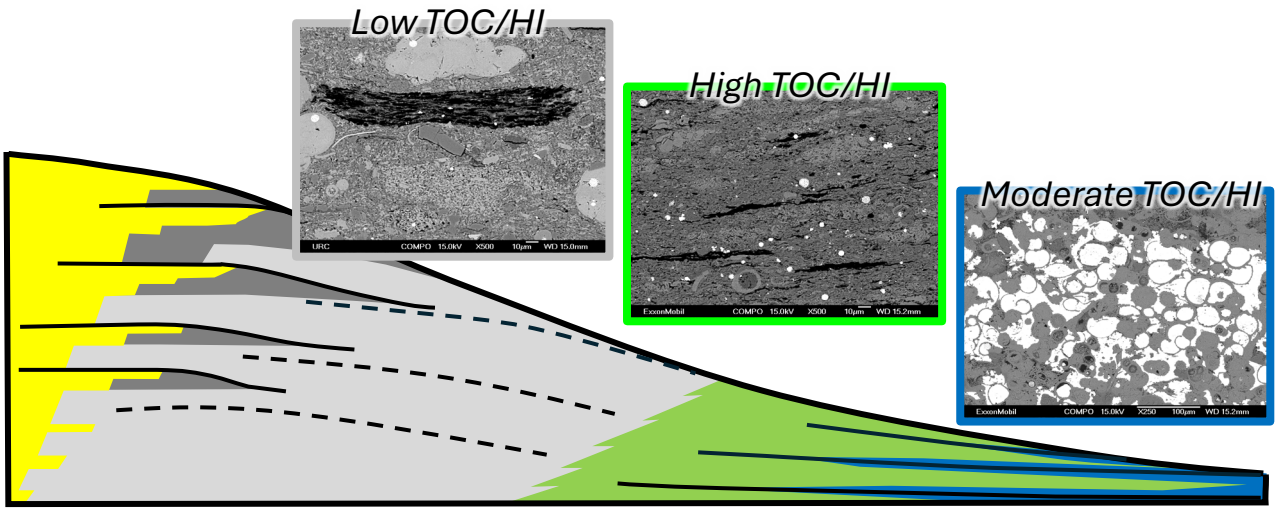
LEARNING OUTCOMES

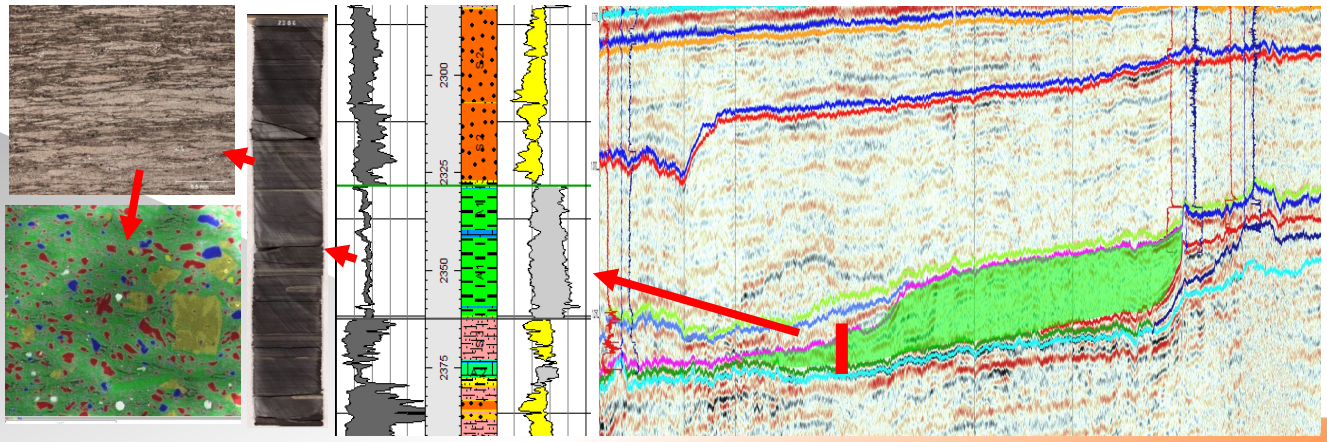
- Recall play element definitions and hone mapping skills
- Understand tectonic phases and play types with respect to the history of basin evolution
- Interpretation and integration of well and seismic data
- Subsurface mapping of prospects and maturation to drillable status
- Risk and rank prospects
- Identify and assess risks and uncertainties related to geological factors (source, reservoir, seal, trap and preservation)
- Evaluate prospect success

Monday	Tuesday	Wednesday	Thursday	Friday
Genetic Basin Evaluation	**Charge Evaluation**	**Reservoir Evaluation**	**Retention Evaluation**	**Portfolio Management**
Basin types and tectonic domains	Source Rock Types and settings	Clastic & Carbonate reservoir presence	Trap mapping and QC (structural styles)	Commodity risking
Past Venture Analysis	Hydrocarbon Maturation, Migration and Timing	Clastic and Carbonate reservoir quality	Bed Seal and Fault Seal (spill & leak) Evaluation	Geological, Geophysical, Well & Commercial CoS
Building a Genetic Basin Chart and articulate plays	Prospect Charge Risking	Prospect Reservoir Risking and Assessment	Prospect Retention Risking and Assessment	*Group Exercise: Putting it all together!*

Fundamentals of Petroleum Systems: Source, Maturation, Migration 3 DAYS

This hands-on course enables attendees to enhance their skills and critical evaluation of all aspects of hydrocarbon charge.
This includes:
Characterization of source rock presence from cores, well logs and cores and the ability to predict source adequacy from first principles.
Understand controls on source rock maturation and describe fundamental controls using burial history charts.
Learn the fundamental controls on hydrocarbon migration and apply the principles to predict hydrocarbon migration pathways and risk migration adequacy for plays and prospects.





Fundamentals of Petroleum Systems: Source, Maturation, Migration 3 DAYS

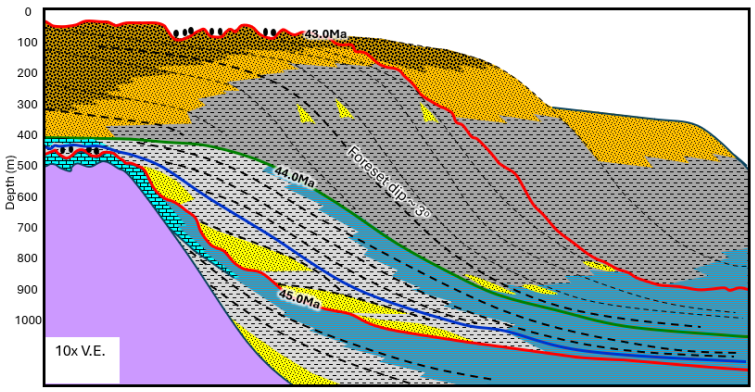
COURSE CONTENT

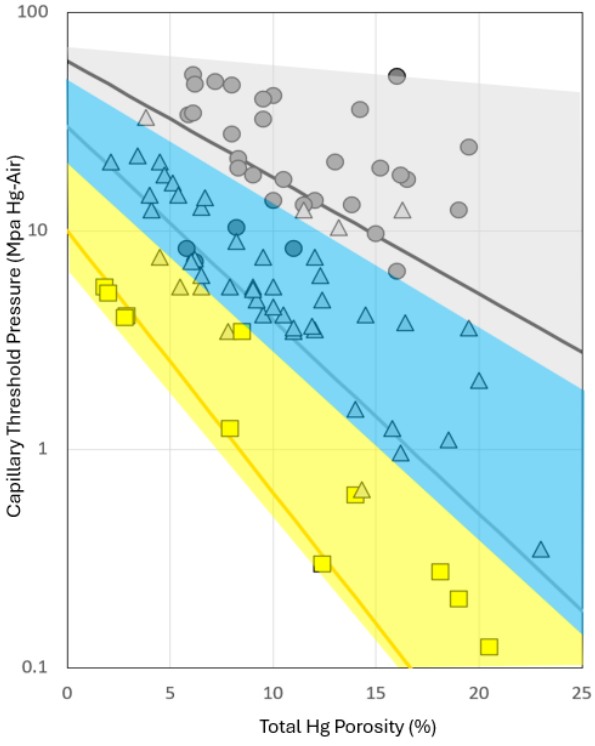
- Controls on source rock development across geologic settings
- Mapping source candidates and assess their adequacy
- Understand the fundamental controls on source rock maturation
- Use burial history diagrams to evaluate maturation timing
- Understand the fundamental controls on hydrocarbon charge
- Use maps and seismic data to describe hydrocarbon charge
- Perform risk analyses on all components of charge (source presence, maturation, migration, timing).

Module 1: Source Presence	Module 2: Source Maturation & Migration	Module 3: In reservoir-commodity and integration.
Play & Prospect Charge Adequacy Risking (Source Presence, Maturation, Migration, Timing) Source Presence Controls (Production, Destruction, Dilution Fundamentals). Source Rock Depositional and Tectonic Settings	Fundamental controls on source rock maturation. Core/Cuttings calibration of temperature and maturation. 1D Burial history modeling and calibration of wells and pseudo-wells.	Maturation and Migration timing Controls on in-reservoir commodity (oil vs. gas, including source rock type, source rock maturity, reservoir PVT and trap-seal controls on phase)
Core characterization/analyses of source richness and type. Well log characterization of source richness and maturity (DlogR). Seismic characterization of source rocks (seismic stratigraphy, facies, AVO) Source Rock Presence Risking across a range of settings and data controls	Fundamental controls on primary migration, secondary migration and migration loss. Map-based migration analyses (flow-line mapping, catchment area). Volume-based secondary migration analysis	Integrated Group Exercise (Risking all components of charge in an offshore case study)

Fundamentals of pressure, trap & seal: Retention, spill and leak of hydrocarbon fluids and CO_2

This hands-on course enables attendees to enhance their skills and critical evaluation of all aspects related to fluid pressure, flow and retention of aqueous, hydrocarbon and CO_2 fluids in the subsurface. Fluid pressure is evaluated from downhole (RFT/MDT) measurements and estimated from porosity-effective stress relationships. We make calculations of mechanical seal capacity using Leak off Test data and fundamental elastic rock properties. Capillary seal attributes are estimated from core measurements and calibrated against buoyancy pressures from oil and gas fields. Finally, these attributes are translated to other fluid systems (CO_2, H_2, He) to make predictions regarding the retention adequacy of seals.





Fundamentals of pressure, trap & seal: Retention, spill and leak of hydrocarbon fluids and CO_2

COURSE CONTENT

- Fluid pressure in the subsurface
- Buoyant immiscible fluids in the subsurface
- Mechanical Seal Evaluation
- Capillary Seal Evaluation
- Trap-Seal evaluation related to predicting fluid retention, fluid type and column heights (exploration setting).
- Trap-Seal evaluation of contacts and connectivity in a faulted reservoir setting (field development setting).

Module 1: Pressure and Seal Fundamentals	Module 2: Capillary and Mechanical Seal	Module 3: Advanced Topics Pressure/Seal	Module 4: CCS
Subsurface fluid pressure fundamentals (overpressure, underpressure, gradients, contacts and flow)	Fundamentals of mechanical seal capacity and mechanical seal failure Fundamentals of capillary seal capacity	Predicting oil and gas presence, column height distribution in exploration/appraisal settings Predicting reservoir connectivity, pressure and contact variation in a faulted reservoir.	Fundamentals of CO2 sequestration (injection, migration, retention). Case study evaluations of retention adequacy and risk associated with CO2 sequestration projects.

Siliciclastic Facies in Cores and well logs: Tools and Methods

This course introduces participants to the observational skills needed to describe clastic lithofacies, recognize vertical facies stacking patterns, and interpret key stratigraphic surfaces in core. Lectures cover all main clastic environments of deposition (EoD), core descriptions, and methods for core logging. Participants describe and identify facies in core, link core descriptions to rock properties and interpret EoD and sub-EoD. Core exercises are tied to well logs and seismic lines to correlate 1-D core information to 3-D views of reservoir-scale depositional systems. This course provides participants with the necessary skills to integrate core, well-log, and seismic data for generating high-resolution EoD maps. Group discussions and exercises also help participants understand the importance of integrating engineering data and how vital integrating geoscience data when characterizing the reservoir behavior.

Siliciclastic Facies in Core and well logs: Tools and Methods

COURSE CONTENT

- Basic concepts in clastic sedimentology
- Sedimentologic techniques for core descriptions and interpretations of lithofacies in core
- Interpret EoD and reservoir architecture for clastic depositional systems
- Interpretation of vertical stacking of facies and identifying sequence stratigraphic surfaces in core
- Interpretation and mapping techniques for core, well-logs, and seismic lines in different clastic settings at different scales
- Evaluation of reservoir geometry and connectivity across EoDs

LEARNING OUTCOMES

- Definition and recognition criteria for different clastic lithofacies, lithofacies associations and vertical stacking patterns of facies
- Recognize key stratigraphic surfaces in clastic depositional systems
- Quantify grain size by visual comparison to grain-size charts
- Qualitatively evaluate provenance, sediment maturity and distance to sediment source based on grain composition, roundness, and sorting
- Understand sedimentary processes and their resulting sedimentary structures and fabric, and how to relate processes to different lithofacies
- Correlate lithofacies described in core to well-logs
- Utilize core data to calibrate well-log and seismic data for the recognition of EoD
- Interpret and map flow units at production scale based on the integration of core, well-log and production data

Dr. Rene Jonk, Director:

Rene has more than 25 years of experience in geoscience characterization for exploration, development and research. He held technical advisor and leadership roles with ExxonMobil and Apache. He has worked extensively across offshore basins of the African and South American margins, as well as the North Sea and the Mediterranean areas. In addition, he has experience in onshore unconventional exploration and production globally. Rene holds a PhD in Petroleum Geology from the University of Aberdeen and is an honorary professor at the University of Aberdeen. He is an active member of SEPM, EAGE and the Geological Society of London.

Dr. Vitor Abreu, Advisor:

Vitor has more than 30 years of experience in the oil industry in exploration, production and research, with a proven record in evaluating, risking and drilling opportunities across 6 continents. His areas of expertise include deep water reservoirs, tectono-stratigraphic basin evolution, maturing opportunities to drillable status, and play to prospect risking assessment.

Vitor holds a PhD from Rice University and has been an Adjunct Professor at Rice University since 1999. Vitor is a past President of the Society of Sedimentary Geology (SEPM) and was the chief editor of SEPM's world-renowned book titled "Sequence Stratigraphy of Siliciclastic Systems."

Contact us:

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Classroom Course Brochure