OGAB ENGINEERING 2019 Training Courses Catalogue

CONTACT

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INTRODUCTION

OGAB Engineering Inc., based in Calgary, Alberta, Canada, is a provider of top class technology solutions and human development (competency-based training) and has been involved in facilitating and teaching both management and technical staff of national oil companies, mid-cap independents, and multinationals. Our facilitators are highly skilled industry professionals with over 20 years' experience in Field Development Planning and Optimization, Integrated Reservoir Characterization, Reservoir Reserves Analysis, Automated Integrated Reservoir Management, Well Completion Performance Monitoring and Optimization, Advanced Production Operations Surveillance, Multiphase Virtual Flow Metering Technologies, Digital Oilfield Capacity Assessment and Project Management and Facilities Engineering and Management practices and training.

OGAB Engineering Inc. goal is to offer workforce a quality training, knowledge and hands-on skill in order to perform highly critical and competency-based oil and gas jobs in the areas of Reservoir Engineering and Management, Production Engineering and Operations, Drilling Engineering and Technology, Geology and Geophysics, Advanced Petrophysics, Digital Oilfield and Petro-Technical Data Management, and Advanced Data Driven Analytics (Proxy Modeling).

Our training approach, which includes face-to-face, onsite, group training, hands-on exercises, have been tested over time and remain a huge success. This promotes employee motivation, as a well-trained and developed staff is a valuable asset to the company and increases efficiencies. The training courses will be held in the following cities around the world: Calgary (Canada), Dubai (UAE), London (UK), Houston (USA) or Accra (Ghana).

Our training programs will offer the following values to Oil and Gas professionals:

1. Improved efficiency and effectiveness in work
2. Improved productivity and profitability
3. Improved employee retention
4. Providing internationally comparable competency-based training standards
5. Ability to develop new skills in the performance of responsibilities
6. Improved health and safety capabilities

We also provide a 12-week long Oil & Gas Competency Programs meant to take an employee through a combination of theory and practice within a specific subject in an intensive 12-week long program. We offer a specialized 12 week long intensive training programs with focus on **Petroleum Engineering, Drilling Engineering, Facility & Production Engineering, Cost Engineering & Estimation, and Renewable Energy & Bio-Energy Technologies** for the oil and gas industry. During those 12 weeks, participants will be immersed in learning the how to be a Drilling Engineer, a Facility/Production Engineer, with a hands-on approach for each of the competencies, culminating in a team presentation at the end of the program, which will be evaluated by peers and industry experts. Learn the breadth and depth of knowledge in the areas of digital cost estimation and management integration. Learn the breadth and depth of knowledge in the areas of integrated renewable energy and bio-energy plant engineering analysis and design; equipment manufacturing; project development and finance; construction and installation; operations, optimization and control; and maintenance, repairs and risk management.

1. PETRO-TECHNICAL COURSES

1.1 RESERVOIR & ARTIFICIAL LIFT SYSTEM (ALS) PRODUCTION OPTIMIZATION

Course Length: **5 Days**
Course Dates: **March 4- 8, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
The objective of this course is to introduce reservoir/petroleum engineers to practical optimization algorithms and their application to solving oil and gas reservoir development optimization problems. The course covers an overview of production optimization problems in oil and gas industry followed by the presentation of practical gradient-based and stochastic optimization algorithms that are commonly applied to field development optimization problems. The course also presents the fundamental and practical aspects of production optimization and illustrates how reservoir simulation models can be integrated with optimization algorithms to perform automated/assisted field development optimization. Case studies from well flow rate control optimization and well placement planning will be discussed.

Who Should Attend?
This course is designed for professional reservoir engineers, production engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Introduction to reservoir modeling and inverse theory
- Knowledge of optimization algorithms and their application to solving oil and gas reservoir development optimization problems
- Knowledge of integrating production optimization and reservoir simulation models to perform automated/assisted field development optimization
- Use of optimization techniques, together with reservoir simulation tools, for planning and optimizing field development

Course Outline:
- Integrated geological model
- Petrophysical evaluation
- Numerical reservoir simulation
- Reservoir modeling, characterization, history matching and Forecasting
- History matching and production forecasting
- Single and multi-objective functions
- Production optimization elements
- Numerical Optimization Methods for Oil and Gas Reservoirs
- Applications of single and multi-objective optimization techniques to petroleum fields
- Methods for uncertainty estimation
- Field development optimization
- ALS system performance design and operations
- ALS production optimization and operations management.
- Field case studies and hands-on practice

1.2 FIELD DEVELOPMENT PLANNING (FDP)

Course Length: 5 Days
Course Dates: May 6 - 10, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of reservoir modeling and probabilistic methods for risk assessment and uncertainty quantification and their application to reservoir characterization, development and management. It covers a variety of topics related to the integration of production and performance data into reservoir models and account for their respective errors and uncertainties. The topics also include history matching problem formulation, deterministic and probabilistic history matching techniques, risk and decision analysis techniques, as well as common techniques for regularization and parameterization of reservoir models for history matching. Applications and case studies on risk and uncertainty management methods in field development planning will be presented and discussed.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists, asset managers and senior managers

What You Will Learn:
- Understand foundations of field development planning
- Modern petroleum risk and uncertainty management techniques
- Systematically assess relevant risks and uncertainties in FDP
- Learn to think more probabilistically
- Measure the value of seeking additional information
- Communicate and implement a consistent risk and uncertainty management policy
- Understand the value of portfolio analysis in FDP
- Develop clear guidelines for making decisions in FDP
- Better evaluate the firm's position relative to a strategic plan
- Provide a platform for communication and teamwork in the overall decision-making progress

Course Outline:
- Overview of Field Development. Field development processes and decisions
- Field development planning and optimization concepts
- Integrated reservoir characterization and modeling for field development planning
- Sources of uncertainties in reservoir performance simulation
- Fundamental concepts in probabilistic modeling for risk assessment
- History matching formulations and uncertainty quantification
- Modeling for decision analysis and options
- Modeling for risk management
- Managing risk in field development under uncertainty
- Decision Scenario Optimization (DSO)
- Case studies

1.3 PETROLEUM RESERVOIR SIMULATION TECHNOLOGIES

Course Length: **5 Days**
Course Dates: **April 8 - 12, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course addresses development of the equations for single phase and multiphase, multidimensional flow in porous media and the mathematical procedures required for their solution using finite-difference method. In particular, continuity equations for flow of several phases will be derived. Finite-difference methods based on implicit and explicit discretization will be introduced. Stability, consistency and convergence concepts will be explained in detail. Newton's method for solving the nonlinear algebraic system of equations arising from discretization of governing equations will be covered. Well models will be discussed and various ways of treating wells in simulation models will be introduced. IMPES method will be introduced and its advantages and limitations compared to fully implicit discretization will be described. Finally, compositional simulation will be introduced. Formulation, discretization and phase behavior computations will be covered. The course is designed for engineers who use reservoir simulation software as a black box on a regular basis, with limited knowledge of the underlying equations and solution methods.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Review of steps in building static and dynamic reservoir models
- Present modern reservoir simulation framework that incorporate a large variety of options which can be used to answer important questions about reservoir behavior, reservoir performance optimization, complex well design, uncertainties estimation and reservoir management
- Learn new reservoir simulation technology developments, such as unstructured gridding and reduced order modeling

Course Outline:
- Introduction to petroleum modeling and simulation workflows
- Reservoir simulation and model design concepts
- Introduction: Basic Concepts and Derivations
- Numerical solution of single-phase and multi-phase flow equations
- Well models in reservoir simulation
- Implicit pressure explicit saturation (IMPES) formulation
- Black oil and compositional reservoir simulation
- Reduced order reservoir modeling
- Use of Streamline Simulation for integrated reservoir modeling
- Aquifer modeling and Uncertainty quantification
- Applications (pressure transient test simulation, horizontal well modeling, water conning and cusping, gas field simulation, oil field simulation, volatile oil reservoir simulation, stimulated well modeling, pattern waterflood, etc) and case studies

1.4 ADVANCED INTEGRATED ASSET MODELING & OPTIMIZATION

Course Length: 5 Days
Course Dates: April 29 - May 3, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:

This course provides detailed discussions and hands-on training for building Integrated Asset Modeling to optimize production, identify bottlenecks and maximize recovery factor from oil and gas fields. The training course will provide fundamental and advanced knowledge of the Integrated Asset Modeling (IAM) components. The different type of coupling the sub-surface and surface models will be explained and all possible scenarios properly development. The benefits of using IAM as a powerful tool for reservoir management will be also extensively explain through case studies. Participants will learn how to integrate these different models together and run them all as a piece using commercial software applications. Novel workflows for thoroughly evaluating, analyzing and optimizing performance of oil and gas field/well production system components to achieve a target rates at the different states of the well/field life (early-, mid- and later-life) will also be presented. Framework to generate production optimization exploitation scenarios will also be explained in detail as well as the different types of IAM operational models. Participants will also gain the knowledge and skills to identify typical production bottlenecks, resolve and optimize it, and perform forecasting to get a better insight for future performance of the integrated asset model. Different scenarios will be reviewed and discussed to understand the potentials and limitations of integrated asset modeling as a key tool for field optimization, development, and budget planning considering surface and economic constraints.

Who Should Attend?

This course is designed for petroleum production, facility and project engineers; assets managers; reservoir managers; facility managers; project managers from oil and gas government regulatory authorities; joint venture oil and gas operators; joint venture non-operators, and others

Who Should Attend?

- Understanding the benefits of the integration of the sub-surface and surface models.
- Recognizing the IAM operation models, objectives, uses, and main applications
- Learning how to model the interactions between the reservoir deliverability and the wellbore completion.
- Understanding the benefits of Digital Oil Fields over the IAM process and decision making.
- Novel methods for generating integrated asset modeling (IAM) to improve the processes of fluid flow performance forecasting and scenarios analysis
- Integrating production data into integrated asset modeling (IAM) reservoir modeling and history matching processes
- Improving integrated asset performance management using single and multi-objective optimization methods
- Selecting the most economical time for the installation of production enhancement technologies
- Optimizing the production system to produce the objective flow rate economically
- Performing evaluations of production systems to identify different types of formation damage and ways to improve oil recovery
- Understanding the value of data and information for the decision-making process
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with integrated asset modeling and optimization

Course Content:

Integrated Asset Modeling (IAM)Overview

- Definition of IAM
- IAM Objectives
- IAM expected Benefits
- IAM deliverables, use of Integrated Asset Models for different management functions
- Overview of integrated production systems and production processes
- Type of models (reservoir, well, pipelines, compression, separation and storage) and their combination to build IAM projects
- IAM Macro Process. Integration of reservoir, wellbore, surface and economic models for diagnose, design, forecast and optimize production processes.
- IAM Operational Models: Maintenance and Reliability, Asset and Operating Integrity, Production Surveillance and Optimization, and planning and scheduling
- IAM integration with Field Development Plan Strategies
- IAM General Workflow. Step by Step procedure to connect sub-surface and surface systems
- Integrate asset model uses: risk analysis and environmental impact, production optimization, operation integrity, planning and scheduling.
- Integration of field development plans and integrated asset modeling. Uncertainty identifications, and decisions, scenario optimization.
- Case studies discussions from national oil companies (NOC) and international oil companies (IOC). Benefits quantification, recovery factor, production incremental.

Integrated Asset Modeling and Field Development Plans

- What is Field Development Planning?
- IAM as a tool to evaluate field development plans
- Optimum Field Development planning via Integrated Asset Modeling
- Field Development workflow
- Field Development Plan Framework and IAM methodology
- Deliverables in a Field Development Plan
- Importance of reserves, and Resources definition to FDP generation
- Overview of reserves estimation methods. Analogy, Volumetric, Production Performance, Material Balance, and Numeric Simulation. Criteria for method selection.
- Field development plan profit calculation. Importance of evaluating multiple scenarios via Integrated Asset Modeling
- Production optimization. What is production optimization? variable to maximize or minimize, decision variables, field development plan optimization exercises
- What Is Optimization Under Uncertainty? uncertainty definition, Uncertainties vs. Risk, uncertainty analysis, Descriptive and Inferential Statistics, Probability Distributions, type of probability distribution, estimation of mean, variance, standard deviation, kurtosis, skewness, percentiles.
- Monte Carlo simulation. Basis for Monte Carlo simulation, uses, examples in Oil and Gas projects
- Front-End Loading (FEL). How FEL and Integrated Production Modeling are complemented, FEL basis, Influencing value creation along project life cycle, the impact of new technology on production optimization and field development plans.
- Case studies discussions

Integrated Production Modeling and Optimization

- Integrated asset modeling (IAM)
    - Common constraints boundaries among reservoir, wells and facilities
    - Simultaneous vs. coupled vs. integrated
    - Commercial interface programs (e.g. Resolve, MPI)

- Preparation of IAM components – thermodynamic model, reservoir simulation model, completion-wellbore models, surface network models, surface process model, economic model
- Analyzing scenarios with the IAM
- Technical and economic evaluation of alternatives

- Practical integrated asset modeling fundamentals
  - Connecting GAP, PROSPER and MBAL
  - Connecting ECLIPSE or CMG STARS and GAP models
  - Water and gas management (conning, conformance)
- Integrated asset optimization
  - System constraints management (stretch or relax)
  - Optimal set points of wells and facilities
  - Data validation and quality control
  - Well test validation and well rate estimation
  - History matching and updating integrated assets models
  - Production forecasting
  - Production optimization elements (Single and multi-objective functions)
  - Numerical optimization methods for oil and gas reservoirs
  - Optimization formulation (objective function, decision and constraints)
  - Optimization engines and methods
  - Cost modeling and economic KPI management (NPV, RoR, $/bbl, $/bpd)
  - Production improvement opportunity decision making
- Economics in oil and gas Projects
  - Cash flow, internal rate of return, pay out time, net present value, ROCE.

Intelligent Well System Design and Optimization

- Production Optimization. Accelerate production, reduced operating costs, increase overall recovery, optimize return of investment
- Production management for petroleum reservoirs
  - Real-time reservoir and well production optimization loops
  - Fundamentals of closed-loop reservoir management
- What are intelligent/smart well completions?
- Main components of a smart or intelligent well completion
- Overview of intelligent well control equipment
- Main components of a smart or intelligent well completion
  - Sliding sleeves
  - Inflow control devices (ICDs)
  - Inflow control valves (ICVs)
  - Active flow control devices (AFCDs)
  - What ICDs, AICDs and ICVs can solve?
  - Functionalities of the ICDs, AICDs and ICVs
  - ICV, ICD examples
- Benefits of smart wells and fields (digital oilfield technologies)
- Applications of smart wells and fields (digital oilfield technologies)

1.5 OPTIMIZING INTEGRATED RESERVOIR MANAGEMENT IN MATURE FIELDS

Course Length: 5 Days
Course Dates: June 3 - 7, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:

This course provides detailed discussions and hands-on training for understanding the Integrated Reservoir Management process, workflows, process, and sub-processes normally used to optimize production, and maximize recovery factor from oil and gas fields. The training course will provide fundamental and advanced knowledge of the Integrated Reservoir Management (IRM) process which include reservoir surveillance, data acquisition plan, improved and enhanced oil recovery processes, opportunity identification, and methodology to go from lab experiments to full field implementation and optimization. The benefits of implementing IRM will be also extensively explain trough case studies, conferences, and SPE papers. Participants will learn how conduct IRM projects to achieve production goals and maximize recovery factors under different scenarios. Novel workflows, diagrams, framework for thoroughly evaluating, analyzing and optimizing reservoir to achieve production/injection targets will also be presented. The capability maturity model to define the status of IRM project also will be addresses. Participants will also gain the knowledge and skills to identify the best IOR/EOR process to be implemented in the reservoir to maximize recovery factor, improve sweep efficiency, minimize water breakthrough, and improve economic. A clear road map from lab studies to full field implementation will be presented to improve reserve extraction plan by using multi scenario evaluation approach. The course will be supplemented by practical class project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning and identify and offer solutions to specific problems associated with integrated reservoir management of oil and gas fields.

Who Should Attend?

This course is designed for reservoir, geologist, and project engineers; assets managers; reservoir managers; project managers from oil and gas government regulatory authorities; joint venture oil and gas operators; joint venture non-operators, and others

What You Will Gain:

- Understanding the benefits of the Integrated Reservoir Management (IRM).
- Understanding the IRM road map
- Recognizing the use and application of the capability maturity model to measure the current state of the IRM process.
- Learning how IOR and EOR processes can be properly articulated with IRM to maximize oil recovery
- Understanding the benefits of Digital Oil Fields over the IRM process and decision making.
- Understand the objective of a Field Integrated Laboratory Evaluation and Sector Review projects
- Defining key performance indicators for reservoir management
- How digital oil field technology support IRM strategies
- Importance of reservoir simulation models for production and injection forecast
- Understanding the impact of risk and uncertainty analysis over IRM strategies and decision-making process. Understand the importance of smart wells and completions on effective IRM
- Understanding the value of data and information in the decision-making process
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with integrated reservoir management.

Course Content:

Integrated Reservoir Management Overview

- Definition of IRM
- History of IRM, Process evolution
- IRM Goals, IRM Strategic Intent
- IRM expected Benefits
- IRM Framework, Processes, input data, output data, organizations.
- IRM deliverables, use of Integrated Asset Models for different management functions
- IRM Blocks. Data acquisition, Data QA/QC, Integration and visualization, opportunity generation, execution and monitoring
- Main IRM workflows, processes and tools
- Importance of IRM Governance
- Change management
- IRM People values, roles and responsibilities
- IRM Key Performance Indicators (KPIs)
- Capability Maturity Model for IRMM Processes and Workflows
- Integrated Asset Modeling (IAM) and IRM relationship
- Importance of IRM road map
- Case study discussion

Reservoir Surveillance

- Introduction to reservoir surveillance
    - Importance of reservoir surveillance
    - Goals of reservoir surveillance
    - Data acquisition plan. Data acquisition justification, amount and frequency of data, type of data. Data acquisition, validation and reconciliation
    - Workflow of asset strategy with work processes
    - Value of Information
    - Sample Questionnaire to Judge Quality of Information
    - Fundamentals of Value of Information (VOI)
    - Perfect and Imperfect Information
- Reservoir monitoring
    - Pressure, flow rates trend analysis
    - Voidage replacement factor. Calculations, interpretation and scenario analysis.
    - Sweep efficiency. Vertical, lateral, displacement, and volumetric seep efficiency, recovery factor.
    - Viscous fingering
    - Tracers
    - Monitoring of chemistry of production water, stiff diagrams interpretation
    - Hall plots (evaluation of injector wells performance)
    - Water and gas coning
    - Monitoring through Seismic
    - Magnetotellurics methods

- Well Monitoring
    - Cement Integrity
    - Fluid sampling (oil, water, and gas)
    - BHP, PLT, measurements
    - Hydraulic fracture productivity life
    - Thief zones and channels identification

- Skin factor. Skin factor with time,
- Transient tests, Build-up, Draw-down, interference test
  - Principle of Well testing
  - Well test types
  - Fundamental models
  - Flow regime analysis
  - Pressure buildup testing
  - Formation damage identification
  - Well Testing Applications for reservoir surveillance. Examples and class exercises.

Reservoir simulation, Opportunity Identification and Scenario Evaluations

- Identification of opportunities based on well and reservoir performance monitoring
- Base case definition. Definition of normal production decline curve
- Additional or incremental oil rate definition. Well jobs / workover justification
- Reservoir simulation
- Risk Analysis
- Opportunity and Scenario ranking. Economic evaluation of scenarios (well scale and reservoir scale), efficiency frontier method for scenario ranking.
- Production optimization. What is production optimization? variable to maximize or minimize, decision variables, optimization exercises.
- What Is Optimization Under Uncertainty? uncertainty definition, Uncertainties vs. Risk, uncertainty analysis, Descriptive and Inferential Statistics, Probability Distributions, type of probability distribution, estimation of mean, variance, standard deviation, kurtosis, skewness, percentiles.
- Monte Carlo simulation. Basis for Monte Carlo simulation, uses, examples in Oil and Gas projects
- Case studies discussions

Improved/Enhanced Oil Recovery and Sector Review Approach

- IOR and EOR definition
- Why to consider IOR/EOR process to efficiency reservoir management
- Screening of IOR/EOR methods
- Overview or EOR processes, SPE definition (miscible, immiscible, chemical, and thermal processes)
- Injection Patterns, mobility ratio and sweep efficiencies.
- Average recovery factor of IOR/EOR processes
- EOR road map. From lab design to full field applications
- Integrated laboratory evaluation
  - What is an integrated laboratory evaluation?
  - Objective of an IOR/EOR pilot project?
  - Variable to be monitored, logs, tracers
  - Lab results versus pilot results analysis
  - Reservoir heterogeneity estimation. Dykstra Parsons Coefficient, Lorentz Coefficient.
  - Reservoir heterogeneity and recovery factor relationship
  - Criteria for full field expansion
- Sector Review
  - Geological model review, facies modeling, facies continuity
  - Reservoir compartmentalization studies, geological and seismic cross-section review
  - Well types, completion types
  - Sweep efficiency calculations, action to improve sweep efficiency.
  - Voidage replacement factor estimation, analysis and action plan
  - Bubble map analysis, diagnostic plots
  - Hall plot generation and analysis
  - Saturation measurements

- Production / Injection performance dashboards

Optimizing Reservoir Management Strategies

- Depletion capacity map
- Integration of existing past records (seismic, well log, core data and geologic conceptualization) to constrain reservoir description, including structure and spatial rock property distribution models
- Initial model construction using seismic and geologic data mining to extract information from old records in mature fields
- Dynamic field connectivity characterization using historical production data, novel connectivity-based parameterization techniques and field-scale exploratory
- Updating connectivity model using new monitoring data
- Uncertainty assessment through generation of multiple models through integration of measurement and uncertainty models to generate multiple plausible geologic scenarios
- Automated injection-production production optimization workflows to maximize production and minimize bypassed oil
- In-fill and well-placement optimization
- Streamline-based simulation, history matching and production optimization under primary depletion conditions
- Streamline-based simulation, history matching and production optimization under secondary recovery processes

1.6 WATER FLOODING AND EOR PROCESSES - THEORY AND APPLICATIONS

Course Length: 5 Days
Course Dates: May 20 - 24, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:

This course provides detailed discussions and hands-on training for understanding the fundamental and main applications of waterflooding and Enhanced Oil Recovery (EOR)Processes, screening criteria, main workflows commonly used to maximize recovery factor from oil and gas fields. The training course will provide fundamental and advanced knowledge of the Waterflooding and EOR process which include EOR screening criteria, vertical and lateral sweep efficiencies, EOR pilot design, reservoir surveillance, sector models, field laboratory, opportunity identification, and methodology to go from lab experiments to full field implementation. The benefits of implementing Waterflooding and EOR will be also extensively explain trough case studies, conferences, and SPE papers. Participants will learn how conduct EOR projects to achieve production goals and maximize recovery factors under different scenarios. Participants will also gain the knowledge and skills to identify the best IOR/EOR process to be implemented in the reservoir to maximize recovery factor, improve sweep efficiency, minimize water breakthrough, and improve economic. A clear road map from lab studies to full field implementation will be presented to improve reserve extraction plan by using multi scenario evaluation approach. The course will be supplemented by practical class project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning, and identify and offer solutions to specific problems associated with integrated reservoir management of oil and gas fields.

Who Should Attend?

This course is designed for reservoir, geologist, and project engineers; assets managers; reservoir managers; project managers from oil and gas government regulatory authorities; joint venture oil and gas operators; joint venture non-operators, and others

What You Will Gain:

- Understanding the benefits of implementing waterflooding and EOR processes in reservoirs.
- Understanding the EOR screening criteria
- Understanding the IRM road map, the challenges and the importance of data acquisition
- Recognizing when implement any EOR method, its limitations, advantages and disadvantages
- Learning how Waterflooding and EOR processes can be properly articulated with IRM to maximize oil recovery
- Understand the objective of a Field Integrated Laboratory Evaluation and Sector Review projects
- How digital oil field technology support Waterflooding and EOR strategies
- Importance of reservoir simulation models for predicting waterflooding and EOR production profiles
- Understanding the value of data and information in the decision-making process
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with integrated reservoir management.

Course Content:

Day 1: Waterflooding and EOR Overview

- Introduction of EOR
- History of EOR
- Definitions of Secondary Recovery and IOR/EOR

- SPE definition (miscible, immiscible, chemical, and thermal processes)
- Maturity of EOR Processes
- Target of EOR
- Statistics of Recovery Factor by natural drive mechanisms, secondary recovery and EOR
- Case studies discussion
- Key Definitions Related to EOR
    - Incremental Oil
    - Vertical, Areal, Volumetric Sweep Efficiency, and Recovery Factor
    - Mobility Ratio, Residual Oil Saturation and Recovery Factor
    - Reservoir Heterogeneity: Dykstra Parsons coefficient, Lorentz coefficient
- Reservoir Heterogeneity and recovery factor
- Reservoir Complexity and Recovery Factor
- Discussion and Case studies

Day 2: Waterflooding and EOR Screening Criteria

- Introduction to Screening Criteria
- Waterflooding
    - Fractional flow, Oil Saturation After Water Flooding
    - Displacement efficiency, Buckley – Leverett theory and exercises
    - Recovery efficiency of waterflood, injection patterns, worldwide statistics
    - Case studies and best practices
    - Viscous fingering
    - Tracers
    - Monitoring of chemistry of production water, stiff diagrams interpretation
    - Hall plots (evaluation of injector wells performance)
    - Water and gas coning
    - Monitoring through Seismic
    - Magnetotellurics methods
- Well Monitoring
    - Cement Integrity
    - Fluid sampling (oil, water, and gas)
    - BHP, PLT, measurements
    - Hydraulic fracture productivity life
    - Thief zones and channels identification
    - Skin factor. Skin factor with time
    - Water cut versus time

Day 3: Chemical and Miscible Flooding Processes

- Polymer Flooding
    - Physics of Polymer Flooding
    - Dimensionless numbers
    - RF, RRF, Salinity, Adsorption.
- Surfactant Flooding
    - Physics of Surfactant Flooding
    - Relative Permeability Curve Considerations
    - Capillary Number definition, importance
    - Chemical Adsorption, and its impact of recovery efficiency
- Miscible Methods: Gas Injection, N2, CO2, Natural Gas
    - Phase Behavior, Minimum Miscibility Pressure
    - Lab Test to Measure Miscibility
    - Dimensionless numbers

- Kr and Pc Considerations for Miscible Process
- Guidelines for Designing Miscible Processes
- EOR for gas condensate reservoir considerations

- Case studies discussions, recovery factor discussion.

Day 4: Thermal Recovery and EOR Pilot Design

- Steam Injection
  - Continuous Steam Injection, Cyclic Steam Injection workflow, design considerations, injection patterns, well architectures to maximize steam efficiency.
  - SAGD principles, design, and configurations
- Air Injection, In Situ Combustion
- Case studies and best practices
- Integrated laboratory and EOR Pilot Design
  - What is an integrated laboratory evaluation?
  - Objective of a IOR/EOR pilot project?
  - Key considerations during EOR pilot project design
  - Selection of area for EOR pilot guidelines
  - Variable to be monitored, logs, tracers
  - Lab results versus pilot results analysis
  - Reservoir heterogeneity estimation. Dykstra Parsons Coefficient, Lorentz Coefficient.
  - Reservoir heterogeneity and recovery factor relationship
  - Criteria for full field expansion

Day 5: Surveillance and Monitoring of Waterflooding and EOR Methods, and Field Development Plan

- Injector and Producer Monitoring
- Monitoring Plots: Hall Plot, Water Oil Ratio, Voidage Replacement Factor, And Others Key Performance Indicators
- Logs used for Saturation Measurements, Tracers, Well Conformance
- Magnetotellurics Methods, 3D and 4D Seismic for Reservoir Monitoring
- Field Development Plan Guidelines
  - Field Development Plan (FDP) Guidelines for Planning
  - Fluid Injection System
  - Source, Fluid Treatment and Quality Control
  - Transport of Fluids to Injection Wells, Surface Facilities Considerations
  - Incremental Oil Cost
  - Risk Analysis
  - Environmental and Economic Aspects of EOR Methods
  - EOR Variables for Optimization
  - NPV Optimization of EOR Processes

1.7 SUBSURFACE-SURFACE PRODUCTION OPTIMIZATION

Course Length: 5 Days
Course Dates: April 1 - 5, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:

This course provides detailed discussions and hands-on training for building integrated production and well operations performance models in order to enhance and optimize oil and gas brown fields. Participants will learn how to integrate these different models together and run them all as a piece using commercial software applications. Novel workflows for thoroughly evaluating, analyzing and optimizing performance of oil and gas field/well production system components to achieve target rates at the different states of the well/field life (early-, mid- and later-life) will also be presented. Framework to generate production optimization opportunities at different levels, from reservoir and near wellbore remediation to lift performance improvement via the optimization of artificial lift and reservoir stimulation technologies will be illustrated as well. Participants will also gain the knowledge and skills to identify typical production bottlenecks, resolve and optimize it, and perform forecasting to get a better insight for future performance of the model. Different scenarios will be reviewed and discussed to understand the potentials and limitations of integrated asset modeling as a key tool for field optimization, development, and budget planning considering surface and economic constraints. The course will be supplemented by practical class project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning, and identify and offer solutions to specific problems associated with integrated production modeling and optimization for marginal fields. In addition to the core case studies built specifically to drive home the techniques and tools taught during the training sessions, other cases will be drawn from integrated production modeling and optimization value chain as the workshop proceeds.

Who Should Attend?

This course is designed for petroleum production operation, facility and project engineers; assets managers; operation managers; facility managers; project managers from oil and gas government regulatory authorities; joint venture oil and gas operators; joint venture non-operators, and others

What You Will Gain:

- Establishing the performance of a hydrocarbon producing well in natural and artificial flowing conditions
- Learning how to model the interactions between the reservoir deliverability and the wellbore completion. Rapid assessment of marginal and mature fields re-development potentials
- Identifying potential problems and warning signs from the well's operations behavior
- Recognizing different remedial actions to restore or improve well deliverability
- Novel methods for generating integrated asset modeling (IAM) to improve the processes of fluid flow performance forecasting and scenarios analysis
- Integrating production data into integrated asset modeling (IAM) reservoir modeling and history matching processes
- Improving integrated asset performance management using single and multi-objective optimization methods
- Selecting the most economical time for the installation of production enhancement technologies
- Optimizing the production system to produce the objective flow rate economically
- Performing evaluations of production systems to identify different types of formation damage and ways to improve oil recovery
- Performing PLT, build up analysis and interpretation to maintain and trouble-shoot subsurface and surface production systems

- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with integrated asset modeling and optimization

Course Outline:

Integrated Production Systems and Production Processes

- Overview of integrated production systems and production processes
- Common constraints boundaries among reservoir, wells and facilities
- Well completion and production options (vertical vs. deviated, single vs. multi-lateral, Optimization of well productivity, artificial lift systems, well Stimulation, Intelligent and complex well architectures)
- Production well test
- Gathering networks
- Hydrocarbon processing and conditioning facilities

Nodal Analysis

- Introduction to nodal analysis
- Reservoir inflow performance modeling
- Pressure drop across a perforated interval
- Modeling fluid flow in pipes and restrictions
- Heat flow modeling
- Choke performance modeling

Subsurface Surface Production Operations

- Introduction to workflows for modeling well operation problems and remedial options
- Artificial lift modeling (Gas Lift, Pump Assisted)
- Well production performance evaluation
- Petroleum production operation problems diagnosis
- Production optimization and remedial options
- Integrated subsurface surface automation and control

Integrated Production Modeling and Optimization

- Integrated asset modeling (IAM)
- Practical integrated asset modeling fundamentals
- Integrated asset optimization

Technological Trends and Integrated Information Systems

- Overview of well instrumentation technologies for well monitoring and surveillance
- Overview of intelligent well completion systems
- Overview of intelligent well control equipment
- Main components of a smart or intelligent well completion
- Benefits of smart wells and fields (digital oilfield technologies)
- Applications of smart wells and fields (digital oilfield technologies)

1.8 ADVANCED INTEGRATED RESERVOIR STUDIES

Course Length: 5 Days
Course Dates: July 15 - 19, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:

This course provides detailed discussions and hands-on training for building integrated reservoir studies which support the Field Development Plan (FDP) generations and are the main tool for reservoir characterization, surveillance, and decision-making support. The training course will provide advanced knowledge of the integrated reservoir studies cycle which include static and dynamic model generation. The static model includes the sub-models: structural, depositional environment, stratigraphy, petrophysics, geochemistry, geomechanics, fluid model, and geo-statistics. The dynamic model involves the generation of rock-fluid interaction model (capillary pressure, relative permeability curves), thermodynamic model (Black oil tables, Equation of States, miscibility concept), reservoir simulation model (grid refinement, upscaling, initialization, history matching, forecast). Once the static and dynamic model first version is generated a field development plan is formulated by using scenarios that are evaluated using the reservoir model. To select the optimum FDP several scenarios must be evaluated, and risk and uncertainty measured to rank scenarios. Different scenarios will be reviewed and discussed to understand the potentials and limitations of integrated reservoir studies as a key tool for field optimization. Participants will also gain the knowledge in data acquisition plan based on the uncertainties identified during the static and dynamic model construction. The course will be supplemented by practical class project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning, and identify and offer solutions to specific problems associated with integrated production modeling and optimization for marginal fields. In addition to the core case studies built specifically to drive home the techniques and tools taught during the training sessions, other cases will be drawn from integrated reservoir studies value chain as the workshop proceeds.

Who Should Attend?

This course is designed for geologists, reservoir engineers, any integrated study member and leaders, project engineers; assets managers; project managers from oil and gas government regulatory authorities; joint venture oil and gas operators; joint venture non-operators, and others.

What You Will Gain:

- Understand the general integrated study workflow
- Recognize the role and responsibilities of each discipline in the integrated study team
- Understand how a static model is built, workflow from the structural model to the geostatistical model.
- Understand how rock type are defined to characterize the reservoir rocks
- Petrophysical interpretation methodology, importance of conventional and special core analysis on integrated studies
- Understand how geological facies and petrophysical properties are distributed in the grid, use of variograms, Krigging technics and gaussian simulations.
- Understand the type of reservoir according to its phase diagram, PVT Lab tests, when use compositional model or black oil model, equation of state guidelines for grouping and splitting.
- Understand the main concept of reservoir simulation, initialization objective, history matching workflow, prediction consideration
- Understand the importance of geochemistry and geomechanics to validate Integrated Studies
- How formulate scenarios using reservoir simulation
- Understand the process to select the optimum Field Development Plan
- Understand the FEL methodology for FDP formulation

- Using case studies, group exercises and interactive group discussion to have a big picture of the uses and benefits of integrated studies

Course Content:

The Course content cover the entire workflow for integrated studies generation based on the content below which cover the task from generation of static model to dynamic models (reservoir simulation) and uses of reservoir simulation scenarios to formulate optimum field development plans.

- Integrated Reservoir Studies overview and Data Management
- Static Model construction, Geophysics, Geomechanics, Geochemistry and Geology
- Static Model construction, Petrophysics and Ge-ostatistics
- Reserve estimation and methods
- Reserve estimation methods
- Dynamic Modeling, PVT validation, PVT tests, and Equation of state generation
- Reservoir Simulation
- Field Development Plan. Part- 1
- Field Development Plan- 2
- Reservoir Simulation and Field Development workshop

1.9 WELL TEST – DESIGN AND ANALYSIS

Course Length: **5 Days**
Course Dates: **June 3 - 7, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course will address how transient flow of reservoir fluids (natural gas or oil) enables characterization of the well damage or stimulation and of the well drainage area. The course will show how parameters quantified from rate and pressure transient analysis enable well performance enhancement through improved new well and workover designs. Applications and case studies of well testing technologies will be presented and discussed.

Who Should Attend?
This course is designed for reservoir engineers, production engineers and asset managers

What You Will Learn:
- Basic well testing including flow tests and pressure transient analysis. Flow tests provide an empirical characterization of gas well deliverability. Pressure buildup transient analysis quantifies non-Darcy flow and characterizes well damage or stimulation and the well drainage size and shape
- Pressure transient analysis of hydraulically fractured and horizontal wells and long-term production data analysis from rate and pressure data

Course Outline:
- Introduction to gas well testing, flow and buildup tests
- Diffusivity Equation derivation; natural gas pseudo potential, non-Darcy flow
- Gas well flow testing including back pressure tests, isochronal and modified isochronal tests
- Pressure buildup analysis for diagnosis and characterization of damage and stimulation
- Non-Darcy flow characterization; relationship between flow test and transient test analyses
- Pressure buildup analysis for horizontal well characterization
- Pressure buildup analysis hydraulically fractured well characterization
- Pressure buildup analysis of reservoir limits to characterize well drainage size and shape
- Empirical rate transient analysis; Arps and other decline curve models
- Rate and pressure analysis for quantifying well and well drainage characterization
- Class exercises
- Field case studies

1.10 INTEGRATED CORE AND WELL LOG DATA INTERPRETATION FOR RESERVOIR CHARACTERIZATION

Course Length: 5 Days
Course Dates: March 11 - 15, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Analyzing data derived from well logging and core-plug to understand the heterogeneity of reservoir properties in geologic formations is paramount in petrophysical rock classification and characterization. This course aims to present various concepts of core and well log data acquisition, analysis, interpretation, integration, and their use in petroleum exploration and production. On completion of the course, the participants will be able to: (i) interpret well logs and core data to estimate petrophysical and compositional properties of different formations (ii) understand the physics of nuclear, electric, electromagnetic, nuclear-magnetic, acoustic, imaging, technical, LWD and MWD logs (iii) understand core and plug data acquisition and analysis (iv) understand the principle of petroleum geo-statistics for reservoir characterization (v) perform geo-statistical integration of core-plug and well log data to build accurate models describing porosity, permeability and saturation distributions in reservoir modeling and simulation. The course includes extensive hands-on training and problem solving using public domain software.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists.

What You Will Learn:
- Significance of core data in petrophysical rock classification and characterization
- Reservoir description with well log-based and core calibrated-based petrophysical rock classification
- Assessment of static petrophysical properties using core & well logs data interpretation
- Construction of static and dynamic multi-layered petrophysical models for petroleum reservoirs
- Joint inversion of well logs & cores to assess petrophysical properties of multi-layered formations
- Pore scale models for simulation and estimation of petrophysical properties
- Link to core-based calibration and updating in petrophysical reservoir characterization
- Geo-statistical characterization of petroleum reservoirs

Course Outline:
- Introduction to reservoir rock petrophysical properties
- Well logging and logging analysis
- Standard and special core analysis
- Core-well log integration synchronization and workflow
- Integrated formation evaluation and reservoir characterization
- Assessment of net sand/pay, resources, and reserves

1.11 RISK AND UNCERTAINTY MANAGEMENT IN FIELD DEVELOPMENT PLANNING (FDP)

Course Length: 5 Days
Course Dates: July 8 - 12, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of probabilistic methods for risk assessment and uncertainty quantification and their application to reservoir characterization, development and management. It covers a variety of topics related to the integration of production and performance data into reservoir models and account for their respective errors and uncertainties. The topics also include history matching problem formulation, deterministic and probabilistic history matching techniques, risk and decision analysis techniques, as well as common techniques for regularization and parameterization of reservoir models for history matching. Applications and case studies on risk and uncertainty management methods in field development planning will be presented and discussed.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists, asset managers and senior managers

What You Will Learn:
- Understand foundations of modern petroleum risk and uncertainty management techniques
- Systematically assess relevant risks and uncertainties in FDP
- Learn to think more probabilistically
- Measure the value of seeking additional information
- Communicate and implement a consistent risk and uncertainty management policy
- Understand the value of portfolio analysis in FDP
- Develop clear guidelines for making decisions in FDP
- Better evaluate the firm's position relative to a strategic plan
- Provide a platform for communication and teamwork in the overall decision-making progress

Course Outline:
- Reservoir modeling for field development planning
- Sources of uncertainties in reservoir performance simulation
- Fundamental concepts in probabilistic modeling for risk assessment
- Uncertainty quantification with probabilistic reservoir modeling
- Geo-statistics for stochastic reservoir characterization
- History matching formulations
- History matching techniques for uncertainty reduction
- Regularization and parameterization for addressing data limitation
- Model-based field development planning
- Modeling for decision analysis and options
- Modeling for risk management
- Managing risk in field development under uncertainty
- Case Studies

1.12 WELL LOG INTERPRETATION

Course Length: 5 Days
Course Dates: August 5 - 9, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This is an applied training course that is designed to equip participants with professional skill sets they need to evaluate drilling wells, estimate reserves, and evaluate assets for performance status monitoring, acquisition and/or disposal. The training course covers current challenges in well-log interpretation and modern techniques for well-log interpretation and formation evaluation. The training accommodates a wide range of background, educational and experience levels. Experience levels have ranged from little Geoscience, or Petroleum Engineering exposure to petroleum industry veterans, with several years of practical experience. The goal of this training course is to keep the class level basic enough to accommodate the skill sets of those participants with little Petroleum E&P background, while still keeping the class interesting for industry veterans.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists.

What You Will Learn:
- Interpret well logs and core data to estimate petrophysical and compositional properties of different formations
- Understand the physics of nuclear, electromagnetic, and acoustic logs.
- Analyze the effect of static (e.g. porosity, volumetric concentration of shale, water saturation, and volumetric concentrations of mineral constituents) and dynamic (e.g. permeability and saturation-dependent capillary pressure) petrophysical properties on well logs
- Evaluate the quality of well logs & estimate petrophysical and compositional properties
- Use well logs to identify rock types for quantifying reservoir quality
- Make decisions for good candidate locations for completion and fracture treatment based on combined interpretation of well logs and core data

Course Outline:
- Introduction to well logging techniques and review on petrophysical concepts
- Quick-look and reconnaissance well log interpretation methods
- How to use gamma ray logs, spontaneous potential logs, density logs, PEF logs, neutron logs, acoustic logs, NMR logs, caliper, tension and temperature logs
- cross-plots techniques and some useful short cuts
- Modern techniques for well-log interpretation and formation evaluation
- Assessment of static and dynamic petrophysical properties based on combined interpretation of well logs and core data
- Well log-based and core calibrated petrophysical rock classification techniques and their use reservoir characterization
- Inversion-based petrophysical interpretation of advanced well logging measurements

1.13 LARGE-SCALE FIELD DEVELOPMENT OPTIMIZATION

Course Length: 5 Days
Course Dates: June 17 - 21, 2019 (Adjustable)
Course Venue: Calgary (Canada), Toronto (Canada), Vancouver (Canada), or Houston, Texas, USA
Amount: US$4,900

Course Description:
A typical reservoir development problem involves many variables that affect the operational schedule involved in its management subject to economic and physical limits. It is therefore essential these operations be performed as close to optimal as possible. This course is designed to equip participants with computational methods to solve field development problems. Field cases involving well control optimization, well placement and generalized field development full field development are presented to gain hands-on experience and best practices in the industry.

Who Should Attend?
This course is designed for professional reservoir engineers, production engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Introduction to reservoir modeling and inverse theory
- Knowledge of optimization algorithms and their application to solving oil and gas reservoir development optimization problems
- Knowledge of integrating production optimization and reservoir simulation models to perform automated/assisted field development optimization
- Use of optimization techniques, together with reservoir simulation tools, for planning and optimizing field development

Course Outline:
- Integrated geological model
- Petrophysical evaluation
- Numerical reservoir simulation
- History matching and production forecasting
- The objective function
- Overview of optimization techniques
- Multi-objective optimization techniques
- Applications of single and multi-objective optimization techniques to petroleum fields
- Methods for uncertainty estimation
- Reservoir management decisions
- Field case studies and hands-on practice

1.14 FAULT SEAL ANALYSIS IN PETROLEUM EXPLORATION AND DEVELOPMENT

Course Length: 5 Days
Course Dates: April 22 - 26, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
In reservoir settings with structural compartmentalization, fault properties can constrain fluid flow and pressure development, thus affecting decisions associated with the selection of the drainage strategy within the reservoir management activities. This course covers the basic and advanced concepts in fault seal analysis in petroleum exploration and production. The course also includes extensive hands-on training and problem solving using public domain software.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Quantification and characterization of faults (fault mapping techniques)
- Fault facies and its application to petroleum reservoirs
- Relation between faults and hydrocarbon migration
- Influence faulting on hydrocarbon migration (fault clay content predictions)
- Faults and hydrocarbon migration model (fault seal theory and controls on flow)
- Fault statistics, fault diagnosis, fault geometric & juxtaposition analysis
- Fault properties analysis and its application to reservoir models

Course Outline:
- Introduction to tectonic evolution, and development of fault zones and fault rocks
- Fault seal process, fault seal types and generated fault rocks
- Methods to evaluate fault sealing properties
- Dynamic fault evolution and deformation mechanisms
- Factors affecting petrophysical properties of fault rocks
- Zone properties modeling and layering process
- 3-D stratigraphy modeling and faulted cellular models
- Fault zone architecture, fault framework construction & fault seal analysis
- Fault and fracture prediction
- Uncertainty associated with fault sealing analysis
- Workflow for quantitative evaluation of structural compartmentalization reservoir fault communication using 4D Seismic Data
- Field case studies and hands-on practice

1.15 WELL PLANNING AND DRILLING OPTIMIZATION

Course Length: 5 Days
Course Dates: May 20 - 24, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course will equip participants with knowledge and skills necessary to ensure that well plans lead to the lowest well costs while still achieving production or exploration goals. This course uses a balanced combination of lecture, discussion and case studies where participants will learn how to apply technical limit principles to guide well planning, develop a risk-weighted well cost estimate, create well plans that explicitly identify and manage risk, audit and select rigs, create contingency plans (oil spill contingency plans, safety cases and joint operation manuals) using well's specific objectives, plans and previous fillings, and conduct post analysis that documents the root of unscheduled events and lessons earned.

Who Should Attend?
This course is designed for professional drilling engineers, production engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Knowledge of key characteristics and challenges of well engineering from a well design, planning, construction and operational perspective
- Knowledge of modeling drilling processes based on industry best practices. Both steady state and dynamic models of the drilling processes
- Knowledge of different frameworks for optimizing the drilling processes
- How to apply technical limit principles to guide well planning
- Use number of popular industry software packages to demonstrate the concepts explained during lectures

Course Outline:
- Designing an Oil and Gas Wells
- Formation Pressures and Formation Strength
- Drilling Fluid and Cementing Program
- Drill bit Selection, Downhole Drilling Equipment and Drilling Hydraulics
- Well Perforation
- Borehole Problems
- Introduction to Drilling Process Optimization
- Key Performance Indicators
- Optimization of Drilling Process Parameters
- Drilling Optimization Workshop

1.16 HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT FOR FIELD DEVELOPMENT PROJECTS

Course Length: 5 Days
Course Dates: June 10 - 14, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course deals with the fundamental HSE concepts and ways of putting in place effective HSE management systems. Practical examples will be presented to assist participants in developing pertinent skill sets.

Who Should Attend?
This course is designed for professional reservoir engineers, production engineers, facility engineers, asset managers

What You Will Learn:
- Understand national/local HSE legislation and the roles of standards
- Understand the different HSE management systems available
- Design of an effective HSE management systems
- Fundamentals of risk assessment and the role of safety regulations
- The Principles and applications of safety life cycle for petroleum project management
- How to use fault tree analysis to predict accident rates and failure rates
- The meaning and implications of safety integrity levels (SILs)
- The knowledge and skills to plan, implement and evaluate stages of a range of HSE management systems
- How to apply latest knowledge of HSE management systems and best practices into organizational business decisions and operations
- Assess the role of HSE management systems in the success of a maintenance plan

Course Outline:
- Overview of the oil and gas exploration and production process
- Overview of HSE programs and management systems
- Overview of HSE regulations and issues
- Safety life cycle models
- Risk assessment and management processes
- Hazard identification and risk management techniques
- Application software for risk and safety management
- Fundamentals of alarm management and their implementation
- Properties and effects of wastes
- Waste treatment and disposal methods
- HSE management systems and their implementation
- Fundamentals of reliability analysis
- Best practices

1.17 INTEGRATED RESERVOIR STUDIES

Course Length: 5 Days
Course Dates: April 15 - 19, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the processes and workflows for performing integrated reservoir studies using geological, geophysical, petrophysical and engineering data. The course highlights concepts pertaining to reservoir description, reservoir modeling and simulation, reservoir production optimization, and economic and uncertainty analysis. The course also includes extensive hands-on training and problem solving using public domain software.

Who Should Attend?
This course is designed for project engineers, geoscientists, reservoir engineers, production engineers, petroleum engineers, planning and development analysts, business planner, senior/ executive managers

What You Will Gain:
- How to work together on a multidisciplinary team consisting of geophysicists, geologist, petrophysicists, and petroleum engineers
- Understand the workflow for conducting integrated reservoir studies, including the components of a study and data required
- How to perform a complete description of a hydrocarbon reservoir (static reservoir model) using geo-scientific, geo-statistical and engineering methods
- How to design, construct, execute and quality check an integrated reservoir simulation model given a geological, geophysical, seismic, electromagnetic, well log and production data
- How to predict and optimize reservoir performance using reservoir simulation, economic modeling and uncertainty assessment. How to document results of integrated reservoir studies

Course Outline:
- Overview and objectives of integrated reservoir studies. Workflow for integrated reservoir studies. Geological description (facies, mapping, etc). Geophysical description
- Spatial and structural modeling. Facies/rock type modeling
- Introduction to reservoir rock petrophysical properties. Estimation of properties at well locations.
- Well logging and logging analysis. Standard and special core analysis
- Core-well log integration synchronization and workflow
- Integrated formation evaluation and reservoir characterization
- Reservoir model construction and calibration. Ranking of realizations
- Economic and risk analysis
- Project management applications to integrated reservoir studies
- Field Case Studies

1.18 INTELLIGENT OIL & GAS FIELDS MODELING AND OPTIMIZATION

Course Length: 5 Days
Course Dates: July 22 - 26, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course provides a comprehensive overview of advanced intelligent completions for oil and gas wells. The benefits and multiple applications of the intelligent wells will be discussed. Design methodologies of completing intelligent wells will also be emphasized with multiple hands-on field examples.

Who Should Attend?
This course is designed for professional petroleum engineers, reservoir engineers, production engineers, operation engineers, drilling engineers and asset managers

What You Will Learn:
- Learn about Intelligent Well Completion Systems components: from downhole sensors and actuators (ICV, ICD and mechanically driven sleeves)
- Provide design methodologies of completing intelligent wells
- Hands-on exercises on intelligent well Modelling and Value Quantification to build nodal analysis models to determine the desired behavior of remote actuators
- Hands-on training of Intelligent field Modelling and Value Quantification
- Optimal operating strategy for wells with downhole inflow control technologies
- Provide a general overview of Digital Oilfield and Real-time production optimization by sharing the best practices and lessons learned after 10 years of digital oilfield (DOF) implementations

Course Outline:
- Overview of intelligent or smart well technologies. Economics of intelligent wells
- Intelligent well components and their potential applications
- Selection between passive & active downhole flow control technologies
- Intelligent well completion performance modeling and optimization using nodal analysis
- Comprehensive workflow for the design of intelligent well completions
- Intelligent field modeling and value quantification using modeling tools
- Comprehensive workflow for the design of advanced well completions and field development well configuration
- Automated optimization strategies for integrated intelligent well placement and design in oil fields
- Workflow for uncertainty reduction in intelligent field development planning
- Flow estimation & allocation using downhole pressure and distributed temperature data
- Using distributed downhole measurements to optimize production in intelligent wells
- Closed loop monitoring and optimization of intelligent well operations performance
- Class exercises and field case studies

1.19 INTEGRATED PRODUCTION AND WELL OPERATIONS MODELING - RAPID PERFORMANCE ASSESSMENT OF MARGINAL AND MATURE FIELDS

Course Length: 5 Days
Course Dates: August 19 - 23, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
The five days course provides detailed discussions and hands-on training for building integrated production and well operations performance models using commercial software applications. The training course will provide fundamental and advanced knowledge of integrated production and well operations modeling components, beginning with the static reservoir pressure, inflow performance, flow across the completion, up the tubing string, surface choke, horizontal flow lines, and into the separator. Novel workflows for thoroughly evaluating, analyzing and optimizing performance of oil and gas field/well production system components to achieve an objective rate at the different states of the well/field life (early-, mid- and later-life) will also be presented. Framework to generate production optimization opportunities at different levels, from reservoir and near wellbore remediation to lift performance improvement via the additional and optimization of artificial lift will be illustrated as well. Applications and case studies of multiple petroleum production technologies will be presented and discussed.

Who Should Attend?
This course is designed for reservoir engineers, production engineers, facility engineers and asset managers

What You Will Learn:
- Establish the performance of a hydrocarbon producing well in natural and artificial flowing conditions
- Learn how to model the interactions between the reservoir deliverability and the wellbore completion. Rapid assessment of marginal and mature fields re-development potentials
- Identify potential problems and warning signs from the well's operations behavior
- Recognize different remedial actions to restore or improve well deliverability

Course Outline:
- Introduction to integrated production modeling (IPM) suite. Data validation and reconciliation.
- PVT properties modeling. Inflow and outflow (multiphase) performance modeling. Choke & network performance modeling. System (nodal) analysis concepts. Estimation of OOIP & GIP
- Facility modeling (compressor, pumps, pipelines, valves, etc)
- Integrated production model calibration and updating. Calibrated production forecasting based on well performance. Scenario, sensitivity, risk and uncertainty analysis. Liquid loading in the wellbore and near reservoir condensate dropout. Well performance analysis
- Workflows for modeling well operation problems and remedial options. Artificial lift systems
- Optimization of well productivity. Well Stimulation. Intelligent and complex well architectures
- Class exercises and field case studies

1.20 SUBSEA COMPLETIONS & DEEPWATER TECHNOLOGY

Course Length: **5 Days**
Course Dates: **March 25 - 29, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
The course is designed to provide an overview of subsea completions & deepwater equipment in the oil and gas industry. The participants will learn about the subsea completions deepwater design options to meet deliverability, safety and integrity requirements in completions and workover operations. The main components of a subsea well completions are described and analyzed by their function and design criteria. Participating will also learn to calculate tension, compression, burst, collapse, yield and threshold strength. This course covers all the relevant subjects needed to describe structural mechanics of downhole tubular. The course will give participants the Case studies will be provided to help the participants understand the hands-on aspects of subsea completions and deepwater technologies.

Who Should Attend?
This course is designed for reservoir engineers, production engineers and asset managers

What You Will Learn:
- Proficiency and confidence that is needed to design safe and cost-effective subsea well completions and production systems including the key components
- Learn how to select the optimum completion option for the type of reservoirs and general operational procedures for preparation and start up
- Detailed understanding of the issues and the physics of sand producing reservoirs
- Gain knowledge on how to identify the problems associated with sanding: when it will happen, mode of occurrence, volumes of sand and risk presented by these types of reservoirs
- Importance of deepwater technology for oil and gas production. Different structural and platform types. Main engineering principles for deepwater technology
- Design and operation of fixed and floating structures often used in harnessing oil and gas resources in deepwater/offshore environments

Course Outline:
- Introduction to subsea well completions. Workflows for subsea well completions design
- Designing Well Completion for the Life of the Field
- Subsea well completions equipment selection. System approach to casing and tubing design
- Subsea well perforations technologies. Production Packers. Subsurface Safety Valves
- Subsea well completion performance analysis of well with and without downhole flow control technologies
- Physics of sand producing reservoirs. Sand stabilization and exclusion. Sand production management completion design
- Subsea well completion performance analysis of well with and without sand control technologies
- Subsea Wellheads, Xmas Trees and Connectors. Subsea Manifolds, Pipelines and Flowlines
- Offshore Structures and Operations. Principles of Mooring Analysis and Riser Design
- Class exercises and Field case studies

1.21 HORIZONTAL & DIRECTIONAL DRILLING: DESIGN AND ANALYSIS

Course Length: **5 Days**
Course Dates: **March 11 - 15, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course builds a firm foundation in the principles and practices of horizontal and directional drilling, calculations, and planning for directional and horizontal wells. Specific problems associated with directional/horizontal drilling such as torque, drag, hole cleaning, logging and drill string component design are included. Participants will receive instruction on planning and evaluating deviated and horizontal wells and learn how to perform simple calculations associated to well survey. The basic applications and techniques for multi-lateral wells are covered in the course. Additionally, participants will become familiar with the tools and techniques used in directional drilling such as survey instruments, bottomhole assemblies, motors, steerable motors and steerable rotary systems. Participants will be able to predict wellbore path based on historical data and determine the requirements to hit the target.

Who Should Attend?
This course is designed for professional drilling engineers, production engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Knowledge of key characteristics and challenges of horizontal and directional engineering from a well design, planning, construction and operational perspective
- Knowledge of horizontal and directional modeling drilling processes based on industry best practices. Both steady state and dynamic models of the drilling processes
- Knowledge of different frameworks for optimizing the horizontal and directional drilling processes
- How to apply technical limit principles to guide horizontal and directional well planning
- Use number of popular industry software packages to demonstrate the concepts explained during lectures

Course Outline:
- Formation pressures and formation strength
- Introduction to horizontal and directional wells. Directional drilling design workflow
- Long, Medium, Short and Extreme Directional Wells
- Directional Drilling Tools
- Drill bit selection, downhole drilling equipment and drilling hydraulics
- Drilling fluid and cementing program
- Measurement while Drilling (MWD), Logging while Drilling (LWD), and Geo-steering
- Horizontal and directional borehole problems
- Optimization of horizontal and directional process parameters
- Horizontal and directional drilling optimization Workshop

1.22 APPLIED GEO-STATISTICS FOR RESERVOIR MODELING AND CHARACTERIZATION

Course Length: **5 Days**
Course Dates: **June 17 - 21, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course addresses the application of geo-statistical techniques to build reservoir models through the integration of geological, core/well log, seismic and production data to generate a consistent reservoir description. It will introduce reservoir modeling workflow from construction of the 3D static reservoir model through up-scaling and dynamic reservoir simulation. The course provides background and insights to geo-statistical modeling techniques and the situations where the application of geo-statistics could add value. It will also provide guidance in the assembly and analysis of the required data for geo-statistical techniques and the resulting numerical models. The course includes extensive hands-on training and problem solving using public domain software.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Review of steps in building static reservoir model
- Decision making under uncertainty
- Variogram definition, calculations and physical meaning
- Simple and ordinary kriging
- Conditional simulations/sequential approaches
- Indicator simulation of lithofacies
- Point & block estimation
- Integration of seismic data
- Up-gridding and Up-scaling
- Experimental design and applications
- Flow simulation through geologic models using streamlines
- History matching- preliminaries

Course Outline:
- Introduction to petroleum geo-statistics in reservoir characterization and modeling
- Review of probability and distributions
- Covariance and correlation, analysis of spatial continuity, variogram definition, calculations and physical meaning
- Modeling & interpreting the variogram
- Cokriging/Collocated Cokriging
- Boolean/Object-based models
- Multidisciplinary data integration
- Field case studies and hands-on practice

1.23 INTEGRATED ASSET MODELING & OPTIMIZATION

Course Length: 5 Days
Course Dates: April 1 - 5, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course provides an overview of integrated asset modeling (IAM), its concept and significance to enhance and optimize complex oil and gas field systems. The course also equips participants with knowledge and skills necessary to create and maintain an integrated asset modeling tools using multiple software applications to build models for thermodynamic, reservoirs, completion-wellbores, surface pipeline networks, surface process equipment and economic, respectively. The main focus is to learn how to build these models from the scratch and understand the theory and concept behind them. Participants will learn how to integrate these different models and run them all as a piece. It will also highlight methodology to detect, resolve and optimize bottlenecks, and perform forecasting to get a better insight for future deterministic and probabilistic performance of the model. It also reviews different hydrocarbon production optimization methods for single and multi-reservoir fields. Different scenarios will be reviewed and discussed to understand the potentials and limitations of the IAM as a key tool for field optimization, re-development, and budget planning. Case studies will be discussed to illustrate the field application of the concepts in the course.

Who Should Attend?
This course is designed for reservoir engineers, production engineers, facility engineers and asset managers

What You Will Learn:
- Novel methods to generate integrated asset modeling (IAM) to improve the processes of fluid flow performance forecasting and scenarios analysis
- Integration of production data into integrated asset modeling (IAM) reservoir modeling and history matching processes
- Improving integrated asset performance management using single and multi-objective optimization methods

Course Outline:
- Introduction to integrated asset modeling (IAM) & optimization
- Initial data review and integrated reservoir development workflow
- Preparation of IAM components – thermodynamic model, reservoir simulation model, completion-wellbore models, surface network models, surface process model, economic model
- Model integration and software application (automated workflow construction and configuration)
- Hydrocarbon production optimization methods in single and multi-reservoir fields
- Multi-reservoir production performance simulation-optimization workflow under uncertainties
- Analyzing scenarios with the IAM. Technical and economic evaluation of alternatives
- Field development and/or re-development planning issues
- Field case studies and hands-on practice

1.24 INVERSE-BASED SEISMIC INTERPRETATION FOR PETROLEUM RESERVOIR CHARACTERIZATION

Course Length: **5 Days**
Course Dates: **July 8 - 12, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course addresses mathematical methodologies for seismic reservoir characterization in order to provide 3-dimesentional models of the main properties in the reservoir for fluid flow simulations and enable 4D reservoir modeling characterization by time-lapse seismic data integration. These properties generally include rock properties such as porosity, lithology, water and hydrocarbon saturations, pressure and permeability are estimated from well log and seismic data. This course includes multiple innovative and sate of the art inverse modeling methodologies for seismic reservoir characterization: Case studies will be discussed to illustrate the field application of the concepts in the course.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Definition of the rocks. Clastics sedimentology basics
- Concept of stress and strain. Stress –strain relationships. General Hooke's law
- The connections between Young Modules, Poisson's ratios and Thomson's parameters
- Velocity-Porosity Models: Critical Porosity and Nur's Modified Vogt Average.
- Velocity-Porosity-Clay Models: Castagna's Empirical Relations for Velocities
- Vp –Vs Relations. Velocity-Density Relations
- Updating a reservoir model to behave as closely as possible to the real reservoir
- Estimation of reservoir properties using inversion methods

Course Outline:
- Introduction to Reservoir Modeling and Inverse Theory
- Rock Physics and seismic methods for characterizing petroleum reservoirs
- Mathematical modeling of elastic properties of minerals and rocks
- Seismic waves in real media and fluid effects on wave propagation
- Seismic based reservoir characterization
- Seismic data processing and conditioning
- Forward modeling and inverse problem. Travel –time inversion
- Dynamic data integration and history matching with 4D Seismic Data
- Micro-seismic events. Analysis raw data
- Estimation of permeability base on MS event locations
- Permeability upscaling: from lab to field
- Field case studies and hands-on practice

1.25 EMERGENCY PREPAREDNESS: COMMAND AND CONTROL

Course Length: 5 Days
Course Dates: August 5 - 9, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description

With disasters increasing in frequency and costs each year, there is increasing need to improve effectiveness of incident command and control systems for emergency preparedness. This course will teach participants principles of emergency management (preparedness and response) and the industry best practice of incident command and control system design, operations, structure and development process to keep communities and industry safe. The course will also provide activities and exercises that build the participants: abilities to perform the tasks and responsibilities of the emergency manager's role; create long-term strategies for emergency management; design and operate command and control systems to select mitigation solutions to hazard risk problems and carry out mitigation activities in a post-disaster environment. Practical examples will be presented to assist participants in developing pertinent skill sets and the abilities to apply the skills and information gained in this training course.

Who Should Attend?

This course is designed for professional engineers, asset managers, all members of emergency management team, emergency service personnel, etc.

What You Will Learn

- Fundamentals of emergency preparedness & and their roles in keeping communities and industry safe
- Principles & applications of command and control systems for emergency response management
- Understand the different command and control systems available in emergency management
- Design and operations of an effective command and control systems for managing emergency events
- The knowledge and skills to plan, implement and evaluate stages of a range of command and control systems for managing emergency events
- How to apply latest knowledge of command and control systems and best practices into organizational emergency management business decisions and operations
- Assess the role of command & control systems in the success of an emergency management plan

Course Outline

- Overview of emergencies preparedness and response systems. Overview of emergency response programs & management systems. General problems associated with emergency response in large-scale disasters (emergency management - preparedness and response)
- Anticipating potential hazards and threats hazardous products in E & P operations for emergency planning, warning and response purposes in an area
- Fundamentals of command and control system, and their implementation
- Description, necessity and roles of command and control systems in emergency management
- Components and operation of command and control system for managing emergency events
- Best practices on command and control system applications in emergency events mitigation and management

1.26 AUTOMATION AND CONTROL TECHNOLOGY: THEORY AND PRACTICE

Course Length: **5 Days**
Course Dates: **September 9 – 13, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
In today's environment, the upstream petroleum industry business is becoming more and more competitive and every operator is looking for the best quality products at minimum operating and investment costs. The traditional PID loop is used frequently for much of the process control requirements of an intelligent field development. However there are many drawbacks in using these, including excessive dead time which can make the PID loop very difficult (or indeed impossible) to apply. Advanced Process Control (APC) is thus essential today in the intelligent field development. Small differences in process parameters can have large effects on profitability; get it right and profits continue to grow; get it wrong and there are major losses. Many applications of APC have pay back times well within a year. Considerable attention needs to be given to the operators to ensure that they can apply these new technologies effectively.

Who Should Attend?
This course is designed for professional reservoir engineers, production engineer, asset managers and senior managers.

What You Will Learn:
- Clear understanding of internal model control (IMC),
- Understanding of the concept of Model Predictive Control (MPC),
- Understanding of the use of Reference Models,
- Formulation of the control problem
- Understanding of the process of MPC steady state optimization,
- Application of real-time decision making system to support remote and on-site intelligent field development activities.

Course Outline
- Justification of Advanced Control
- Fundamentals of Process Control & Tuning PID Loops
- Internal Model Control (IMC)
- Model Predictive Control (MPC)
- Control Valve Theory
- Real-Time Decision-Making System
- Application of the Theory to Optimization and Control of Reservoir Management Using a Reservoir Simulator

1.27 APPLIED RESERVOIR ENGINEERING

Course Length: **5 Days**
Course Dates: **May 13 - 17, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
This 5-days course represents the core of our reservoir engineering program and the foundation for all future studies in this subject. Numerous engineering practices are covered ranging from fluid and rock properties to simulation and field development planning. Proficiency in using Microsoft Excel to perform calculations and make graphs is desirable. Reservoir engineering is also presented in the context of a modern, multi-disciplinary team effort using supporting computer technology. The participants will learn how to determine critical properties of reservoir rocks fluid (oil, water, and gas) PVT relationships, calculate hydrocarbons initially in place using several methods, assess reservoir performance with dynamic techniques, and determine the parameters that impact well/reservoir performance over time. The training will also expose the participants to how to analyze well tests using standard well testing principles and techniques, characterize aquifers, determine reservoir drive mechanisms for both oil and gas reservoirs, apply oil and gas field development planning principles, and forecast production decline.

Who may attend?
This course is designed for senior managers, project managers, reservoir engineers, geologists, and geophysicists.

What You Will Learn:
- Determine critical properties of reservoir rocks fluid (oil, water, and gas) PVT relationships
- Calculate hydrocarbons initially in place using several methods
- Assess reservoir performance with dynamic techniques
- Determine the parameters that impact well/reservoir performance over time
- Analyze well tests using standard well testing principles and techniques
- Characterize aquifers
- Determine reservoir drive mechanisms for both oil and gas reservoirs
- Apply oil and gas field development planning principles
- Forecast production decline

Course Outline
- Petroleum geology and formation evaluation
- Volumetric reserve estimates
- Rock and fluid properties
- Geostatistics
- Well performance, deliverability, and testing
- Pressure transient testing of oil and gas wells
- Productivity of horizontal wells
- Gas and water coning in vertical and horizontal wells
- Decline curve analysis
- Reservoir drive mechanisms and producing characteristics
- Material balance calculations
- History matching and uncertainty assessment

1.28 ADVANCED PETROLEUM ROCK MECHANICS

Course Length: **5 Days**
Course Dates: **September 9 - 13, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This course will introduce professionals to principles and applications of geo-mechanics in the exploration and production industry. The student will understand the drivers and rock responses to drilling, stimulation and production operations. Wellbore stability, hydraulic fracturing, compaction and water injection will be discussed, and general concepts will be introduced. Examples of solutions of available tools will be reviewed.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Understand principles and applications of geo-mechanics in the exploration and production industry
- Understand the drivers and rock responses to reservoir, drilling, completions, stimulation and production operations

Course Outline:
- Introduction to petroleum geomechanics and rock mechanical properties
- Linear and non-linear deformation and failure properties of rocks
- Geomechanics for integrated reservoir characterization problems (seismic, well log, production data)
- Geomechanics for 4D seismic history matching and uncertainty quantification (data integration and multi-objective optimization for 3D reservoir characterization and building reservoir models)
- Geomechanics for sand production problems (production induced changes in reservoir geomechanics)
- Geomechanics for subsidence and compaction problems
- Integration or coupling of geomechanics and multiphase reservoir flow (production induced changes in reservoir geomechanics under fluid flow)
- Geomechanics for casing stability problems
- Geomechanics for borehole stability and breakout problems (rock stability)
- Field case studies and hands-on practice

1.29 INTELLIGENT OILFIELD TECHNOLOGIES IN DRILLING AND PRODUCTION OPERATIONS

Course Length: 5 Days
Course Dates: October 21 - 25, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course provides a comprehensive overview of intelligent oilfield solutions in closed-loop drilling and production operations. The benefits and various applications of the intelligent oilfield solutions in closed-loop drilling and production operations will be discussed. The course will also cover multiple hands-on field examples.

Who Should Attend?
This course is designed for professional petroleum engineers, reservoir engineers, production engineers, operation engineers, drilling engineers and asset managers

What You Will Learn:
- How to place optimal weight on bit (WOB) when drilling through a rock formation to reach a hydrocarbon reservoir
- How to apply a model predictive control strategy in drilling operations
- The effects of uncertainty in drilling process optimization
- Knowledge of reservoir phenomena, and efficient data management
- Knowledge of real-time production optimization (RTPO) in oil and gas processes
- Knowledge of integrating asset-wide operations at multiple time scales

Course Outline:
- Overview of intelligent oilfield technologies
- Overview of well drilling process
- Automated well drilling system
- Well drilling modeling framework
- Theory of closed-loop control
- Application of closed-loop control in well drilling process
- Reservoir modeling for large-scale production performance monitoring
- Short-term parametric modeling for large-scale production performance monitoring
- History matching formulations and techniques
- Uncertainties quantification in reservoir performance simulation
- Production forecasting
- Production optimization
- Production allocation
- Real-time production optimization workflow
- Class exercises

1.30 Optimal Parameter Updating In Seismic History Matching

Course Length: 5 Days
Course Dates: November 4 - 8, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course highlights history matching problem formulation, deterministic and probabilistic history matching techniques, as well as common techniques for regularization and parameterization. The course also presents a 4D seismic history matching workflow based on streamline simulation, parameterization via pilot points and Kriging and geo-body updating, a petro-elastic model and the neighborhood algorithm, all in an automatic framework. The automatic framework is used for updating parameters such as permeability, barrier transmissibilities and NTG (Net to Gross) by matching 4D seismic predictions from the simulations to observed data. Applications and case studies of the 4D seismic history matching methods in reservoir management decisions and planning of future production strategies will be presented and discussed.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Understand foundations of modern history matching process
- Seismic history matching using time-lapse seismic data
- Apply automatic seismic and production history matching workflow
- How to identify uncertainty associated with seismic history matching techniques
- How to quantify uncertainty associated with seismic history matching techniques
- How to use automatic framework for updating parameters such as permeability, barrier transmissibilities and NTG (Net to Gross)
- Improved reservoir description via seismic history matching

Course Outline:
- Reservoir modeling for field development planning
- Fundamentals of manual and automatic history matching
- Various elements for automatic history matching workflow
    - Generation of multiple models
    - Simulation flow
    - Petro-elastic model
    - Comparison of simulated data with historical data
    - Optimization algorithms
- Pilot points and Kriging
- 4D seismic data and observed production data
- Objective function
- 4D seismic history matching workflow and case studies

1.31 PETROLEUM ROCK MECHANICS & APPLIED RESERVOIR CHARACTERIZATION

Course Length: 5 Days
Course Dates: September 23 - 27, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This training course presents workflow that makes use available geo-mechanical and geophysical data for reservoir characterization. The methodology incorporates soft computing tools as well as geo-statistical simulation techniques to improve the property estimates as well as overall characterization efficacy. The course also includes extensive hands-on training and problem solving using public domain software.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Integrated characterization framework for petroleum reservoirs with adaptable workflows for all stages of data processing, interpretation and analysis
- A novel auto-picking workflow for noisy passive seismic data used for improved accuracy in event picking as well as for improved velocity model building
- Improved seismic survey design optimization framework for better data collection and improved property estimation.
- Property mapping from well logs and seismic data including stress and anisotropic weakness estimates for integrated reservoir characterization and analysis
- Integration of results (seismic and well logs) from analysis of individual data sets for integrated interpretation using predefined integration framework and soft computing tools
- Uncertainty quantification and analysis to better quantify property estimates over and above the qualitative interpretations made and to validate observations independently with quantified uncertainties to prevent erroneous interpretations

Course Outline:
- Introduction to petroleum geo-mechanics. Rock mechanical properties
- Concept of stress and strain. Stress-strain relationships. General Hooke's law.
- Transversally –isotropic medium. Thomsen parameters. Young modules and Poisson's ratios
- Static and dynamic coefficients. Brittleness index. Theoretical description of overall rock mechanical properties. Rock physics modeling. Rocks and Waves. Elastic Rock Properties
- Waves-Based Forward and Inverse Problem. Waves in Isotropic and Anisotropic Unbounded Media. Reflection –Refraction. Isotropy-anisotropy
- Forward and inverse modeling of reservoir structure. Manual and automatic history matching
    - Various elements for automatic history matching workflow: Generation of multiple models, Simulation flow, Petro-elastic model, Optimization algorithms
- 4D seismic history matching workflow and case studies

1.32 RESERVOIR CHARACTERIZATION USING TIME-LAPSE SEISMIC AND PRODUCTION DATA

Course Length: 5 Days
Course Dates: July 8 - 12, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Reservoir modeling is the practice of generating numerical representations of reservoir conditions and properties on the basis of geological, geophysical and engineering data measured at a limited number of borehole locations. Building an accurate reservoir model is a fundamental step of reservoir characterization fluid flow performance forecasting and has direct impact on reservoir management strategies, risk/uncertainties analyses and key business decisions. Seismic data (due to its high spatial resolution), plays a key role not only in defining the reservoir structure and geometry, but also in constraining the reservoir property variations. This course presents innovative solutions and methods to incorporate seismic and production data in reservoir characterization and model building processes to improve consistency of reservoir models with geological and geophysical measurements. The course also addresses issues related to (mis)match of the initial reservoir model with well logs and 3D seismic data. These issues include the incorporation of various seismic constraints in reservoir property modeling, the sensitivity of the results to realistic noise in seismic data, geo-statistical modeling parameters and the uncertainties associated with quantitative integration of seismic data in reservoir property modeling. Case studies will be discussed to illustrate the field application of the concepts in the course.

Who Should Attend?
This course is designed for reservoir engineers, petrophysicists, geoscientists and asset managers

What You Will Learn:
- Integration of 3D and time-lapse seismic data into reservoir modeling and history matching processes
- Estimation of subsurface geo-models using multi-objective (stochastic) optimization methods and direct/indirect measurements to simultaneously constraint model
- Novel methods to generate reservoir models that optimally match geological and geophysical data to improve the processes of reservoir characterization and fluid flow performance forecasting

Course Outline:
- Introduction to integrated reservoir studies. Rock physics analysis. Reservoir modeling and data integration. Reservoir modeling and joint inversion. Simultaneous optimization of multiple objective functions for reservoir modeling. Seismic constrained static reservoir modeling. Seismic and production data incorporation into reservoir models. Uncertainty analysis
- Workflows for statistical integration of 3D seismic/4D time-lapse seismic & production data
- Estimation of subsurface geo-models by multi-objective optimization methods. Probabilistic reservoir property modeling jointly constrained by 3D seismic data, well logs and production data. Challenges in 4D seismic data incorporation into dynamic reservoir models
- Field case studies and hands-on practice

1.33 ADVANCED DATA ASSIMILATION METHODS IN HISTORY MATCHING AND UNCERTAINTY QUANTIFICATION: THEORY AND PRACTICE

Course Length: 5 Days
Course Dates: June 3 - 7, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of deterministic and stochastic inverse modeling and their application to calibration of hydrocarbon reservoirs and uncertainty quantification. It covers a variety of topics related to the integration of production and performance data into reservoir models and account for their respective errors and uncertainties. The topics include history matching problem formulation, deterministic non-linear least-squares methods, probabilistic Bayesian methods, iterative and recursive history matching techniques, gradient-based techniques and adjoint method, as well as common techniques for regularization and parameterization of reservoir models for history matching. Applications and case studies from both deterministic and probabilistic history matching will be presented and discussed.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists and asset managers

What You Will Learn:
- Understand foundations of modern history matching techniques
- Understand foundations of uncertainty management in history matching techniques
- Communicate and implement a consistent uncertainty management policy
- Understand the value of uncertainty management analysis in reservoir development and management
- Develop clear guidelines for making decisions in analysis in reservoir development and management

Course Outline:
- History Matching Problem Formulation
- Linear Inverse Problems
- Regularized Least Squares Inverse Problems
- Nonlinear History Matching Inverse Problems
- Preliminary Material on Stochastic Approaches
- Bayesian History Matching and Stochastic History Matching with the Ensemble Kalman Filter
- Reservoir Parameterization for History Matching
- Case Studies
- Case Study 1: Gradient-Based History Matching
- Case Study 2: Ensemble Kalman Filter for History Matching

1.34 WELL INFLOW PERFORMANCE – DESIGN & ANALYSIS

Course Length: **5 Days**
Course Dates: **July 22 - 26, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
The purpose of this 5-day course is to instruct reservoir, production and completion engineers in well performance design and analysis techniques. This course represents a change from traditional Well Flow Analysis or Nodal Analysis courses, concentrating on the well inflow portion of the well/reservoir system. The course will be taught at an advanced level. Participants will therefore be assumed to have a basic understanding of well flow analysis concepts and techniques.

Who may attend?
This course is designed for senior managers, asset managers, reservoir engineers, and production engineers.

What You Will Learn:
- Inflow performance concepts and techniques to develop inflow predictions for both simple and complex completions
- Detailed review of Darcy and Non-Darcy skin effects for alternative well completion designs
- How to determine optimal work-over candidates as well as the most effective completion alternatives for a given well
- Methods for post-auditing well completion performance to achieve continuous improvement objectives
- Techniques for evaluating the costs and benefits of alternative completion designs
- Review of Laboratory Studies used to assess formation damage, drill-in fluid design and sand control design

Course Outline
- Introduction to Well Inflow Performance Analysis
- Methods for Predicting Inflow Performance
- Primary Components of the Skin Effect and Skin Related Pressure Loss
- Integration of Inflow Performance Analysis into Completion Design
- Continuous Improvement from Performance Analysis/Completion Post-Auditing
- Hydraulically Fractured Wells, Horizontal and Multi-layers Wells
- Cost/Benefit Analysis
- Laboratory Damage Testing/Laboratory Fluid Testing/Problem Solving

1.35 FUNDAMENTALS OF PETROLEUM EXPLORATION, DRILLING AND PRODUCTION FOR NON-TECHNICAL PERSONNEL

Course Length: 5 Days
Course Dates: June 24 - 28, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of petroleum exploration, drilling and production design and operations. Field case studies will be provided to illustrate the field application of the concepts, methods, processes and practices

Who Should Attend?
This course is designed for project engineers, geoscientists, reservoir engineers, production engineers, petroleum engineers, planning and development analysts, business planner, senior/ executive managers

What You Will Gain:
- Tools for Exploration, Field Appraisal and Development
- Field Development Planning Processes. Decision Modeling for Petroleum Production Improvement Opportunity
- Reservoir Engineering and Management Processes
- Drilling and Production Workflows
- Cost Estimations. Risk Analysis and Decision Makings

Course Outline:
- Overview of the Petroleum Industry. Energy Sources; Nature of Oil and Gas
- Contracts and Regulations for Petroleum Exploration and Production
- Petroleum Leasing and Agreements (Joint Ventures, Production Sharing Agreements, etc)
- The Earth's Crust and Geological Time. Sedimentary Rocks Distributions, Ocean Environment and Maps. Source Rocks Definition; Petroleum Generation, Migration, Traps and Accumulation
- Petroleum Geology and Reservoir Types. Field Development Planning Processes
- Drilling Systems Design & Operations. Formation Evaluation Methods. Well Logging Techniques
- Subsurface Fluid Flow and Reservoir Performance. Reservoir Reserves and Hydrocarbon Recovery. Well Completions Systems Design & Operations
- Well Testing and Formation Damage Identification
- Production Performance Monitoring and Well Management
- Field Case Studies

1.36 RISK MANAGEMENT IN PETROLEUM EXPLORATION & PRODUCTION PROJECTS

Course Length: 5 Days
Course Dates: November 18 - 22, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course highlights modern concepts risk management techniques in petroleum exploration and production (E & P) projects' life cycle. Multiple case studies are presented to demonstrate risk management and mitigation processes in the upstream petroleum industry.

Who Should Attend?
This course is designed for reservoir engineers, geologists, geophysicists, project managers and senior managers

What You Will Learn:
- Understand foundations of modern petroleum risk management techniques and processes
- How to systematically assess relevant risks and uncertainties in petroleum E & P projects
- Learn to think more probabilistically and promote the use of rigorous risk analysis
- Measure the value of seeking additional information
- Communicate and implement a consistent risk and uncertainty management policy
- Understand the value of portfolio analysis and optimization in E & P projects
- Develop clear guidelines for making decisions E & P projects
- Better evaluate the firm's position relative to a strategic plan

Course Outline:
- Phases of Oil and Gas Projects
- Project Valuation and Selection Methods
- Introduction to the Concept of Risk and Uncertainty
- Overview of Risk Management in Petroleum E & P Projects
- Value of Information (VOI) in E & P Projects
- Concept of Risk Management in E & P Projects
- Advanced Risk Analysis and their Applications in E & P Projects
- Fundamental Concepts in Probabilistic Modeling for Risk Assessment
- Geo-statistics for Stochastic Reservoir Characterization
- Monte Carlo Simulation and Its Interpretation
- Probabilistic Reservoir Modeling for Uncertainty & Risk
- Modeling Risk Optimization in E & P Projects
- Risk Optimization Techniques
- Integrating Uncertainty and Risk Management in E & P Projects
- Incorporating Risk in E & P Project Optimization
- Integrated Uncertainty and Risk Management Workflow
- Case Studies

1.37 ENHANCED OIL RECOVERY PROCESSES

Course Length: 5 Days
Course Dates: June 10 - 14, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description
Enhanced oil recovery processes target the incremental oil that can be economically recovered from a hydrocarbon reservoir over and beyond what can be economically produced by primary and secondary methods. Enhanced oil recovery (EOR) encompasses all process of improving oil recovery by injecting fluids/materials that is originally not present in the reservoir. This broad definition embraces all EOR processes but exclude pressure maintenance processes such as waterflooding. EOR processes may be implemented during any phase (primary, secondary and tertiary) of the producing life of the reservoir. Primary recovery relies on natural drive mechanisms, while secondary recovery, such as gas and water injection focus on pressure maintenance. This course will discuss the broad classification of EOR processes and their applications. This course will also introduce the basics concept of flow as it relates to EOR processes and mobilization of residual oil. Finally, we will discuss the theory and practice of EOR processes such as gas injection, chemical processes and thermal methods.

Who Should Attend?
This course is designed for professional reservoir engineers, petrophysicists, geophysicists, geologists, asset managers and senior managers interested in EOR projects.

What You Will Learn:
- Choose appropriate methods (with their target applications, benefits, and limitations) for improving oil recovery from reservoirs under primary depletion or pressure maintenance utilizing water or immiscible gas injection
- Enhance oil recovery beyond waterflooding or immiscible gas injection project
- Understand mechanisms responsible for recovery improvement in various EOR methods
- Use chemical methods: injection of chemicals (polymers, surfactants, caustic soda, etc.) in the reservoir
- Select EOR methods using screening criteria
- Use designing procedures - theoretical, laboratory tests, and field pilots
- Plan and implement EOR processes employing the proper empirical, analytical, and simulation tools
- Forecast rate-time and recovery-time behavior under various EOR methods and analyze reservoir performance
- Assess risks and ways to minimize their impact on project economics Monitor reservoir/well behavior

Course Outline
- Introduction to EOR methods
- Screening criteria and technical constraints
- Displacement fundamentals
- Miscible flooding: Fundamentals and applications, and miscible simulator
- Polymer flooding: Applications, rheology of polymer solutions, and polymer adsorption and retention
- Micellar-polymer or microemulsion flooding
- Thermal processes
- Simulation models as reservoir management tools
- EOR performance evaluation: Field cases and exercises

2. MANAGEMENT AND LEADERSHIP COURSES

2.1 STRATEGIC LEADER: STRATEGIC PLANNING, LEADERSHIP AND CONFLICT MANAGEMENT

Course Length: **5 Days**
Course Dates: **May 6 - 10, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
This course opens participants to new perspectives on strategic implementation with a complete understanding of all aspects of implementation process. It will enhance participants on how to make informed decisions effectively and efficiently. Participants will understand how to thoroughly infuse corporate structure with corporate strategies and how to integrate strategy formulation and implementation. In addition, participants will learn how to use conflict management as a competitive strategy.

Who Should Attend?
Operating managers, project managers, technology managers, department managers, or anyone in the company with a leadership role.

Course Outline
UNDERSTANDING THE STRATEGIC ENVIRONMENT
- Organizational Strategy
- Strategy management concept, strategy vs. business
- The Five Tasks of strategic management
- Missions vs. strategic visions
- Crafting a Strategy

STRATEGIC IMPLEMENTATION: EVALUATING THE STRATEGIC ENVIRONMENT
- Evaluating Resources & Competitiveness
- Strategic assessment & competitiveness
- Strategic group mapping
- Identifying resource strengths/deficiencies, competitive capabilities, core competencies, distinctive competencies, and strategic cost analysis
- The Keys to Strategic Execution
- Overcoming key organizational hurdles (cognitive, resource, motivational, political)
- Twelve strategies for instilling a culture of execution in an organization

INTEGRATION, INCENTIVES & CHANGE MANAGEMENT
- Managing integration, horizontal integration, full and taper integration, vertical integration, and alternative integration options
- Organizational Incentives
- Change Management

CONFLICT MANAGEMENT
- Theory, processes, and practice of negotiation
- Ethical Considerations
- Increasing quality of negotiated agreements
- Preparation & effective communication & Managing Conflict to increase power

2.2 RISK ASSESSMENT AND RISK MANAGEMENT IN OIL & GAS INDUSTRY

Course Length: **5 Days**
Course Dates: **May 20 - 24, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
Risks are complex and interconnected with supply chains, customer and shareholder expectations, evolving technology and regulatory compliance needs. This makes risk management planning, implementation and communication increasingly necessary skills for all organisations.

Who Should Attend?
This course is designed for professional engineers, asset managers, all members of emergency management team, emergency service personnel, etc.

Course Outline
- Introduction to Upstream Decision
- Value Chain Analysis of the Upstream Petroleum Industry; Phases of Oil & Gas Field Developments; Project Valuation & Selection Methods
- Diversification in E & P; Sensitivity & Probability Analysis; Modeling Risk Propensity
- Introduction to Risk Assessment & Management Concepts; Structuring Decisions
- Risk versus Uncertainty; Probability Concepts and Assessment
- Modeling for Decision Analysis & Options
- Managerial Perspective on Risk in Projects and Portfolios
- Risk Assessment Techniques & Processes - Mapping
- Integrating E & P Business Strategy, Risk Management & Capital Allocation
- Operational Risks in Different Segments of Upstream Petroleum Industry
- Risk Management Workflow for Upstream E & P Projects
- Exercise #1: Applying Decision & Risk Analysis in an Hypothetical O & G Project - Framing
- Exercise #2: Applying Decision & Risk Analysis in an Hypothetical O & G Project - Modeling
- Exercise #3: Building Spreadsheet-Based Decision Models
- Probability and Statistics for Uncertainty Quantification
- Geostatistics for Stochastic Reservoir Characterization
- Dealing with Multiple Uncertainties
- Monte Carlo Simulation and Its Interpretation
- Uncertainty Analysis with Software Tools
- Exercise #4: Making decisions based on Monte Carlo Simulation
- Exercise #5: Modeling the Efficient Frontier
- Incorporating Risk & Uncertainty in Project Evaluations for Upstream Petroleum Industry
- Risk-Sharing and Business Model Analysis (Joint Venture Examples)
- Risk Optimization Techniques: Integrating Uncertainty in E & P Projects
- Value of Information
- Maximizing Return and Minimizing Risk
- Exercise #7: Upstream E & P Projects under Uncertainty

2.3 MAKING STRATEGY WORK WITHIN A GLOBAL MARKET DYNAMICS

Course Length: **5 Days**
Course Dates: **June 24 – 28, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
Making Strategy Work within a Global Market Dynamics opens participants to new perspectives on strategic implementation with a complete understanding of all aspects of implementation process. It will enhance participants on how to make informed decisions effectively and efficiently. Participants will understand how to thoroughly infuse corporate structure with corporate strategies and how to integrate strategy formulation and implementation.

Who Should Attend?
Operating managers, project managers, technology managers, department managers, or anyone in the company with a leadership role.

What You Will Learn
The Course will be divided into three key sections:
SECTION I: Understanding the Strategic Environment (Modules 1-3)
SECTION II: Strategic Implementation: Evaluating the Strategic Environment (Modules 4-6)
SECTION III Integration, Incentives & Change Management (Modules 7-9)

Course Outline
Module 1: Organizational Strategy
- Strategy Management Concept
- Strategy vs. Business Model
- Five Tasks of Strategic Management
- Missions vs. Strategic Visions

Module 2: Crafting a Strategy
- Crafting a Strategy
- Developing a Strategic Vision
- Components of a Company's Strategy

Module 3: Evaluating Resources & Competitiveness
- Strategic Assessment & Competitiveness
- Strategic Group Mapping
- Identifying Resource Strengths and Competitive Capabilities
- Identifying Resource Weaknesses and Competitive Deficiencies
- Core Competencies vs. Distinctive Competencies
- Strategic Cost Analysis

Module 4: Tailoring Strategy to Fit Specific Industry & Company Situations

- Objectives of Benchmarking
- Features of an Emerging Industry
- Features of High Velocity Markets
- Characteristics of Industry Maturity

Module 5: Strategies for Sustained Rapid Growth

- Strategies for Sustaining Rapid Growth
- Strategies based on a Company's Market Position
- Ten (10) Commandments for Crafting Successful Business Strategies

Module 6: The Keys to Strategic Execution

- Overcoming Key Organizational Hurdles (Cognitive, Resource, Motivational, Political)
- Focus on a Successful Execution
- Twelve Strategies for Instilling a Culture of Execution in an Organization

Module 7: Managing Integration

- Managing Integration
- Horizontal Integration
- Full and Taper Integration
- Vertical Integration
- Alternative Integration Options

Module 8: Organizational Incentives

- Organizational Incentives
- What Determines Employee Behavior
- Incentive Tools Available to Managers
- The Six Keys to Organizational Performance
- Getting Managers to be Better Managers
- Internal/Managerial Strategies
- Strategies for Changing Incentives

Module 9: Change Management

- What is Organization Change Management?
- Factors in Organizational Change
- Resistance to Change
- Commitment vs. Compliance
- Summary

2.4 LEAN MANAGEMENT AND BUSINESS SUSTAINABILITY IN COMPETITIVE EDGE

Course Length: **5 Days**
Course Dates: **June 10 - 14, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
As the energy industry continues to experience economic slowdown, it becomes increasingly more important to look at operating priorities and principles within practices of lean management and business sustainability for a competitive edge. When adjustments are made in the organization's financial model and re-organizations begin shifting resources, ensuring you are focused on finding the right balance between 'what is necessary' and 'what is an opportunity' don't hinder your decision making or affect your overall business goals and achievements. This course will allow the opportunity to explore such important principles and practices in lean management and business sustainability through interactive dialogues and group engagement activities. We will look at defining lean management and continuous improvement models and tools while layering in important aspects of business sustainability that enhance your business goals and objectives. We will also look at the importance of life cycle analysis. And, while keeping in mind that lean and sustainable businesses have been shown to attract and retain employees more readily and experience less financial and reputation risk, how this can keep innovation soaring while providing the capability of adapting to new environments.

Who Should Attend?
Operating managers, project managers, technology managers, department managers, or anyone in the company with a leadership role.

What You Will Learn
The key objectives include:
- Developing an understanding of the importance of exercising lean management principles and layering in business sustainability practices
- Exploring tools and models that are useful and can help you build more lean management and sustainability practices into your department or organization
- Examining impacts from lean management decisions – finding balance between cost reductions and organizational capabilities to achieve your overall business goals
- Examining impacts from sustainable business decisions – finding the right balance and opportunities through evaluation of economic efficiency, social equity and environmental accountability
- Building a cohesive bridge between lean management practices and business sustainability principles to enhance
- What is Lean Management & Why is Lean Management important to Energy Industry?
- Intersection of Lean Management and Continuous Improvement

Course Outline
- What is Lean Management & Why is Lean Management important to Energy Industry?
- Intersection of Lean Management and Continuous Improvement
- Lean Management and Introduction of Sustainable Businesses
- Tools, techniques and models for your portfolio for lean management principles

- What is Sustainable Business Practices & Why is this important to the Energy Industry?
- Healthy Economic, Social and Environmental systems create sustainability
- Sustainable Business Practices
- How do we minimize our impact at the global or local level?
- Exploring the key features of sustainable businesses
- Case Studies
- Identifying resources such as the World Council for Economic Development (WCED)
- Exploring and evaluating your economic efficiencies, social equity and environmental accountabilities
- Interactive session using case studies to review key capabilities and its application to our business practices
- The Competitive Edge
- Bridging Lean Management and Business Sustainability practices for increasing (or maintaining) your competitive edge
- Layering effect of Lean Management, Business Sustainability and Your Competitive Edge

2.5 LEADERSHIP & MANAGEMENT SKILLS FOR TOP PERFORMERS

Course Length: **5 Days**
Course Dates: **July 8 - 12, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
This course is designed for managers, directors and executive management of corporations that want to learn how to become and how to develop top performing leaders within the organization, making your organization a cradle for exceptional performance.

Who Should Attend?
Operating managers, project managers, technology managers, department managers, or anyone in the company with a leadership role.

Course Outline
Leadership & Management Skills for Top Performers
• Understanding and accelerating Executive Leadership Expectations
• Examining your Executive Leadership Challenges
• Exploring the Fundamental Concepts of Executive Leadership
• The Four Factor Model of effective Executive Leadership
• Differentiating Between Leadership and Management
• Identifying the Executive Leadership Requirements for the 21st Century

Leadership with the Head Exploring the Strategic Elements of Executive Leadership
• Defining Mission, Vision and Values
• Focusing on the Big Picture when building the Culture
• The Importance of Planning and Prioritizing in Day to Day Activities
• Taking the Time to Focus on Envisioning the Future
• How a Personal Vision Statement helps you Achieve your Organizational Vision

Leadership with the Hands, Understanding and Appreciating Situational Leadership II, The Art of Influencing Others
• How to Develop People, Value Differences and Encourage Honest Communication
• Developing your Leadership Style to gain Commitment from yours Employees
• Matching your Leadership Style to your Employees Developmental needs

Leadership with the Feet: Personal Values and Ethics at Work
• Understanding the Challenges you Face and the Various ways you can manage them
• Creating a culture of Trusting Relationship
• How individualized "passionate purpose" provides a context for consistency and credibility

Leadership With the Heart: Practicing Way to Communicate
• Executive Leadership Techniques for Enhancing Pride in the Work and the Organization
• Motivating the Workforce Three Elements That Ensure Increased Job Satisfaction and Productivity
• Examining the Role of Emotional Intelligence in Successful Executive Leadership Development

2.6 PETROLEUM ECONOMIC EVALUATION & PROJECT INVESTMENT DECISION MAKING

Course Length: 5 Days
Course Dates: July 1 - 5, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of economics and engineering related to petroleum reservoirs. This course will review the concepts of petroleum reserves, the time value of money and their applications for evaluating investment situations. These techniques can be used to systematically qualify the relative economic merits of investment opportunities. A number of analytical, empirical and numerical methods for estimating volumetric performances of petroleum reservoirs under uncertainties will be discussed. Field case studies will be provided to illustrate the field application of the petroleum economic evaluations and project investment decision making concepts, methods, processes and practices

Who Should Attend?
This course is designed for project engineers, geoscientists, reservoir engineers, production engineers, petroleum engineers, planning and development analysts, business planner, senior/ executive managers

What You Will Gain:
- Knowledge of tools and processes for evaluating projects and prioritizing investments decisions
- How to help a project developer evaluate the economic impact of his project, which accelerate ability to procure financing for the project
- How to help several investment groups determine economics of new asset and value of existing assets. This helps to evaluate projects and execute projects faster
- Understand field planning optimization. Understand risks and rewards to make better decisions on key projects pertaining to portfolios and resources
- Preparation of project expenditure proposals that can win management approval

Course Outline:
- Overview of petroleum reserves definition and classifications.
- Reservoir performance forecasting methods - decline curve analysis and material balance approach - deterministic and probabilistic methods
- Concepts of economic evaluation. Risk and Uncertainties in Economic Evaluation. Economic indicators and profitability. Risk analysis. PSC analysis and fiscal system
- Basics of decision analysis. Different classes of decision problems. Investment proposal ranking methods. Investment decisions
- Decision under uncertainty. Decision under risk. Multiple-objective problems
- Field Case Studies

2.7 COST ESTIMATION AND MANAGEMENT FOR EXPLORATION & PRODUCTION PROJECTS

Course Length: 5 Days
Course Dates: July 15 - 19, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course covers the fundamental principles of cost estimation and uncertainty management techniques. Field case studies will be provided to illustrate the field application of the cost estimation and management fundamentals, methods, processes and practices.

Who Should Attend?
This course is designed for project engineers, design engineers, consulting engineers, petroleum engineers, facility engineers and senior managers

What You Will Gain:
- Understand the financial workings of your company
- Read and explain simple financial statements
- Understand economic evaluation techniques in project proposals
- Calculate the financial viability of expenditure proposals
- Optimize the use of scarce capital on your projects
- Prepare project expenditure proposals that can win management approval
- Make effective decisions under capital rationing situations
- Communicate effectively with your financial managers
- Effectively execute sensitivity studies taking into account risk and uncertainty

Course Outline:
- Introduction to Cost Estimation and Management Concepts
- Accounting Basics and Financial Statements
- Ratio Analysis
- Investment Decisions and Profitability
- Economic Factors
- Cost Accounting
- Cash Flow Concept
- Time Value of Money
- Investment Proposal Ranking Methods
- Capital Management
- Inflation
- Risk and Uncertainties in Economic Evaluation
- Field Case Studies

2.8 PROJECT MANAGEMENT PROFESSIONAL (PMP®) CERTIFICATION EXAM PREP

Course Length: 5 Days
Course Dates: July 8 - 12, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This short course is a unique blend of cutting-edge techniques and practical tools for managing projects, portfolios and complex systems. It offers the highest quality education and certification training course specifically designed to meet the needs of project managers willing to pass the PMI Project Management Professional (PMP®) certification examination on time and on budget. Case studies and online PMP® certification tests will be provided to illustrate the field application of the PMI standard norms, fundamentals, methods, processes and practices. This course is aligned with A Guide to the Project Management Body of Knowledge (PMBOK®) – fifth edition, which provides industry standard tools approved by the Project Management Institute (PMI®).

Who Should Attend?
This course is designed for project engineers, design engineers, consulting engineers, facility engineers and senior managers

What You Will Gain:
- Expert instruction from PMP® certified instructors
- Practical know-how from practising experts with demonstrated capital project delivery ability
- Advanced skills and knowledge in project management
- Knowledge and skills to be actively involved in planning, implementation and evaluation stages of a range of road safety projects
- Ability to make independent judgements and high level decisions in a variety of technical or managerial contexts
- Realistic exam preparation software with over 1200+updated practice questions
- Customized training program assessed by PMI®, and fully accredited 35 contact hours

Course Outline:
- Project management concepts
- Project management process groups
- Project management fundamentals 101 (project integration, scope, time and cost management)
- Project management fundamentals 102 (project quality, risk and procurement management)
- Project management fundamentals 103 (project stakeholder, communication and human resources management)
- Project economics and finance
- Leadership and change management
- Project delivery systems
- Professional development and ethics

2.9 COST ESTIMATION & ECONOMIC ANALYSIS FOR CONCEPT SELECTION AND OPTIMIZATION

Course Length: 5 Days
Course Dates: November 11 - 15, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

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

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

What You Will Learn
- Importance of cost estimation & economic analysis in continuous improvement programs
- The difference between price and cost analysis
- Methods of price analysis and how to manage volatile markets
- Methods of cost analysis
- Development of "Should Cost"
- Types of TCO models

Course Outline
- Use of price indexes, Cost estimation & economic analysis
- Total cost of ownership & its Models
- RFQ/tendering as a price analysis tool
- Cost estimating relationships
- Purchasing savings impact on the bottom line
- Developing the spend profile
- Sources of spend data & How to perform the ABC analysis
- Continuous improvement skill sets
- Selection tool, Methods of price analysis, & Historical analysis
- Developing company purchase price
- Index methods of cost analysis & Major elements of cost
- Requesting supplier cost info & Sources of cost information
- What and how important are supplier overheads
- How much profit should the supplier make economic

2.10 ESSENTIAL STRATEGIC LEADERSHIP AND MANAGEMENT SKILLS FOR HIGH IMPACT LEADERS

Course Length: **5 Days**
Course Dates: **July 8 – 12, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
The most successful managers across every business function are inspiring leaders, smart strategists and creative thinkers who make innovation a habit and continue to build breakthroughs-strategies that re-shape markets, deliver greater value at a lower cost, re-define channels and force incumbents to scramble. More than ever before, creativity is central to solving complex problems. Therefore, emerging leaders must quickly learn and deploy core management skills, develop a broad strategic perspective, take their leadership skills to the next level, and expand their professional and personal networks.

This training course analyzes the symbiotic relationship between leadership and decision making. It also highlights strategic leadership and management theories and practices that encompass relentless planning, organizing, monitoring, analysis and appraisal of what a business needs to meet its set goals. Through real-world examples, you will learn how to develop winning strategies and strengthen your organization's capacity to drive innovation. Individual and group exercises will provide hands-on opportunities to apply new approaches to your organization's unique strategy challenges.

Who Should Attend?
This training course is appropriate for decision makers from any industry who want to improve their organization's capacity to formulate and implement innovative strategies. It is also designed for executives and/or managers in a wide range of disciplines who are looking to rapidly increase their leadership and management skills and strategic perspective in order to be more effective in their organization

What You Will Learn:
- Developing a solid understanding of the six core business areas every manager should know: leadership; strategy; communication; finance; marketing; culture and innovation
- Identifying organization's strategic gaps
- Building innovation into the strategy development process
- Creating more value and secure a competitive advantage
- Designing innovative, go-to-market strategies and framework that foster creativity, fuel growth and improve organizational performance
- Solving complex challenges through the process of structured design thinking
- Identifying and exploiting markets that are uncontested new
- Applying creative strategies to market organization's business offering

Course Outline:
- Understanding today's executive leadership expectations
- Investment program planning, execution and governance
- Mastering six core business areas every manager needs to know
- Strategic thinking, planning and decisions
- Overview of strategic leadership and management principles
- Overview of strategic leadership and management challenges and learnings

- Building strategic leadership and management process and plan
- Executing strategic leadership and management process and plan
- Apply strategic leadership and management skills necessary for creating a learning organization
- Generating, testing, and enhancing new ideas, strategies, and techniques
- Improving decision-making skills by boosting visual and innovative thinking
- Implementing innovative thinking processes and tools to drive innovation
- Implementing a methodology that overcomes barriers to innovative thinking
- Applying innovative thinking methodology to your specific challenges
- Testing, refining, and improving new ideas, business models, and processes
- Exploring the habits of today's new innovators and bringing diverse talent together to spark new ideas
- Fostering innovative strategies, eliminating obstacles, and managing risk
- Ensuring that innovation remains a strategic priority and driving innovation across the organization
- Hiring and partnering for successful innovation
- Measuring success in achieving innovation goals
- Group examples
- Case Studies
- Reflection & Overall Summary

3. COST ENGINEERING AND ESTIMATION COURSES

3.1 CERTIFIED COST PROFESSIONAL (AACE INTERNATIONAL CCP®) CERTIFICATION EXAM PREP

Course Length: **5 Days**
Course Dates: **June 17 – 21, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This short course is a unique blend of cutting-edge techniques and practical tools for project cost estimating, engineering and management. It offers the highest quality education and certification training course specifically designed to meet the needs of cost controller, project engineer, cost estimator, functional discipline lead and project managers willing to pass the AACE International Certified Cost Professional (CCP®) certification examination on time and on budget. Case studies and online CCP® certification tests will be provided to illustrate the field application of the AACE International standard norms, fundamentals, methods, processes and practices. This course is aligned with CCP Technical Paper Handbook AACE's Skills & Knowledge of Cost Engineering (6th Edition), AACE's Total Cost Management Framework, AACE's CCP Certification Study Guide, AACE's Recommended Practices 11R-88 and 10S-90, which provide industry standard tools approved by the Association for the Advancement of Cost Engineering (AACE International®).

Who Should Attend?
This course is designed for project engineers, design engineers, consulting engineers, petroleum engineers, facility engineers, senior managers, cost controllers and cost estimators

What You Will Gain:
- Expert instruction from AACE International CCP® certified instructors
- Practical know-how from practising experts with demonstrated capital cost estimating delivery ability. Advanced skills and knowledge in capital cost engineering and management
- Knowledge and skills to be actively involved in planning, implementation and evaluation stages of a range of petroleum E & P projects
- Ability to make independent judgements and high level decisions in a variety of technical or managerial contexts. Realistic exam preparation software with over 1200+updated practice questions. Customized training program assessed by AACE International CCP®

Course Outline:
- The Role of Cost Engineer. Cost Estimating Methodologies and Classifications
- An Introduction to Statistics, Economics and Finance
- Cost Engineering Concepts within Project Management. Planning Cost Control and Progress Measurement. Cost, Quality, Value and Contract Management. Risk Management and Common Cost Engineering Practices
- Comprehensive Cost Engineering Skills and Knowledge Use Cases. Case Studies on Cost Engineering Delivery Systems. Preparation for Writing A Technical Paper
- Professional Development and Ethics. CCP® Specific Examination Topics and Tests

3.2 TOTAL COST MANAGEMENT

Course Length: **5 Days**
Course Dates: **June 10 - 14, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description:
This training course provides fundamentals and advances as related to total Cost Management and an understanding of the latest theories and practice in the financial management of petroleum capital projects. It covers the identification and evaluation of capital investment options and development of capital project scope. It also provides a comprehensive introduction to AACE International's Total Cost Management framework as applied to portfolio, program and project management. Field case studies will be provided to illustrate the field application of the total cost management fundamentals, methods, processes and practices

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, buyers, project accountants, project risk managers, accountants, financial analysts, procurement managers, business development managers

What You Will Gain:
- Cost management fundamentals and workflows
- Evaluate capital project investment options
- Investment risk analysis and decision making
- Development of project scope and project execution plans focusing on cost estimate development
- Costs/Schedule control of capital projects during execution
- Closing the loop though knowledge management

Course Outline:
- Introducing AACE's total cost management framework and the guide of project controls compendium and reference. Effective business communication
- Total cost management process overview and capital project effectiveness
- Organization and leadership for total cost management
- Capital investment options identification and development
- Planning and scheduling. Introducing activity-based costing. Applied activity-based costing
- Review of best practices in scheduling. Executing the project from the plan.
- Practical applied earned value management using scandalized contract documents
- Strategic and service contracting types
- Field Cases

3.3 PETROLEUM COST ESTIMATION FUNDAMENTALS

Course Length: 5 Days
Course Dates: May 27 – 31, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Reliable cost estimates for construction, and operation and maintenance (O & M) of upstream petroleum projects are essential for their project planning and design. During the planning phases of the project, cost estimates are developed for major project components and for screening of alternatives. This course gives practical guidance on petroleum investment project cost estimating, cost control and claims analysis. Particular attention will be paid to the development of pricing data and understanding the perspective of owners, engineers, bidders, contractors, subcontractors, and other concerned parties with regard to quantifying the cost of a project's scope of work. Special attention is also focused on how cost estimates are affected when a project is delivered using alternative project delivery methods such as design-build, own versus lease, etc. Field case studies will be provided to illustrate many of the training key points

Who Should Attend?
This course is designed for project engineers, design engineers, consulting engineers, petroleum engineers, facility engineers and senior managers

What You Will Gain:
- Read cost engineering reports and put it in the perspective of your project
- Provide basic understanding of the definitions of cost engineering and estimation
- Learn how to examine issues of costing, pricing, adjustments and allowances
- Understand basic knowledge to prepare and evaluate estimates quicker and more accurately
- Ability to make your own factor estimates and validate factor estimates prepared by others
- Provide knowledge to identify major cost risks of engineering

Course Outline:
- Introduction to Cost Engineering. Estimating Methodologies Fundamentals. Organizing the Estimates. Work Breakdown Structure. Elements of Pricing. Indexing for Scale & Complexity. Escalation. Estimating of Equipment
- Feasibility Estimating. Generating the Initial Scope of Work. Schedule & Sequence of Design Work. Developing Early Petroleum Cost Factors. Estimate Components
- Conceptual Estimating. Cost Scoping the Conceptual Design. Schedule and Sequence of Petroleum Project Development. Developing Early Feature Estimates. Developing Assemblies
- Detailed Estimating (Vertical), Special Estimates (Vertical), Unit Price Estimating, Parametric Estimating, Detailed Estimating (Horizontal), Special Estimates (Horizontal)
- Factor Estimating - Different Factor Estimating Methods, Qualitative & Quantitative Estimating Methods, Estimate-Schedule Integration. Estimate Review & Validation. Risk Analysis
- Estimating of Engineering - Engineering Activities, Engineering Efforts in Engineering Project Phases, Methods of Estimating Engineering. Detailed Approach by Discipline. Field Cases

3.4 CAPITAL PROJECT COST CONTROL

Course Length: 5 Days
Course Dates: June 3 - 7, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This training course will focus on the capital project cost control process. The course covers the approaches, methods, techniques and tools suitable to plan, monitor, control and assess project performance in alignment with the AACE International total cost management framework. Field case studies will be provided to illustrate the field application of the capital project cost control fundamentals, methods, processes and practices

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, buyers, project accountants, project risk managers, accountants, financial analysts, procurement managers, business development managers

What You Will Gain:
- Understand the cost control process and workflow
- Best practices and tools that support effective planning, monitoring and control of capital project costs
- Plan-do-check-assess cycle

Course Outline:
- Project cost control overview. Project control processes and overview
- Project control cycle. Cost control versus cost management
- Measuring costs and resources. Measuring progress and assessing performance
- Budgeting management versus cost control (analysis and forecasting)
- Cost forecasting and change control principles
- Cost-schedule integration
- Project cost control - plan
    - Planning, scheduling, estimating, risk analysis, budgeting
- Project cost control - do
    - Cost accounting, performance measurement and earned value
- Project cost control - check
    - Performance analysis variance analysis, cost variance, cost performance index, performance reporting
- Project cost control - assess
    - Forecasting at completion, forecast calculation methods, change management principles and procedures, risk fund management, project recovery

3.5 PETROLEUM CAPITAL PROJECT COST & SCHEDULE RISK ANALYSIS

Course Length: 5 Days
Course Dates: May 13 – 17, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Planning and executing a successful capital project is one of the main objectives in oil and gas industry. A successful capital project is defined as a project completed in accordance with a given scope, within budget, and on time. Due to risks associated with complex projects, the use of probabilistic and Bayesian models for controlling cost and schedule overrun in petroleum capital projects has become very important. This course highlights fundamental and advanced methods for forecasting time and cost of petroleum capital projects at completion and/or at any intermediate time horizon. It will also present workflows for performing quantitative cost and schedule risk analysis in petroleum exploration and production projects' life cycle. Multiple case studies are presented to demonstrate capital project cost and schedule risk analysis processes in the upstream petroleum industry. Many practical group exercises will reinforce the concepts introduced throughout the course

Who Should Attend?
This course is designed for reservoir engineers, geologists, geophysicists, project managers, asset managers, senior managers and those involved in one or more functions related to managing and controlling capital projects including project management, project controls, cost engineering, estimating, scheduling, etc

What You Will Learn:
- How to better understand a project's risk and uncertainty, and improve the operational management of risks during the execution of project
- Understand foundations of forecasting time and cost of petroleum capital projects
- Understand the most important modeling techniques, methods and software tools available to perform & interpret project cost and schedule risk analyses using industry recognised software tools
- Measure the value of seeking additional information. How to use reserves as a separate account for discrete risk events that are not under the control of project team

Course Outline:
- Introduction to the Concept of Risk and Uncertainty. Introduction to Assessing Risk and Uncertainty (Probability and Statistics; Probability Distributions; Monte Carlo Simulation). Risk Identification
- Models. Understanding Risk Model Results. Contingency Determination to Support Risk Management
- Reserves Versus Contingency Cost & Schedule Risk Analysis Introduction
- The Basic Workflows of Building Project Cost & Schedule Models. Incorporating External Influence Variables & Expert Opinions. Linking & Analyzing Cost & Schedule Models Together
- General Best Practices
- Case Studies. Reflection & Overall Summary

3.6 PETROLEUM ECONOMIC EVALUATION AND PROJECT INVESTMENT DECISION MAKING UNDER UNCERTAINTIES

Course Length: 5 Days
Course Dates: May 20 – 24, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Sound project decisions require a comprehensive analysis of project costs, benefits, risks and other factors that may affect potentially affect project outcomes. This course reviews the limits of the traditional "levelized cost" approach to properly take into account risks and uncertainties when valuing different petroleum project investments. It introduces a probabilistic valuation model of petroleum investment projects and their applications for evaluating investment situations. It will discuss objective, systematic and practical methods to deal with decision-making under uncertainty. Case studies will be provided to illustrate the field applications.

Who Should Attend?
This course is designed for project engineers, geoscientists, reservoir engineers, production engineers, petroleum engineers, planning and development analysts, business planner, senior/ executive managers

What You Will Gain:
- Knowledge of tools and processes for evaluating projects and prioritizing investments decisions
- How to help a project developer evaluate the economic impact of his project, which accelerate ability to procure financing for the project. How to help several investment groups determine economics of new asset and value of existing assets. Provide investors with a much richer analytical and probabilistic framework to assess upstream petroleum investments. Learn how to define the potential alternatives to a problem or opportunity. How to identify the key drivers affecting our decisions and assess competing alternatives to maximize value in our decisions.
- Discuss methodologies of analyzing the combined impact of multiple uncertainties on the value of alternative technologies, the value of the operating flexibility and the value of mixed portfolios of different production technologies that present complementary risk-return profiles.

Course Outline:
- Overview of accounting basics, cost accounting, ratio analysis, investment decisions & profitability. Upstream petroleum economics, risk and fiscal analysis. Net cash flow
- Economic life and reserves. Distinction between cash flow and profit. Cash flow and tax. Cash flow & fiscal regimes. Incorporating inflation into cash flow projections. Real and nominal cash flows. Depreciation. Economic indicators and example economic evaluations using deterministic and probabilistic methods. Cash flow and risk analysis concepts. Time value of money
- Basics of decision analysis & investment decisions. Developing decision polices. Decision making process. Investment proposal ranking methods. Capital Management. Decision under uncertainty & risk. Risks and uncertainties in economic evaluation. Field case studies

3.7 PROJECT MANAGEMENT IN COST ENGINEERING

Course Length: 5 Days
Course Dates: May 6 – 10, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
It is common knowledge that capital projects often experience major cost overruns. Key areas that frequently contribute to cost blow out are: project management, stakeholder conflicts, resource constraints, regulatory changes and unfavorable external environments. Project management problems may include poor project planning, inaccurate cost estimating and poor supervision throughout the project lifecycle. This course covers the fundamental principles of capital project management. Case studies will be provided to illustrate the field application of the capital project management fundamentals, methods, processes and practices

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, buyers, project accountants, project risk managers

What You Will Gain:
- Skills and credibility in project management pertaining to capital cost engineering
- Practical know-how from practising experts with demonstrated ability
- Knowledge and skills to be actively involved in planning, implementation and evaluation stages of a range of functions in capital projects
- Best practice in capital cost engineering theories and practices

Course Outline:
- Introduction to Project Management - Project Management Methodologies. The Project Environment. The Project Life Cycles and Phases. The Project Organizational Structure. Project Offices and Project Support Offices. Project Teams and Leadership. Project Initiation, Project Scope Management, The Work Breakdown Structure, Project Code of Accounts and Project Communication
- Petroleum Economic Analysis - Enterprise Project Portfolio Management, Project Funding, Project Cash Flow, Asset Depreciation, Discount Factors, Payback, Return on Investment, Net Present Value, Internal Rate of Return,
- Cost Estimation and Budget Development
- Planning and Scheduling Techniques
- Project Procurement and Contract Types. Contract Agreement
- Preparation of Tender Document for Petroleum Capital Projects
- Bid Evaluation - Methods and Techniques
- Project Performance Measurements and Earned Value Management
- Project Risk Management
- Documentation and Records Management
- Case Studies

3.8 COST ESTIMATION OF PETROLEUM CAPITAL PROJECTS WITH DEPENDENT RISKS

Course Length: 5 Days
Course Dates: July 22 – 26, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
Due to high uncertainties and the cost intensive nature of upstream, midstream and downstream petroleum operations, accurate forecast of cost and duration is one of the main requirements for writing an AFE and supporting decision making processes. This course highlights limitations of traditional cost estimation methods that makes actual cost to exceed the planned budget. It presents the probabilistic approach of cost estimation along with risk assessment for dealing with cost estimation. This course covers the fundamental principles of simulation tools which are available in the market. Case studies will be provided to illustrate the field applications.

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, buyers, project accountants, project risk managers

What You Will Gain:

- Learn risk-based cost and duration estimation of petroleum capital projects
- Learn advantages and limitations of both deterministic and probabilistic cost estimation
- How to develop probabilistic approach and Monte Carlo simulation in cost estimation
- Understand cost estimation of large petroleum projects with dependent risks
- Understand cost risk analysis

Course Outline:

- Structure of Integrated Field Development Economic Model
- Introduction to Capital Cost Estimation and Management Concepts
- Purpose of Capital Cost Estimation and Management
- Classification of Capital Cost Estimates. Cost Indices. General Ground Rules & Assumptions
- Existing Methods for Early Capital Cost Estimation (Exponent, Factorial and Functional Unit Estimates). Capital Cost Estimates Using Top-Down Approach versus Bottom-Up Approach
- General need for better estimation tools and benefits of probabilistic cost analysis
- Characterization of risk and uncertainty. Risk classification. Risk matrices. Risk as individual cost elements. Introduction to cost estimation of large petroleum projects with dependent risks
- Structure of risk-based cost and duration estimation of capital petroleum projects
- Cost risk model and multivariate dependence. Cost aggregation in the multivariate framework
- New Regression Based Capital Estimation Methods. Computational Artificial Intelligence Model Based Capital Estimation Methods (Expert Systems, Artificial Neural Networks, Fuzzy Set Theory, Fuzzy Matching, Genetic Algorithms, Random Forest, hybrids, etc). Field Cases

3.9 CAPITAL PROJECT COST ESTIMATION OF PETROLEUM CAPITAL PROJECTS WITH COMMERCIAL SOFTWARE

Course Length: 5 Days
Course Dates: July 29 - August 2, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course will highlight how to obtain detailed petroleum capital project cost estimates from minimal input fraction of the time required by traditional methods. It presents fundamental principles of simulation tools which are available in the market and present the use of consistent methodology to reduce estimation variability. The course also covers the use of commercial cost estimator to evaluate petroleum capital projects and maximize return on investments. Case studies will be provided to illustrate the field applications and how to make adjustments to project estimates based on local area conditions and reduce potential decision-making risks.

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, project accountants, project risk managers, financial analysts

What You Will Gain:
- Understand how to build, interpret and revise estimates in fraction of the time required by traditional methods
- Learn to use commercial cost estimator to perform detailed cost estimates, perform cost tracking, evaluate petroleum capital projects and maximize return on investments
- Capability to generate consistent and reliable cost estimates in all phases of project lifecycle
- Learn to make adjustments to project estimates according local area conditions and reduce potential decision making risks
- Learn to use system documentation to promote consistent cost estimating methodologies and reduce estimation variability

Course Outline:
- Introduction to capital cost estimating concepts. Description of activity-based costing methodology
- Familiarization with commercial cost estimator software graphical user interface
- Elements of cost estimating model structure & modeling cost using commercial cost estimation software. Introduction to workflows for creating and building detailed project cost models
- Best practices to build a project cost estimates and the key elements for successful estimates
- Hands-on workshops to provide participants with many opportunities to use commercial cost estimation software and apply learned concepts to daily estimating demands. Project cost libraries
- Accurate project cost estimation and profitability management
- Working with project cost model data and performing what-if analysis
- Case Studies. Reflection & Overall Summary

3.10 QUANTITATIVE RISK ANALYSIS & MANAGEMENT WITH COMMERCIAL SOFTWARE

Course Length: 5 Days
Course Dates: August 5 - 9, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This course highlights core principles quantitative risk analysis and the most important modeling principles, methods and techniques. This course will be taught using the R statistical software package & other risk modeling tools. It will focus on how to conduct accurate and effective quantitative risk analyses, including best practices of risk modeling, selecting the appropriate distribution, using data and expert opinion, and avoiding common mistakes. Many practical group exercises will reinforce the concepts introduced throughout the course.

Who Should Attend?
This course is designed for reservoir engineers, geologists, geophysicists, project managers, asset managers, senior managers and those with professional interest to perform quantitative risk analysis in petroleum finance, project risk analysis, engineering design and operations, among others.

What You Will Learn:
- Understand required fundamental methodologies to effectively assess uncertainty and risks. Understand essential probability and statistics theory and various stochastic processes as related to quantitative risk analysis
- Understand the core principles of quantitative core principles of quantitative risk analysis and most important risk modeling principles
- How to conduct accurate and effective quantitative risk analyses including best practices of Risk Modeling employing R Software package and other quantitative risk modeling tools such as @Risk, Crystal Ball & other simulation tools
- Learn to think more probabilistically and promote the use of rigorous risk analysis
- Understand the value of portfolio analysis and risk optimization in E & P projects

Course Outline:
- Background of risk analysis and risk management. Risk analysis as a team effort. Decision tools by transforming data to knowledge. Dealing with the limits of sparse data sets. Introduction to probability theory. Basics of risk modeling. Workflows for Building Risk Analysis
- Overview of R statistical software package. Risk modeling workflows in R and other statistical software package. Introduction to analyzing and using data for risk analysis
- Stochastic processes - the basis of risk analysis. The use of Bayesian statistics in risk analysis
- General good practices in risk modeling. Common mistakes and how to prevent them
- Introduction to risk management. Risk management processes. Workflows for Managing Risks
- Case Studies. Reflection & Overall Summary

4. OIL & GAS JOINT VENTURE PROJECT FINANCING COURSES

4.1 OIL & GAS JOINT VENTURE PROJECT FINANCING

Course Length: **5 Days**
Course Dates: **August 5 - 9, 2019 (Adjustable)**
Course Venue: **Calgary (Canada), Dubai (UAE), London (UK) or Houston (USA)**
Amount: **US$5,000**

Overview

The global Oil and gas industry faces a major funding challenge. Despite the industry's immense appetite for capital, compared to other capital-intensive industries, it has been relatively conservative when it comes to financial structuring. In addition to traditional sources of capital, more creative financing techniques and new sources of finance will need to be explored to ensure that sufficient and efficient funding is available to finance projects in the future. In response to heightened political and economic instability, companies have begun to diversify their sources of funding. This has involved a shift from bank-led financing to non-bank and capital markets-based funding.

This course presents the fundamentals of oil and gas joint venture project finance, techniques for financing Incorporated Joint Venture and Un-incorporated Joint Venture and the parameters that influence the financial aspects of oil and gas joint venture projects in developing countries. The course also addresses the rationale for capital and operational project financing, and examine project risk analysis, risk mitigation strategies, financing options, commercial and legal frameworks. This course will also provide a framework for analyzing complex petroleum capital and operational projects from first principles and present a practical and quantitative approach to understanding petroleum project finance transactions in developing countries. This course is intended to be very interactive using case studies such as Petroleum Development Oman (PDO), Pemex/Schlumberger, Strategic Alliance Financing, etc. The course will be supplemented by practical and up-to-date case work designed to consolidate and reinforce learning. In addition to a core case study built specifically to drive home the techniques and tools taught during the 'toolkit' sessions, other cases will be drawn from oil and gas joint venture value chain as the Workshop proceeds.

Who Should Attend?

This course is designed for accomplished leaders who drive growth in every corner of their organizations - managing directors, executive directors, assets managers, operation managers, cost controllers, accounting executive/managers, financial reporting managers/executives managers/ executives/ managers/ controllers/ directors, budgeting officers/ executives/ managers, auditors/auditing managers, taxation and reporting executives/managers, business/investment analysts & managers, economists, regulatory compliance officers, business development executives & managers, commercial analysts, oil and gas operators, joint venture operators, joint venture non-operators, joint venture accountants, government regulators, and others

What You Will Gain:

- Identifying and exploring key aspects of financing for oil and gas joint venture capital project, potential sources of funding as well as basic financial metrics
- Explaining clearly and in detail, project financing techniques and structures typically used in oil and gas joint venture operations
- Providing oil and gas joint venture project financing toolkit incorporating project risk appraisal and mitigation,

project qualitative analysis and debt sizing structures, project finance loan documentation

- Understanding how different oil and gas joint venture project finance models are built and used to determine loan values, balance equity against debt, optimize debt amounts, maturity and repayment
- Analyzing why and when sponsors use project financing techniques, and method of incorporating appropriate financing into decision making pertaining to petroleum capital projects
- Analyzing and interpreting how debt and equity are balanced within project financing structures
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with oil and gas joint venture project financing

Instructor (s):

This course will be taught by a globally respected oil and gas joint venture project finance practitioner with decades of lending and advisory experience

Course Content

- Overview of oil and gas contract agreement types. Oil and gas joint venture principles
- Fundamentals of oil and gas joint venture capital and operational project financing techniques
- Overview of cash calls types for oil and gas joint venture operations
- Incorporated joint venture and un-incorporated joint venture oil and gas project financing
- Project finance modeling in different oil and gas joint venture operations
- Oil and gas project financing toolkit (1): qualitative risk identification, analysis and mitigation
- Oil and gas project financing toolkit (2): quantitative risk analysis and debt sizing /structuring
- Types of loan documents which govern financing of Incorporated joint venture and un-incorporated joint venture projects
- Case studies - studies such as Petroleum Development Oman (PDO), Pemex / Schlumberger, Strategic Alliance Financing, etc.
- Group exercises to identify and offer solutions to specific problems associated with oil and gas joint venture project financing

4.2 CASH CALLS IN OIL & GAS JOINT VENTURE OPERATIONS

Course Length: 5 Days
Course Dates: August 12 - 19, 2019 (Adjustable)
Course Venue: Calgary (Canada), Dubai (UAE), London (UK) or Houston (USA)
Amount: US$5,000

Overview

Upstream oil and gas projects can be too immense for a single company (even a super-major) to finance on their own. Many of the larger deepwater and liquefied natural gas projects fall into this category. The risk profile attached to large-scale exploration and production projects is such that no single company would want to take on full exposure. In an increasingly cost-focused climate, economies of scale are critical to success and partnering may help to achieve this. This partnership often requires the operator of joint venture assets to make cash calls for anticipated future capital and operational expenditures from non-operating partners. Operations often suffer immensely whenever any of the partners' lack capacity to raise capital to finance its share of the joint venture cash calls due to financial struggles.

This course presents oil and gas joint venture principles covering contract types that includes unincorporated joint ventures ("UJVs") and incorporated joint ventures ("IJVs") contracts. The course also highlights critical issues relating to implementing oil and gas joint venture accounting, budgeting and auditing processes. This course will also present overview of cash calls for joint venture operations, principles of cash call accounting and reporting; types of cash calls in joint venture contract's fiscal policy; fundamentals and workflows for cash calling in joint venture contracts; outstanding cash calls and repayment options; impact of cash default on joint venture operations and profitability. Both the structural aspects of cash calling as well as well as real-world case studies will be discussed to illustrate the field application of the concepts in the course.

Who Should Attend?

This course is designed for managing directors, executive directors, assets managers, operation managers, cost controllers, accounting executive/managers, financial reporting managers, financial executives /managers/controllers/directors, budgeting officers/executives/managers, auditors / auditing managers, treasurers, taxation and reporting executives/managers, JV/Production Sharing executives/managers/advisors, business/investment analysts & managers, asset officers/managers, economists, regulatory compliance officers, business development executives & managers, commercial analysts, oil and gas operators, joint venture operators, joint venture non-operators, joint venture accountants, government regulators, and others

What You Will Gain:

- Understanding the key attributes of the joint venture business structure as well as the risks and benefits associated with forming joint ventures
- Knowledge of basic processes in oil and gas joint venture accounting, budgeting and auditing. Describing the elements that constitute master data in joint venture accounting
- Explaining the processes performed periodically in oil and gas joint venture accounting and reporting. Explaining the key steps for updating elements of master data in joint venture accounting and integrating with other SAP processes
- Understanding and exploring cash call types for oil and gas joint venture operations

- Applying practical tools and skill sets to analyze cash calling in joint venture contracts and evaluating impact of cash default on joint venture operations and profitability
- Using case studies & interactive work/group discussion to apply the skills and knowledge acquired during the training course

Instructor (s):
This course will be taught by globally respected international oil and gas joint venture financial accounting experts with decades of industry and technical advisory experience

Course Content
- Overview of the oil and gas contract agreement types; and oil and gas joint venture principles
- Oil and gas project financing fundamentals along the joint venture value chain
- Incorporated joint venture and un-incorporated joint venture contract types in oil and gas industry
- Joint venture contract's fiscal regimes resulting in cash calls
- Overview of cash call types in oil and gas joint venture operations
- Processes for cash call funding and account reconciliation
- Recoverable and non-recoverable costs in joint venture operations
- Fundamentals of joint venture budgeting
- Basic processes in oil and gas joint venture cash call accounting and reporting
- Processes performed periodically in oil and gas joint venture cash call accounting
- Outstanding cash calls (deficit) and repayment options
- Entitlement oil/gas of joint venture partners & accounting for deficit cash calls
- Carried interest in cash call payment
- Modified carry arrangement and impact of cash default on operations and profitability
- Case studies
- Group exercises to identify and offer solutions to specific problems associated with cash calls in oil and gas joint venture operations

4.3 FUNDAMENTALS OF OIL AND GAS FINANCIAL ANALYSIS AND CAPITAL BUDGETING

Course Length: 5 Days
Course Dates: August 19 - 23, 2019 (Adjustable)
Course Venue: Calgary (Canada), Dubai (UAE), London (UK) or Houston (USA)
Amount: US$5,000

Course Description:
This course will present an overview of the key economic principles and financial concepts to evaluate investment opportunities – new business, expansion of existing business, modernization, backward and forward integration, etc. The course will provide an overview of economic valuation tools that are needed for optimizing petroleum project selection requiring investments with equity or debt capital under uncertainty. It will also highlight various financial analysis and capital budgeting techniques to evaluate investment opportunities, authorize capital spending and ongoing operations' innovation and growth. It will demonstrate the value of following the financial analysis and capital budgeting process, and introduce the three stages in that process – project identification and screening, quantitative assessment, and capital allocation and rationing. Case studies will be provided to illustrate the field applications of financial analysis and capital budgeting tools on the basis of value-added to the corporation over an applicable period of time (future).

Who Should Attend?
This course is designed for petroleum engineers, business planner & analysts, senior/ executive managers, strategy specialists, market intelligence experts

What You Will Gain:
- Understanding how reserves are classified and the process of exploring, appraising and producing
- Understanding basic financial and capital budgeting concepts in relation to the oil and gas industry
- Exploring how to identify opportunities for capital investment based on preliminary screening, alignment with organizational strategy and dependence on other projects.
- Demonstrating how to use net present value, internal rate of return, discounted payback period and profitability index for capital investment projects
- Understanding the process of allocating capital based on qualitative assessment factors, incorporating other qualitative factors (such as the priority of projects), monitoring and post-monitoring auditing

Course Outline:
- Exploration & production fundamentals. Overview of accounting basics, cost accounting, financial statement analysis, financial ratio analysis, investment decisions & profitability. Upstream petroleum economics, risk and fiscal analysis. Overview of current regulatory regimes. Financing the corporation.
- Valuation of a company. Oil and gas economic valuation tools (simple payback period, accounting rate of return, net present value, discounted payback period and profitability index). Distinction between cash flow and profit. Net cash flow analysis and tax. Cash flow & Incorporating inflation into cash flow projections. Real and nominal cash flow analysis. Depreciation. Cash flow and risk analysis concepts. Discounting and time value of money. Valuation of risky assets and portfolios
- Fundamentals of cost analysis & control. Financial analysis, audit & management. Project financing
- Capital investment planning and analysis. Capital budgeting processes. Capital allocation. Creating and analyzing an operating budget. Ins and outs of capital budgeting. Effective budget management
- Basics of decision analysis & investment decisions. Developing decision polices. Decision making process. Investment proposal ranking methods. Capital management. Decision under uncertainty & risk. Risks and uncertainties in economic evaluation. Field case studies

4.4 NATURAL GAS MARKETING AND TRANSPORTATION

Course Length: 5 Days
Course Dates: August 12 - 16, 2016 (Adjustable)
Course Venue: Calgary (Canada), Dubai (UAE), London (UK) or Houston (USA)
Amount: US$5,000

Course Description:
This course provides an overview of the natural gas supply chain fundamentals – natural gas resources, production, transportation, purification processes, marketing, economic and contractual aspects. The course will also cover the valuation of natural gas. Natural gas transportation and freight as well as overview of terminals and pipelines will be highlighted. The structure of natural gas processing (highlight gas compression, dehydration, acid gas removal and tail gas cleanup, sulfur recovery, cryogenic extraction of natural gas liquids as well as LNG production, storage and transportation) will be explained in the context of the need to produce marketable products. Key aspects of product quality will be covered together with the major processing workflows to achieve them. The course will also cover fundamentals of natural gas supply & demand, regulation, pricing, price risk management, purchase and sales contracts. Case studies will be provided to illustrate the field application.

Who Should Attend?
This course is designed for professional personnel inside and outside petroleum industry who interface with supply, processing, transportation and trading functions of natural gas (engineers, planning and development analysts, business planner, senior/executive managers, market intelligence specialists, Oil & Gas value chain decision makers)

What You Will Gain:
- Evaluating the importance of natural gas in the world energy balance, and the strategies of the main industry actors
- Identifying the outlets of natural gas and the new trends in gas industry
- Identifying the main technical, economic and contractual features of the natural gas value chain, from the production well to the final consumer
- Understanding the framework of liberalization of natural gas markets and its impact on natural gas contract and prices
- Understanding natural gas contracting principles

Course Outline:
- Importance of natural gas in the world energy balance. Outlets for natural gas. Reserves, production and development processes. Natural gas storage. Price natural gas purchase and sales contracts
- International gas markets. Natural gas supply and demand. Natural gas regulation and pricing. Impact of unconventional gas on the world demand/supply and on gas prices. Natural gas risk management
- Description of the natural gas chain and associated costs. Natural gas conditioning, processing and transportation. Storage costs and distributions costs. Liquefied natural gas (LNG), FLNG, FSRU, small scale LNG. Prices in the different markets. Financial contracts and hedging strategies
- Contractual-framework of exploration-production. Structure and principles of a long-term contract. Principles of take-or-pay, netback, indexation and gas price formulas. Tolling agreements
- Spot and forward natural gas markets. Why and how to access those markets? Drivers and concepts of liberalization. Role of the regulator, network development, transport, tariffs, etc. Contractual s aspects of suppliers, transporters and distributors
- Multiple examples and field case studies

4.5 UPSTREAM OIL AND GAS BUSINESS PROCESSES

Course Length: 5 Days
Course Dates: September 2 - 6, 2019 (Adjustable)
Course Venue: Calgary (Canada), Dubai (UAE), London (UK) or Houston (USA)
Amount: US$5,000

Course Description:
This course will present an overview of the upstream oil and gas industry, business processes and its value chain (exploration, drilling, formation evaluation, well completions, reservoir depletions mechanisms, oil and gas production facilities, transportation, maintenance of oil and gas facilities, oil and gas reserves, and reservoir management). It will also highlight oil and gas terms, legal framework of the industry, project economics, oil price risk management, business planning, new business – opportunities and risk taking, marketing and retailing as well as high performing assets. It will cover domestic and cross-border state of the art petroleum industry supply chains as well as typical requirements of the hydrocarbon and product logistic of multinational, national and independent oil and gas companies. This course is built on case studies, interactive presentations, exercises and team games to illustrate the field applications of strategic management in oil and gas business.

Who Should Attend?
This course is designed for leaders who drive growth in every facet of their organizations. Appropriate experience levels include executive and senior leadership including managing directors, C-level executives, project directors and assets/operations managers.

What You Will Gain:
- Understanding the main economic, market, physical, environment and political forces driving energy demand, supply and prices. Connecting the key links and terms of the oil and gas industry, from the exploration well to the final products.
- Best practices in managing the oil & gas industry's strengths, weaknesses, opportunities & threats
- Understanding the fundamentals management tools and decision processes in an international oil and gas company. Quantifying the risk and opportunity exposures of different stakeholders
- Applying practical decisions and experience to the risk of doing business in the global oil and gas industry using SWOT analysis, excel simulator, case studies, videos and discussions

Course Outline:
- Overview of business processes, drivers and terminology relevant to oil and gas industry – from exploration and production to midstream and downstream. Oil and gas business terms. Understanding the exploration and production value chain. Legal and fiscal framework for exploration-production (concessions, joint ventures, production sharing contracts, service contracts, etc)
- Energy demand and supply. Crude oil reserves and production. Role of main actors – OPEC, NOCs, INOCs and IEA. Oil price evolution and long-term scenarios. Present and future constraints of the oil and gas industry (renewable and alternative energies, investments, etc)
- Understanding how reserves are classified and the process of exploring, appraising and producing. Main gas & crude oil markets as well as their structures & constraints. Liquefied natural gas chain, economics & trade. Long term sales & purchase gas contracts. Take or pay provisions & gas price formulas. International trade & shipping of crude and products. Various types of markets and contracts
- Basics of decision analysis & investment decisions. Decision making processes. Investment proposal ranking methods. Capital management. Decision under uncertainty & risk. Risks and uncertainties in economic evaluation. Alternative futures for the industry.
- Field case studies

5. FACILITY MANAGEMENT AND PRODUCTION ENGINEERING COURSES

5.1 PRODUCTION & MULTIPHASE METERING TECHNOLOGY

Course Length: 5 Days
Course Dates: June 3 - 7, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This training course provides an overview of the modeling and surveillance methods to understand petroleum production performance problems and to design remedial actions to optimize production. The course also defines basic principles and requirements for deploying multiphase flow metering technologies in support of integrated production system operations.

Who Should Attend?
This course is designed for production engineers, completion engineers, reservoir engineers, facility engineers and asset managers

What You Will Learn:
- How to establish the performance of a hydrocarbon producing well in natural and artificial flowing conditions
- How to model the interactions between the reservoir deliverability and the wellbore completion
- How to identify potential problems and warning signs from the well's behavior
- How to recognize different remedial actions to restore or improve well deliverability
- Know the use of multiphase flow meters in real-time monitoring and optimization of well and reservoir performance, and reserves estimation

Course Outline:
- Inflow performance (single and two-phase flow, steady vs steady state)
- Outflow performance model (multiphase correlations for tubing and choke)
- Artificial Lift modeling (Gas Lift, Pump Assisted)
- Complex well performance (horizontal, multilateral, smart/intelligent wells)
- Well expected performance
- Well performance forecasting with time
- Production test validation and well transient analysis (pressure, skin and drainage area)
- Well operating envelope (well operating guidelines)
- Near wellbore skin analysis and chemical impairment (scale, salt, wax and asphaltene)
- Well diagnosis with production logging and other (e.g. echometer)
- Acidizing (Matrix, carbonate) and hydraulic fracturing (High vs low perm)
- Water and gas management (coning, conformance)
- Chasing barrels behind casing (re-Perforation, plugs, re-entries, sidetracks)
- Artificial lift optimization (Gas Lift, Pump Assisted)
- Mutiphase flow metering technologies
- Erosion and corrosion
- Class exercises

5.2 HYDROCARBON METERING TECHNOLOGY AND PRODUCTION ACCOUNTING

Course Length: 5 Days
Course Dates: October 14 - 18, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
This training course provides an in-depth consideration of all aspects of hydrocarbon metering technologies and production accounting. The course describes in general terms the evolution and need for well metering techniques. The course defines basic principles and requirements for deploying modern well metering tools in support of design and operations of integrated production systems. The course will also explain how to apply modern well metering system in production accounting, production allocation, reserves estimation, history matching, production optimization and reservoir management.

Who Should Attend?
This course is designed for metering engineers, production engineers, facility engineers, design engineers, station operators, service staff and inspectors of custody transfer stations

What You Will Learn:
- Gain an understanding of the fundamentals of metering technologies in petroleum industry
- The current status and limitations of the available metering technologies
- Understand foundations of multiphase flow metering techniques
- Develop clear guidelines for uncertainty management in hydrocarbon flow estimation
- Become familiar with virtual flow metering systems and their configuration process
- Know the use of conventional and virtual flow meters in real-time monitoring and optimization of well/reservoir performance, formation properties estimation, production forecasting, reserves estimation

Course Outline:
- Needs and drivers for hydrocarbon metering in petroleum industry
- Hydrocarbon flow metering applications
- Custody transfer, fiscal allocation and reservoir production allocation
    - Production testing (well and pipeline surveillance)
    - Well testing and reserves tracking
    - Production optimization
    - Reservoir management
- Fundamentals of hydrocarbon flow metering systems
- Design, installation and operations of hydrocarbon flow metering systems
- Uncertainty management in hydrocarbon flow estimation
- Overview of hydrocarbon flow metering technologies currently used in the oil and gas industry
- Theory and applications of production accounting systems
- Case histories

5.3 PLANT OPERATIONS, MAINTENANCE, MANAGEMENT & CONTROL

Course Length: **5 Days**
Course Dates: **November 18 - 22, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
This course reviews the design of a typical operation management program to promote safety and environmental protection during oil and gas production/plant operations. It includes description of the typical operations in oil and gas production facilities and infrastructure and also defines the key interfaces that exist in plant operation management. Codes and standards applicable to piping systems are described.

Who Should Attend?
This course is designed for operations managers, maintenance engineers/planners, supervisors.

What You Will Learn:
- Typical "best practices" used in plant operations
- Guidelines and recommendations for the required process to reach an acceptable and controlled exposure to risk during operations, for personnel, environment, assets and reputation
- The key considerations for flare and vent systems
- Root cause analysis and its use in problem solving and prevention
- Quality assurance and mechanical integrity of critical equipment
- Risk management and hazard analysis
- Preventive and predictive maintenance management concepts
- Reliability centered maintenance management concepts

Course Outline
- Personal Safety and Process Safety
- Hazards analysis & Management of change (MoC)
- Assurance of quality and mechanical integrity of critical equipment
- Audit of safety and environmental management program elements
- Integrated Workflows for Risk, Reliability and Failure Analysis
- Best Practices for Safety Program, Human Factors Tool for Existing Operations, Process Drawings, Communications, Weight Control, Operational Logs, Key Interfaces during Plant Operations, and Codes & Industry Standards
- Plant Management for Onshore Production Facilities, Offshore Production Facilities, Gas Plants, and Pipelines
- Roles of Maintenance Planning & Scheduling in Maintenance Management & Control
- Direct Assessment- Corrosion Assessment Methods (ASME-B31.G) - Techniques to Assess Manufacturing Metal Loss Defects, Dents, Gouges, Gouge-Dent Combinations, Cracks (API 579), Laminations (API 579)
- Assurance of Quality and Mechanical Integrity of Critical Equipment
- Preventive and Predictive Maintenance Management Concepts & Workflows for Rotating Equipment Operations, Hydraulic System Operations, Pump and Compressor Operations, Piping and Valves, Electrical Motor & Control Operations, Electrical Switchgear Operations, etc

5.4 ADVANCED PROCESS SIMULATION FOR IMPROVED HYDROCARBON PROCESSING FACILITY MANAGEMENT

Course Length: 5 Days
Course Dates: June 3 - 7, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
The course presents new methods and applications to create competitive designs for both current and future hydrocarbon process or equipment needs that is capable of operating in challenging situations. The course will further provide practical deterministic and probabilistic simulation modeling and optimization workflow for key management decisions during hydrocarbon processing and conditioning operations. Case studies on the applications of deterministic and probabilistic based simulation techniques to process and equipment designs in middle and downstream petroleum industry are also illustrated.

Who Should Attend?
This course is designed for professional process engineers, facility engineers, operation engineers, and asset managers

What You Will Learn:
- Basic knowledge and fundamentals of available commercial simulation tools
- Planning and executing simulation and optimization projects
- Understand the use of steady state simulation tools for process and equipment design
- Understand the use of dynamic simulation tools for process and equipment design
- Understand the use of stochastic -based simulation tools for process and equipment design
- Improve basic concepts in process economics and risk assessments
- Apply uncertainties in process and equipment design
- How to develop simulation model workflow for FEED studies
- How to perform troubleshooting and/or de-bottlenecking of existing facilities to optimize operations

Course Outline:
- Overview of hydrocarbon processing and conditioning
- Overview of process simulation procedures
- Key steps in carrying out process simulation
- Simulation concepts and tools
- Coping with uncertainties in process and equipment simulation
- Process synthesis in hydrocarbon processing and conditioning
- Simulation tools for hydrocarbon processing and conditioning
- Closed-loop process management
- Class exercises

5.5 TANK FARM DESIGN, OPERATION & MAINTENANCE

Course Length: **5 Days**
Course Dates: **August 5 - 9, 2019 (Adjustable)**
Course Venue: **Calgary, Alberta, Canada**
Amount: **US$4,900**

Course Description
This course provides an overview of all significant aspects and considerations of tank in accordance with the international standards for those who are involved in the inspection, repair, alteration and reconstruction of tank and tank farms.

Who Should Attend?
This course is designed for tank farm managers, engineers, superintendents, supervisors, and operators maintenance engineers/planners, superintendents, supervisors, NDT technicians inspectors and engineers involved with storage tank design, maintenance and inspection.

What You Will Learn:
- Distinguish function of structural parts of and fittings to conventional storage tanks,
- Design and operational aspects of storage tanks, set up inspection and maintenance programs/schedules
- Differentiate maintenance methods (condition/repair)
- Define the maintenance scope
- Case studies and exercises are used to reinforce key points

Course Outline
- Tank farm layout and types of tanks
- Tank design considerations and fabrication
- Tank in-Service inspection / maintenance
- Tank repair and alteration requirements
- Determination of need for cathodic protection, methods of cathodic protection for corrosion control, and design of cathodic protection systems
- Tank farm safety, statutory and safety requirements, HSE recommendations for tank farm, and welding safety
- Materials selection principle for storage tanks and certification requirements

5.6 PETROLEUM PRODUCTION ENGINEERING - I

Course Length: 5 Days
Course Dates: April 29 - May 3, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
There are numerous oil and gas wells around the world that have not been optimized to achieve an objective rate efficiently. Petroleum production engineering is a key discipline for the optimization of oil and gas wells. It is effective when used to evaluate thoroughly a complete producing system. Every component in a producing well can be optimized to achieve the most profitable flow rate. Production optimization opportunities can be generated at different levels, from reservoir and near wellbore remediation to vertical lift performance improvement via the additional and optimization of artificial lift. All well components, beginning with the static reservoir pressure, inflow performance, flow across the completion, up the tubing string, surface choke, horizontal flow lines, and into the separator must be carefully understood and analyzed. This course provides an overview of the modeling and surveillance methods to understand petroleum production performance problems and to design remedial actions to optimize production

Who Should Attend?
This course is designed for professional process engineers, facility engineers, operation engineers, and asset managers

What You Will Gain:
- Establish the performance of a hydrocarbon producing well in natural and artificial flowing conditions
- Learn how to model the interactions between the reservoir deliverability and the wellbore completion
- Identify potential problems and warning signs from the well's behavior
- Recognize different remedial actions to restore or improve well deliverability

Course Outline:
- Production Modeling fundamentals
    - Inflow performance (single and two-phase flow, steady vs steady state)
    - Outflow performance model (multiphase correlations for tubing and choke)
    - Artificial Lift modeling (Gas Lift, Pump Assisted)
    - Horizontal well performance
    - Completions for complex well architectures (multilateral, smart wells, ICD's)
- Well Production Performance Evaluation
    - Well expected performance
    - Production test validation and well performance forecasting
    - Pressure transient testing and productivity analysis (pressure, skin and drainage area) for vertical and complex well architectures
    - Integrated reservoir/wellbore transient modeling in oil and gas wells
    - Well operating envelope (well operating guidelines)
- Petroleum Operation Production Problems Diagnosis

- Near wellbore skin analysis
- Chemical impairment (scale, salt, wax and asphaltene)
- Erosion and corrosion
- Well diagnosis with production logging and other (e.g. echometer)

- Production Optimization and Remedial Options
  - Acidizing (Matrix, carbonate)
  - Hydraulic Fracturing (High vs low perm)
  - Water and gas management (coning, conformance, liquid loading)
  - Chasing barrels behind casing (re-Perforation, plugs, re-entries, sidetracks)
  - Artificial Lift Optimization (Gas Lift, Pump Assisted)
  - Optimizing well performance by downhole temperature and pressure data
  - Dynamic waterflooding optimization with intelligent wells
  - Production optimization of remotely operated oil and gas wells
  - Asset production optimization
    - Optimization formulation (objective function, decision and constraints)
    - Optimization engines and methods
    - Cost modeling and economic KPI management (NPV, RoR, $/bbl, $/bpd)
    - Opportunity prioritization process
    - Production improvement opportunity decision making
    - Production Data Management Systems
- Oilfield Instrument status management
  - Data filtering and conditioning
  - Data validation and reconciliation
  - Production volume back allocation and well rate estimation
  - Application of function approximation to reservoir and production engineering
  - Monitoring and alarms

Class Exercises

- Vertical well Inflow and outflow modeling and analysis
- Gas well performance modeling and analysis
- Horizontal well modeling and analysis
- Multilateral and multiple zone well model analysis
- Well performance forecast in time
- Artificial lift performance modeling (gas-lift)
- Artificial lift performance modeling (pump-lift)
- Pressure transient analysis for determining pressure and skin
- Completion flux operating envelope operating guidelines
- Well diagnosis with production logging

5.7 PETROLEUM PRODUCTION ENGINEERING - II

Course Length: 5 Days
Course Dates: June 10 – 14, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$4,900

Course Description:
The increase of upstream activities both in current and new reservoirs, in increasingly challenging work locations, demand to work more efficiently, avoiding risk to people, capital, and environment. Therefore, monitoring the production operations has been emphasized creating large volumes of production data which is necessary to store, explore, and analyze. Management and use of this big data is critical for the oil industry. Production data analysis from different perspectives provides a platform for converting data it into information and knowledge. Integration of production data into the practice of petroleum production engineers is essential to establishing a vision for the oil and gas industry to move toward data-based decisions in the production and operations arena. This course will provide an overview of the advance production engineering methods by exploiting the sue of available data and data driven technologies actions to optimize asset production.

Who Should Attend?
This course is designed for professional process engineers, facility engineers, operation engineers, and asset managers

What You Will Gain:
- Evaluate the performance of a hydrocarbon producing system by analyzing various data sources
- Recognize production data patterns to unveil of petroleum production performance problems and remediating solutions
- Discriminate general steps in the life cycle of production data from sensor generated data to usability
- Optimize asset production by integrating production improvement decisions, field operating constraints and economics models
- Build integrated asset models incorporating performance of reservoir, wells and surface facilities

Course Outline:
- Production Data management
    - Oilfield Instrument status management
    - Data filtering and conditioning
    - Data validation and reconciliation
    - Production volume back allocation
    - Well rate estimation (Indirect Virtual rate metering)
- Data mining and production surveillance
    - Critical data and desirable data
    - Data mining methods for production data clustering
    - Data driven modeling for production performance modeling
    - Statistical analysis (mean, deviation, percentiles, frequency, etc)
    - Exception based surveillance
- Integrated production modeling
    - Interaction from near wellbore to separator flow path for a single well
    - Reservoir, wells and facilities

- Asset Production Optimization
    - Optimization formulation (objective function, decision and constraints)
    - Optimization engines and methods
    - Cost modeling and economic KPI management (NPV, RoR, $/bbl, $/bpd)
    - Opportunity prioritization process
    - Production improvement opportunity decision making

5.8 HYDROCARBON CONDITIONING AND PROCESSING

Course Length: 10 Days
Course Dates: June 3 - 14, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$7,500

Course Description
This course is designed to provide a complete and up-to-date overview of the concepts and techniques that govern hydrocarbon conditioning and processing. It also presents practical workflows for selection and specification; engineering analysis and design data; engineering analysis and design methods; construction; operations; inspection; maintenance and repairs; cost estimation of process equipment in hydrocarbon conditioning and processing plants using case studies to highlight the topics discussed. The course will be supplemented by practical class-based project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning, and identify and offer solutions to specific problems associated with hydrocarbon conditioning and processing plants. In addition to the core case studies built specifically to drive home the techniques and tools taught during the training sessions, other cases will be drawn from hydrocarbon conditioning and processing plants value chain as the workshop proceeds.

Who Should Attend?
This course is designed for professional process engineers, facility engineers, operation engineers, and asset managers

What You Will Gain:
- Understanding of the planning, concept development, design, construction, installation, operation, inspection and maintenance of hydrocarbon conditioning and processing plants
- Applying proper principles, procedures and techniques in the selection, design, sizing and trouble-shooting of hydrocarbon conditioning and processing plants and equipment
- Calculating, evaluating and compiling basic process data essential for design of hydrocarbon conditioning and processing plants equipment
- Performing evaluations of existing hydrocarbon conditioning and processing plants and equipment designs and/or retrofitting methods
- Preparing comprehensive hydrocarbon conditioning and processing plants design specification document package
- Preparing scoping cost estimates and conducting evaluations of hydrocarbon conditioning and processing plants equipment and contractors' design proposals
- Maintaining and trouble-shooting hydrocarbon conditioning and processing plants equipment, and familiarity with most updated inspection and maintenance techniques
- Successfully applying the codes of inspection and identifying the types of preventive and recommended practices for maintenance in hydrocarbon conditioning and processing plants and equipment
- Implementing the various methods, metrics and processes used in integrity assessment and qualification of hydrocarbon conditioning and processing plants and equipment. This will also include learning the processes involved in qualifying hydrocarbon conditioning and processing plants equipment for life extension projects,

and the methods typically implemented in life extension analysis
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with hydrocarbon conditioning and processing plants

Training Methodology

The training course will combine lectures (30%) with workshop/work presentations (30%), interactive practical exercises and case studies (20%), supported by video material, software and general discussions (20%)

Course Contents

Day 1: Introduction to Hydrocarbon Conditioning and Processing Systems

- Oil, gas and condensate reservoirs
- Reservoir fluids phase behavior phenomena
- Characterization of oil, gas and condensate
- Thermodynamic modeling concepts and thermodynamic properties estimation
- Integrated asset model: reservoir models, completion models, wellbore models, surface-pipeline models and surface process models
- Hydrocarbon conditioning and processing overview
- Needs for hydrocarbon processing & conditioning
- Concept selection for process development
- Preparation of block flow diagrams (BFDs)/process flow diagrams (PFDs)/piping and instrument diagrams (P & IDs)
- Units operations and flow sheeting; handling material and energy recycles
- Understanding interactive flow sheeting/degrees of freedom/bi-directional data propagation
- Preparation of plant & equipment Layout
- Materials selection
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 2: Natural Gas Conditioning and Processing Systems

- Natural gas and condensate stabilization
- Introduction to natural gas and condensate stabilization
- Fundamentals of natural gas and condensate stabilization
- Exercise on natural gas and condensate stabilization
- Materials selection for natural gas and condensate stabilizers
- Standards & codes for natural gas and condensate stabilization
- Practical examples
- Field case studies
- Group exercises
- Simulation elements
- Characterization of natural gas and condensates (phase envelopes, retrograde behavior, presence of liquids, etc)

- Hydrates - formation, prediction and inhibition
- Gas-liquid separation
- Gas scrubbers and slug catchers
- Compression
- Heat exchangers (air coolers)
- Fractionation/column rating
- Practical examples and field case studies
- Group exercises

Natural gas/condensates transmission and processing

- Natural gas/condensates transmission
- Water content and dew-point control
- Hydrocarbon dew-point conditioning and NGL recovery
    - Liquid absorption
    - Solid desiccant adsorption
    - Joule-Thompson (JT) plants
    - Turbo expanders
    - Refrigeration plants
    - Propane refrigeration
- Dehydration and glycol regeneration
- Gas sweetening (removal of acid gases - H_2S, CO_2, CS2, COS, RSH, etc)
- Practical examples and field case studies
- Group exercises

Other topics

- Sulphur recovery system and acid gas injection system
- Knock out drums and flare system
- Plant piping and pumps
- Utilities (hot oil, etc)
- Process controls - pressure, level, flow and temperature measurements
- Emission and other environmental considerations
- Practical examples and field case studies
- Group exercises

Day 3: Crude Oil Stabilization and Separation Systems

Crude oil stabilization

- Introduction to crude oil stabilization
- Fundamentals of crude oil stabilization
- Exercise on crude oil stabilization
- Materials selection for crude oil stabilizers
- Standards & codes for crude oil stabilization
- Practical examples on crude oil stabilizers
- Field case studies on crude oil stabilizers
- Group exercises on crude oil stabilizers

Crude oil separation

- Introduction to oil and gas separation
- Fundamentals of separation
  - Types of separators
  - Two-phase separators
  - Three-phase separators
- Gas scrubbers
- Slug catchers
- Separator internals
- Separator controls
- Oil/Water separator sizing & design
- Operational problems
  - Foams
  - Paraffins
  - Sand
  - Emulsions
  - Carryover and blow-by
- Crude oil dehydration
  - Introduction to crude oil dehydration units
  - Flocculation
  - Coalescence
  - Sedimentation
  - Heat
  - Chemicals
  - Electricity
  - Retention time
  - Free-water knock out
  - Heater treaters
  - Electrostatic treaters
- New technology in separation
- Exercise on oil and gas separators
- Materials selection for crude oil separators
- Standards & codes for crude oil separation
- Practical examples on crude oil separators
- Field case studies on crude oil separators
- Group exercises on crude oil separators

Day 4: Process Simulation for Improved Hydrocarbon Conditioning and Processing Plant Management

- Overview of hydrocarbon processing and conditioning
- Overview of process simulation procedures
- Key steps in carrying out process simulation
- Simulation concepts and tools
- Coping with uncertainties in process and equipment simulation

- Process synthesis in hydrocarbon processing and conditioning
- Simulation tools for hydrocarbon processing and conditioning
- Use of real-time information in closed-loop process management
- Practical examples
- Field case studies
- Group exercises

Day 5: Hydrocarbon Conditioning and Processing Plant Design

- Hydrocarbon conditioning and processing system design concepts
- Development of process flow diagram (PFD)
- Development of piping and instrumentation diagram (P & ID)
- Plant & equipment layout engineering
- Simulations techniques and methodologies for plant and equipment design and sizing
- Separator selection, design and sizing
- Pipeline system selection, design and sizing
- Hydraulic-pump system selection, design and sizing
- Control valve selection, design and sizing
- Safety valve selection, design and sizing
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 6: Equipment Design for Hydrocarbon Conditioning and Processing Plant

- Concepts of basic and mechanical design of process plant and equipment
- Introduction to codes, standards and recommended practices
- Introduction to economic balance and safety factors
- Introduction to compressors, pumps and accessories
- Introduction to heat exchangers
- Fundamentals and performance evaluation of cooling towers
- Fundamentals and performance evaluation of boilers
- Basics of power plant engineering
- Basics of water treatment plant
- Fundamentals and performance evaluation of natural gas/condensates transmission
- Fundamentals and performance evaluation of hydrocarbon dew-point conditioning and NGL recovery
- Fundamentals and performance evaluation of dehydration and glycol regeneration
- Fundamentals and performance evaluation of gas sweetening
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 7: Rotating Equipment Design and Sizing

Pumps

- Pump types, characteristics and operations
- Classification of pumps
- Specific speed and pump types
- Selection and sizing of pumps
- Pump characteristics head, capacity, power, efficiency, total system head and curves
- Centrifugal pump construction features
- Net positive suction head and cavitations
- Pipeline design and sizing
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Compressors

- Compressor types, characteristics and operations
- Classification of compressors
- Selection and sizing of compressor plant
- Selection of compressor ancillary equipment
- Compressor installation
- Main line installation
- Final service line installation
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 8: Tank Farm, Control Valve and Process Control

Tank farm

- Introduction to hydrocarbon storage and tank farms
- Types of hydrocarbon storage equipment
- Hydrocarbon storage system modeling and simulation
- Hydrocarbon storage system components and tank assembly
- Introduction to tank farm engineering analysis and design
- Introduction to tank farm operations
- Tanks types & architecture. Tank farm piping layouts
- Brittle fracture considerations and tank anchorage
- Tank fabrication & welding qualification
- Material selection & principle for storage tanks
- Tank in-service inspection & maintenance: tank repair & alteration requirements
- Tank examination & testing. Vents & other tank features. Other safety topics
- Standards & codes

- Practical examples
- Field case studies
- Group exercises

Control valve

- Introduction to control valves and fluid flow
- Types of control valves
- Valve sizing for liquid flow
- Valve sizing for gas flow and vapor flow
- Software tools for valve sizing
- Control valve installation and operations
- Actuators and positioners
- Cavitations and flashing in control valves
- Choosing valve materials of construction
- Key issues for control valve maintenance
- Principles of pressure relief valves
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Process control

- Basic control theory
- Control hardware - electric and pneumatic actuation
- Control hardware - self-acting actuation
- Control application
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 9: Heat Exchangers and Turbines

Heat exchangers

- Main types of heat exchangers and their primary components
- Specifying design requirements and design of primary exchanger components
- Heat exchanger selection
- The heat load, heat exchanger and steam load relationship
- Oversized heat exchangers
- Analysis and design of heat exchangers
- Typical inspection procedures
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Turbines

- Turbine types and applications
- Major components of a turbine
- Analysis and design of turbines
- Turbine construction and installation
- Governor
- Lubrication, vibration analysis, bearing temperature
- Turbine operations and control
- Typical inspection procedures
- Standards & codes
- Practical examples, field case studies and group exercises

Day 10: Hydrocarbon Flow Metering and Assets Integrity Management Systems

Hydrocarbon flow metering systems

- Introduction to hydrocarbon flow measurements and production accounting systems
- Hydrocarbon flow metering principles
- Hydrocarbon flow metering applications
    - Custody transfer, fiscal allocation and reservoir production allocation
    - Well and production testing (well and pipeline surveillance)
    - Well testing and reserves tracking
- Hydrocarbon flow metering principles
- Overview of hydrocarbon flow metering technologies currently used in the oil and gas industry
- Design, installation and operations of hydrocarbon flow metering systems Design, installation, operations and maintenance
- Non-conventional single and multiphase flow metering systems
- Uncertainty management in hydrocarbon flow estimation
- Practical examples
- Field case studies
- Group exercises

Assets integrity management systems

- Overview of asset integrity management workflows. Data collection sources & techniques. Applying inspection data to carry out integrity assessments
- Development of equipment criticality matrix. Matching maintenance strategies to equipment operating risk
- System reliability fundamentals & assessments. Maintainability fundamentals
- System level failure rate, system level reliability function MTTF, MTTR and availability determination & predictions
- Integrity management plans for facilities: risk-based approach to maintenance, failure modes, fault trees & root cause analysis, risk-based inspection, reliability-centered maintenance
- Prevention and mitigation measures. Reporting & performance measurements
- Practical examples
- Field case studies
- Group exercises

5.9 OIL PRODUCTION AND PROCESSING FACILITIES

Course Length: 10 Days
Course Dates: June 10 - 21, 2019 (Adjustable)
Course Venue: Calgary, Alberta, Canada
Amount: US$7,500

Course Description

The ten days course provides detailed discussions and hands-on training for building integrated production and well operations performance models using commercial software applications. The training course will provide fundamental and advanced knowledge of integrated production and well operations modeling components, beginning with the static reservoir pressure, inflow performance, flow across the completion, up the tubing string, surface choke, horizontal flow lines, and into the separator. Novel workflows for thoroughly evaluating, analyzing and optimizing performance of oil and gas field/well production system components to achieve an objective rate at the different states of the well/field life (early-, mid- and later-life) will also be presented. Framework to generate production optimization opportunities at different levels, from reservoir and near wellbore remediation to lift performance improvement via the additional and optimization of artificial lift will be illustrated as well. This course is also designed to provide a complete and up-to-date overview of the concepts and techniques that govern oil processing. It also presents practical workflows for selection and specification; engineering analysis and design data; engineering analysis and design methods; construction; operations; inspection; maintenance and repairs; cost estimation of process equipment in oil processing plants using case studies to highlight the topics discussed.

The course will be supplemented by practical class project example problems, group exercises and interactive group discussion designed to consolidate and reinforce learning, and identify and offer solutions to specific problems associated with oil production and processing facilities. In addition to the core case studies built specifically to drive home the techniques and tools taught during the training sessions, other cases will be drawn from oil production and processing facilities value chain as the workshop proceeds.

Who Should Attend?

This course is designed for professional process engineers, facility engineers, operation engineers, and asset managers

What You Will Gain:

- Understanding of the planning, concept development, design, construction, installation, operation, inspection and maintenance of oil production and processing facilities
- Establishing the performance of a hydrocarbon producing well in natural and artificial flowing conditions
- Learning how to model the interactions between the reservoir deliverability and the wellbore completion. Rapid assessment of marginal and mature fields re-development potentials
- Identifying potential problems and warning signs from the well's operations behavior
- Recognizing different remedial actions to restore or improve well deliverability
- Novel methods for generating integrated asset modeling (IAM) to improve the processes of fluid flow performance forecasting and scenarios analysis
- Integrating production data into integrated asset modeling (IAM) reservoir modeling and history matching

processes

- Improving integrated asset performance management using single and multi-objective optimization methods
- Applying proper principles, procedures and techniques in the selection, design, sizing and trouble-shooting of oil production and processing facilities
- Calculating, evaluating and compiling basic process data essential for design of oil production and processing facilities
- Performing evaluations of existing oil production and processing facilities and
- equipment designs and/or retrofitting methods
- Preparing comprehensive oil production and processing facilities design specification document package
- Preparing scoping cost estimates and conducting evaluations of oil production and processing facilities and contractors' design proposals
- Maintaining and trouble-shooting oil production and processing facilities, and familiarity with most updated inspection and maintenance techniques
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with oil production and processing facilities

Training Methodology

The training course will combine lectures (30%) with workshop/work presentations (30%), interactive practical exercises and case studies (20%), supported by video material, software and general discussions (20%)

Course Contents

Day 1: Oil Production and Well Operations Modeling Fundamentals

- PVT properties modeling
- Inflow and outflow (multiphase) performance modeling
- Choke & network performance modeling
- System (nodal) analysis concepts
- Estimation of OOIP & GIP
- Facility modeling (compressor, pumps, pipelines, valves, etc)
- Integrated production model calibration and updating. Calibrated production forecasting based on well performance. Scenario, sensitivity, risk and uncertainty analysis. Liquid loading in the wellbore and near reservoir condensate dropout. Well performance analysis
- Workflows for modeling well operation problems and remedial options
- Artificial lift systems
- Optimization of well productivity
- Well Stimulation
- Intelligent and complex well architectures
- Introduction to integrated asset modeling (IAM) & optimization
- Preparation of IAM components – thermodynamic model, reservoir simulation model, completion-wellbore models, surface network models, surface process model, economic model
- Model integration and software application (automated workflow construction and configuration)
- Analyzing scenarios with the IAM. Technical and economic evaluation of alternatives
- Practical examples
- Field case studies

- Group exercises

Day 2: Petroleum Reservoir Simulation Technologies

- Introduction to petroleum modeling and simulation workflows
- Reservoir simulation and model design concepts
- Introduction: Basic Concepts and Derivations
- Numerical solution of single-phase and multi-phase flow equations
- Well models in reservoir simulation
- Implicit pressure explicit saturation (IMPES) formulation
- Black oil and compositional reservoir simulation
- Reduced order reservoir modeling
- Use of Streamline Simulation for integrated reservoir modeling
- Aquifer modeling and Uncertainty quantification
- Applications (pressure transient test simulation, horizontal well modeling, water conning and cusping, gas field simulation, oil field simulation, volatile oil reservoir simulation, stimulated well modeling, pattern waterflood, etc)
- Practical examples
- Field case studies
- Group exercises

Day 3: Reservoir and Artificial Lift System (ALS) Production Optimization

- Integrated geological model
- Petrophysical evaluation
- Numerical reservoir simulation
- Reservoir modeling, characterization, history matching and Forecasting
- History matching and production forecasting
- Single and multi-objective functions
- Production optimization elements
- Numerical Optimization Methods for Oil and Gas Reservoirs
- Applications of single and multi-objective optimization techniques to petroleum fields
- Methods for uncertainty estimation
- Applications of single and multi-objective optimization techniques to petroleum fields
- Methods for uncertainty estimation
- Field development optimization
- ALS system performance design and operations
- ALS production optimization and operations management
- Practical examples
- Field case studies
- Group exercises

Day 4: Introduction to Crude Oil Processing Facilities

- Oil, gas and condensate reservoirs
- Reservoir fluids phase behavior phenomena
- Characterization of oil, gas and condensate
- Thermodynamic modeling concepts and thermodynamic properties estimation
- Crude oil processing overview
- Needs for crude oil processing
- Concept selection for process development
- Preparation of block flow diagrams (BFDs)/process flow diagrams (PFDs)/piping and instrument diagrams (P & IDs)
- Units operations and flow sheeting; handling material and energy recycles
- Understanding interactive flow sheeting/degrees of freedom/bi-directional data propagation
- Preparation of plant & equipment Layout
- Materials selection
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 5: Crude Oil Stabilization and Separation Systems

Crude oil stabilization

- Introduction to crude oil stabilization
- Fundamentals of crude oil stabilization
- Exercise on crude oil stabilization
- Materials selection for crude oil stabilizers
- Standards & codes for crude oil stabilization
- Practical examples on crude oil stabilizers
- Field case studies on crude oil stabilizers
- Group exercises on crude oil stabilizers

Crude oil separation

- Introduction to oil and gas separation
- Fundamentals of separation
    - Types of separators
    - Two-phase separators
    - Three-phase separators
- Gas scrubbers
- Slug catchers
- Separator internals
- Separator controls
- Oil/Water separator sizing & design
- Operational problems
    - Foams
    - Paraffins

- Sand
- Emulsions
- Carryover and blow-by

· Crude oil dehydration

- Introduction to crude oil dehydration units
- Flocculation
- Coalescence
- Sedimentation
- Heat
- Chemicals
- Electricity
- Retention time
- Free-water knock out
- Heater treaters
- Electrostatic treaters

- New technology in separation
- Exercise on oil and gas separators
- Materials selection for crude oil separators
- Standards & codes for crude oil separation
- Practical examples on crude oil separators
- Field case studies on crude oil separators
- Group exercises on crude oil separators

Day 6: Process Simulation for Improved Oil Processing Facility Management

- Overview of hydrocarbon processing and conditioning
- Overview of process simulation procedures
- Key steps in carrying out process simulation
- Simulation concepts and tools
- Coping with uncertainties in process and equipment simulation
- Process synthesis in hydrocarbon processing and conditioning
- Simulation tools for hydrocarbon processing and conditioning
- Use of real-time information in closed-loop process management
- Practical examples
- Field case studies
- Group exercises

Day 7: Crude Oil Processing Plant Design

- Hydrocarbon conditioning and processing system design concepts
- Development of process flow diagram (PFD)
- Development of piping and instrumentation diagram (P & ID)
- Plant & equipment layout engineering
- Simulations techniques and methodologies for plant and equipment design and sizing
- Separator selection, design and sizing

- Pipeline system selection, design and sizing
- Hydraulic-pump system selection, design and sizing
- Control valve selection, design and sizing
- Safety valve selection, design and sizing
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 8: Equipment Design for Crude Oil Processing Plant

- Concepts of basic and mechanical design of process plant and equipment
- Introduction to codes, standards and recommended practices
- Introduction to economic balance and safety factors
- Introduction to compressors, pumps and accessories
- Introduction to heat exchangers
- Fundamentals and performance evaluation of cooling towers
- Fundamentals and performance evaluation of boilers
- Basics of power plant engineering
- Basics of water treatment plant
- Fundamentals and performance evaluation of natural gas/condensates transmission
- Fundamentals and performance evaluation of hydrocarbon dew-point conditioning and NGL recovery
- Fundamentals and performance evaluation of dehydration and glycol regeneration
- Fundamentals and performance evaluation of gas sweetening
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Day 9: Rotating Equipment Design and Sizing

Pumps

- Pump types, characteristics and operations
- Classification of pumps
- Specific speed and pump types
- Selection and sizing of pumps
- Pump characteristics head, capacity, power, efficiency, total system head and curves
- Centrifugal pump construction features
- Net positive suction head and cavitations
- Pipeline design and sizing
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Compressors

- Compressor types, characteristics and operations
- Classification of compressors
- Selection and sizing of compressor plant
- Selection of compressor ancillary equipment
- Compressor installation
- Main line installation
- Final service line installation
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Turbines

- Turbine types and applications
- Major components of a turbine
- Analysis and design of turbines
- Turbine construction and installation
- Governor
- Lubrication, vibration analysis, bearing temperature
- Turbine operations and control
- Typical inspection procedures
- Standards & codes
- Practical examples, field case studies and group exercises

Day 10: Heat Exchanger, Tank Farm, Control Valve, Process Control and Flow Metering

Heat exchangers

- Main types of heat exchangers and their primary components
- Specifying design requirements and design of primary exchanger components
- Heat exchanger selection
- The heat load, heat exchanger and steam load relationship
- Oversized heat exchangers
- Analysis and design of heat exchangers
- Typical inspection procedures
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Tank farm

- Introduction to hydrocarbon storage and tank farms
- Types of hydrocarbon storage equipment
- Hydrocarbon storage system modeling and simulation
- Hydrocarbon storage system components and tank assembly

- Introduction to tank farm engineering analysis and design
- Introduction to tank farm operations
- Tanks types & architecture. Tank farm piping layouts
- Brittle fracture considerations and tank anchorage
- Tank fabrication & welding qualification
- Material selection & principle for storage tanks
- Tank in-service inspection & maintenance: tank repair & alteration requirements
- Tank examination & testing. Vents & other tank features. Other safety topics
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Control valve

- Introduction to control valves and fluid flow
- Types of control valves
- Valve sizing for liquid flow
- Valve sizing for gas flow and vapor flow
- Software tools for valve sizing
- Control valve installation and operations
- Actuators and positioners
- Cavitations and flashing in control valves
- Choosing valve materials of construction
- Key issues for control valve maintenance
- Principles of pressure relief valves
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Process control

- Basic control theory
- Control hardware - electric and pneumatic actuation
- Control hardware - self-acting actuation
- Control application
- Standards & codes
- Practical examples
- Field case studies
- Group exercises

Hydrocarbon flow metering systems

- Introduction to hydrocarbon flow measurements and production accounting systems
- Hydrocarbon flow metering principles
- Hydrocarbon flow metering applications
    - Custody transfer, fiscal allocation and reservoir production allocation

    - well and production testing (well and pipeline surveillance)
    - Well testing and reserves tracking
- Hydrocarbon flow metering principles
- Overview of hydrocarbon flow metering technologies currently used in the oil and gas industry
- Design, installation and operations of hydrocarbon flow metering systems Design, installation, operations and maintenance
- Non-conventional single and multiphase flow metering systems
- Uncertainty management in hydrocarbon flow estimation
- Practical examples
- Field case studies
- Group exercises

6. RENEWABLE ENERGY & BIO-ENERGY TECHNOLOGIES COURSES

6.1 FUNDAMENTALS OF RENEWABLE ENERGY TECHNOLOGIES

Course Length: 5 Days
Course Dates: April 29 - May 3, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
The move away from coal, oil and nuclear power to renewable forms of energy is gaining momentum. Today, technology has evolved to a point where solar energy, wind energy, biomass energy, waste to energy conversion systems, hydropower, geothermal energy, hydrogen fuel cells, hybrid renewable energy systems and energy storage can be exploited as environmentally friendly energy sources. In order to sustain this trend, the search is on to find and train well-qualified technical staff worldwide. This course offers an advanced introduction to the principles and characteristics of renewable energy systems. The course also provides planning, design, engineering, construction, operation and performance evaluation tools for various types of renewable power generation plants. The course also features practical examples and detailed case studies to illustrate the concepts presented in the training course.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers and senior managers.

What You Will Gain:
- Recognising and demonstrating a comprehensive understanding of the fundamentals and laws governing energy conversion
- Advanced skills and know-how in the latest renewable energy technologies for renewable energy professionals. Credibility as an advanced practitioner in renewable energy technologies
- The knowledge and skills to be actively involved in the planning, operation, implementation and evaluation stages of a range of renewable power generation systems
- Identifying the appropriate systems and undertake design, sizing and economic analyses
- Using case studies & interactive work/group discussion to apply the skills and knowledge acquired during the training course

Course Outline:
- World electricity demand and generation. Basic energy conversion concepts. Steam, gas turbine, combined-cycle power plants. Diesel- & gas-engine power plants. Combined heat & power systems
- Introduction to renewable energy and overview of renewable energy systems
- Optimizing selection of appropriate renewable power generation systems
- Design, operation and optimization of solar and wind energy technologies
- Design, operation and optimization of geothermal, hydro, tidal, wave ocean energy technologies
- Design, operation and optimization of hybrid gas-wind-solar power generation systems
- Case studies and group exercises on renewable energy systems

6.2 PROCESS SIMULATIONS OF LARGE-SCALE BIOMASS POWER PLANT

Course Length: 5 Days
Course Dates: May 6 – 10, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
The course presents new methods and applications to create competitive designs for both current and future large-scale biomass power plant process and equipment needs that is capable of operating in challenging situations. The course will further provide practical deterministic and probabilistic simulation modeling and optimization workflow for key management decisions during diverse biomass conversion to bio-energy operating conditions. Case studies on the applications of deterministic and probabilistic based simulation techniques to process and equipment designs in large-scale biomass power plant are also illustrated. The course also features practical examples to illustrate the concepts presented in the training course.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers, process engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Understanding of practical & commercial application of various technologies for biomass conversion into bio-energy
- Basic knowledge and fundamentals of available commercial simulation tools for planning, process and equipment designing, operating and optimizing biomass power plant projects
- Understanding the use of stochastic -based simulation tools for biomass power plant process and equipment design. Improving basic concepts in biomass power plant process economics and risk assessments. Applying uncertainties in biomass power plant process and equipment design
- Developing biomass power plant simulation model workflow for FEED studies
- How to perform troubleshooting and/or de-bottlenecking of existing biomass power plant facilities to optimize operations

Course Outline:
- Overview of biomass conversion to bio-energy. Overview of process simulation & synthesis procedures. Simulation concepts and tools. Key steps in carrying out process simulation.
- Biomass gasification and power plant process flow sheet. Process simulations of biomass gasification and power plant. Process evaluation - thermodynamic and economic performance indicators
- Coping with uncertainties in biomass power plants process and equipment simulation
- Biomass power plant equipment selection, design, fabrication, installation and commissioning
- Economic analysis
- Case studies and group exercises

6.3 ELECTRICAL POWER GENERATION FROM CO-PRODUCED WATER OF OIL AND GAS RESERVOIRS

Course Length: 5 Days
Course Dates: May 13 – 17, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Electricity power generation from oil and gas coproduced fluids using binary-cycle power generators or plants has been in multiple locations in the world. The course presents design and construction methodology of a modified waste-heat-to-power generator using produced water to create emission free electricity which can be used on site or for transmission off-site for field operations. The course provides four steps for demonstrating feasibility and profitability of electrical power generation from co-produced water of oil and gas reservoirs - building simulation model, forecasting reservoir and production conditions over the lifetime of the co-produced project, converting the predicted produced fluid flow rate and temperature by the model to electricity output, performing economic analysis of the co-produced projects. The process of designing and constructing waste to power generator is also illustrated. The course also features practical examples and case studies to illustrate the concepts presented in the training course.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers, process engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Basic knowledge and fundamentals of Organic Rankine Cycle (ORC) power process
- Basic knowledge and fundamentals of available commercial simulation tools for planning, operating and optimizing co-produced-water based electrical power generation plant projects
- Understanding the process of Co-produced-water based electrical power plant equipment selection, design, fabrication, installation and commissioning
- Using interactive work/group discussion to apply the skills acquired during the training course

Course Outline:
- Overview of current co-production projects
- Production performance modeling and simulation of petroleum reservoir -wellbore systems
- Overview of binary power plants and Organic Rankine Cycle (ORC) power process. Co-produced-water based electrical power generation plant process flow sheet. Process simulations of produced-water power plant. Process evaluation. Economic analysis. Coping with uncertainties
- Co-produced-water based electrical power plant equipment selection, design, fabrication, installation and commissioning
- Case studies and group exercises

6.4 RENEWABLE ENERGY SOURCES & THE SMART GRID TECHNOLOGIES

Course Length: 5 Days
Course Dates: May 20 – 24, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Much has been written proclaiming smart grid technology and renewable energy as the way of the future. This course examines electricity production from various forms of renewable energy, and provides a survey of the function, operation and vision of the smart grid within the entire electricity delivery system, including generation, transmission, distribution and electrical equipment manufacturing. The course also presents tools and techniques to build, operate and maintain a modern electricity system, integrating renewable energy sources, and environmental issues. The process of designing and constructing smart grids is also illustrated. The course also features practical examples and case studies to illustrate the concepts presented in the training course.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers, process engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Understanding what smart grid is and its benefits
- Advancing knowledge about smart grid concepts and technologies
- Understanding smart grid architecture and implementation
- Understanding how renewable energies can be integrated more seamlessly using smart grid technologies. Optimizing smart grid technology selection and decision-making process
- Get an overall picture of what the smart grid of the future would be like with advanced ICT
- Using interactive work/group discussion to apply the skills acquired during the training course

Course Outline:
- Overview of smart grid technologies and grid architectures
- Electric grid modernization (smart grid). Smart grid technology components
- Implementation, standards and interoperability
- Smart grid deployment and operations
- Grid architecture and renewable energies integration
- Information and communication technologies and their adoption in the smart grid
- Connection between generation, transmission, distribution, automation, substation, automation and customer
- Smart grid equipment selection, design, fabrication, installation and commissioning
- Case studies and group exercises

6.5 BIO-ETHANOL PLANT DESIGN, CONSTRUCTION, INSTALLATION, OPERATION AND MAINTENANCE

Course Length: 5 Days
Course Dates: May 27 – 31, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Undoubtedly, ethanol derived from renewable biomass feedstocks will play a key role in reducing the world dependence on fossil fuels. This course is designed to provide a concise coverage of the principles and processes that govern design, construction, installation, operation and maintenance of bio-ethanol plants. The course also presents tools and techniques to store/grind/feed biomass; slurry with water and broth; cool and add yeast to ferment; remove water and carbon-dioxide using multiple effect evaporation and fractionation; dry ethanol first by azeotropic distillation and then with molecular sieve beds; improvement of gasoline octane number by blending gasoline with bio-ethanol. The course will be supplemented by practical and up-to-date case work designed to consolidate and reinforce learning.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, project managers, project & design engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Knowing/recognizing the characteristics and applications of different types of bio-ethanol production technologies currently implemented in bio-energy sector
- Understanding the basic concepts often applied in the analysis of bio-ethanol plant
- Utilizing fundamentals of modeling, simulation, optimization and economic factors to make informed decisions on concept selection, design and operation for bio-ethanol plants
- Learning the processes, contemporary methods and challenges involved in the fabrication, construction and installation of bio-ethanol plants
- Successfully applying industry standards and procedures in assessing risks on bio-ethanol plants
- Learning the processes involved in qualifying components for bio-ethanol plants
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-ethanol plants

Course Outline:
- General description of liquid bio-fuels and types of bio-fuels
- Bio-alcohols use as a fuel source
- Feedstocks for Bio-ethanol production
- Overview of fermentation and distillation technologies
- Overview of fermentation and distillation technologies
- Overview of P & ID and PFD

- Bio-ethanol production system using biomass - store/grind/feed biomass; slurry with water and broth; cool and add yeast to ferment; remove water and carbon-dioxide using multiple effect evaporation and fractionation; dry ethanol first by azeotropic distillation and then with molecular sieve beds
- Bio-ethanol process fundamentals
- Bio-ethanol separation technology
- Bio-ethanol process instrumentation and control
- Mechanical fundamentals for bio-ethanol process control
- Bio-ethanol process dynamics and optimization
- Waste treatment technologies for bio-ethanol plants
- Improvement of gasoline octane number by blending gasoline with bio-ethanol
- Determination of optimum blends of bioethanol-gasoline mixture
- Phase behavior of bioethanol-gasoline blends
- Analysis and design of bio-ethanol plants
- Fabrication/construction/installation considerations for bio-ethanol plants
- Operations, optimization and control of bio-ethanol plants
- Inspection and integrity assessment of in-service bio-ethanol plant components
- Life extension practices for bio-ethanol plants
- Maintenance, repairs and risk management for bio-ethanol plants
- Case studies on design, construction, installation, operation and maintenance of bio-ethanol plants
- Group exercises to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-ethanol plants

6.6 BIO-DIESEL PLANT DESIGN, CONSTRUCTION, INSTALLATION, OPERATION AND MAINTENANCE

Course Length: 5 Days
Course Dates: June 3 – 7, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Biomass-derived diesel has become a key element in the downstream petroleum industry and automotive industry's strategy to reduce operating costs and environmental impacts. This course is designed to provide a concise coverage of the principles and processes that govern design, construction, installation, operation and maintenance of bio-diesel plants. The course will be supplemented by practical and up-to-date case work designed to consolidate and reinforce learning.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, project managers, project & design engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Knowing/recognizing the characteristics and applications of different types of bio-diesel production technologies currently implemented in bio-energy sector
- Understanding the basic concepts often applied in the analysis of bio-diesel plant
- Utilizing fundamentals of modeling, simulation, optimization and economic factors to make informed decisions on concept selection, design and operation for bio-diesel plants
- Learning the processes, contemporary methods and challenges involved in the fabrication, construction and installation of bio-diesel plants
- Successfully applying industry standards and procedures in assessing risks on bio-diesel plants
- Learning the processes involved in qualifying components for bio-diesel plants
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-diesel plants

Course Outline:
- Overview of bio-diesel production system
- Feedstocks for bio-diesel production system
- Bio-diesel process fundamentals
- Bio-diesel separation technology
- Bio-diesel process instrumentation and control
- Mechanical fundamentals for bio-diesel process control
- Bio-diesel process dynamics and optimization
- Waste treatment technologies for bio-diesel plants
- Analysis and design of bio-diesel plants

- Fabrication/construction/installation considerations for bio-diesel plants
- Operations, optimization and control of bio-diesel plants
- Inspection and integrity assessment of in-service bio-diesel plant components
- Life extension practices for bio-diesel plants
- Maintenance, repairs and risk management for bio-diesel plants
- Case studies on design, construction, installation, operation and maintenance of bio-diesel plants
- Group exercises to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-diesel plants

6.7 BIO-GAS PLANT DESIGN, CONSTRUCTION, INSTALLATION, OPERATION AND MAINTENANCE

Course Length: 5 Days
Course Dates: June 10 – 14, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
The sustainable provision of bio-methane plays a key role in the future energy supply and is a promising environmentally friendly solution for waste processing. With rising number and size of biogas power plants, bio-gas power plant design, construction, installation, operation and maintenance are very vital tasks. This course is designed to provide a concise coverage of the principles and processes that govern design, construction, installation, operation and maintenance of bio-gas plants. The course will be supplemented by practical and up-to-date case work designed to consolidate and reinforce learning.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, project managers, project & design engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Knowing/recognizing the characteristics and applications of different types of bio-gas production technologies currently implemented in bio-energy sector
- Understanding the basic concepts often applied in the analysis of bio-gas plants
- Utilizing fundamentals of modeling, simulation, optimization and economic factors to make informed decisions on concept selection, design and operation for bio-gas plants
- Learning the processes, contemporary methods and challenges involved in the fabrication, construction and installation of bio-gas plants
- Successfully applying industry standards and procedures in assessing risks on bio-gas plants
- Learning the processes involved in qualifying components for bio-gas plants
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-gas plants

Course Outline:
- Overview of anaerobic digestion technologies and bio-gas utilization
- Anaerobic digestion process and bio-gas production systems
- Feedstocks for bio-gas production systems
- Bio-gas production process fundamentals
- Bio-gas separation technology
- Bio-gas production process instrumentation and control
- Mechanical fundamentals for bio-gas production process control
- Bio-gas production process dynamics and optimization

- Waste treatment technologies for bio-gas plants
- Analysis and design of bio-gas production plants
- Fabrication/construction/installation considerations for bio-gas production plants
- Operations, optimization and control of bio-gas production plants
- Inspection and integrity assessment of in-service bio-gas production plant components
- Life extension practices for bio-gas production plants
- Maintenance, repairs and risk management for bio-gas production plants
- Case studies on design, construction, installation, operation and maintenance of bio-gas production plants
- Group exercises to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-gas production plants

6.8 BIO-MASS CONVERSION TO CHEMICAL PLANT DESIGN, CONSTRUCTION, INSTALLATION, OPERATION AND MAINTENANCE

Course Length: 5 Days
Course Dates: June 17 – 21, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
The great economic and environmental incentives have motivated the development of bio-refinery as an alternative to refinery, since biomass resources can be used to produce both high-value fuels and high-value chemicals. Intensive interests have arisen to develop bio-based chemicals (furfural, glycerol and derivatives, organic acids, ketones, etc). This course is designed to provide a concise coverage of the principles and processes that govern design, construction, installation, operation and maintenance of bio-mass conversion to chemical plants. The course will be supplemented by practical and up-to-date case work designed to consolidate and reinforce learning.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, project managers, project & design engineers, facility engineers, operation engineers, and asset managers.

What You Will Gain:
- Knowing/recognizing the characteristics and applications of different types of bio-mass conversion to chemical plants technologies currently implemented in bio-energy sector
- Understanding the basic concepts often applied in the analysis of bio-mass conversion to chemical plants
- Utilizing fundamentals of modeling, simulation, optimization and economic factors to make informed decisions on concept selection, design and operation for bio-mass conversion to chemical plants
- Learning the processes, contemporary methods and challenges involved in the fabrication, construction and installation of bio-mass conversion to chemical plants
- Successfully applying industry standards and procedures in assessing risks on bio-mass conversion to chemical plants
- Learning the processes involved in qualifying components for bio-mass conversion to chemical plants
- Using case studies, group exercises and interactive group discussion to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-mass conversion to chemical plants

Course Outline:
- Overview of technologies for bio-mass conversion to chemicals
- Feedstocks for bio-mass conversion to chemical production systems
- Analysis and design of bio-mass conversion to chemical plants
- Fabrication/construction/installation considerations for bio-mass conversion to chemical production plants

- Operations, optimization and control of bio-mass conversion to chemical production plants
- Inspection and integrity assessment of in-service bio-mass conversion to chemical production plant components
- Life extension practices for bio-mass conversion to chemical production plants
- Maintenance, repairs and risk management for bio-mass conversion to chemical production plants
- Case studies on design, construction, installation, operation and maintenance of bio-mass conversion to chemical production plants
- Group exercises to identify and offer solutions to specific problems associated with design, construction, installation, operation and maintenance of bio-mass conversion to chemical production plants

6.9 ECONOMIC EVALUATION & PROJECT INVESTMENT DECISION MAKING FOR RENEWABLE ENERGY & BIO-ENERGY TECHNOLOGIES

Course Length: 5 Days
Course Dates: June 24 – 28, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Sound renewable energy and bio-energy project decisions require a comprehensive analysis of project costs, benefits, risks and other factors that may affect potentially affect project outcomes. This course reviews the limits of the traditional "levelized cost" approach to properly take into account risks and uncertainties when valuing different petroleum project investments. It introduces a deterministic and probabilistic valuation model of renewable energy and bio-energy investment projects and their applications for evaluating investment situations. It will discuss objective, systematic and practical methods to deal with decision-making under uncertainty. Case studies will be provided to illustrate the field applications.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers and senior managers.

What You Will Gain:
- Knowledge of tools and processes for evaluating projects and prioritizing investments decisions
- How to help a project developer evaluate the economic impact of his project, which accelerate ability to procure financing for the project. How to help several investment groups determine economics of new asset and value of existing assets. Provide investors with a much richer analytical and probabilistic framework to assess upstream petroleum investments. Learn how to define the potential alternatives to a problem or opportunity. How to identify the key drivers affecting our decisions and assess competing alternatives to maximize value in our decisions
- Discuss methodologies of analyzing the combined impact of multiple uncertainties on the value of alternative technologies, the value of the operating flexibility & the value of different renewable energy & bio-energy investment technologies that present complementary risk-return profiles

Course Outline:
- Overview of accounting basics, cost accounting, ratio analysis, investment decisions & profitability. Renewable energy and bio-energy project economics, risk and fiscal analysis. Net cash flow
- Economic life and reserves. Distinction between cash flow and profit. Cash flow and tax. Cash flow & fiscal regimes. Incorporating inflation into cash flow projections. Real and nominal cash flows. Depreciation. Economic indicators and example economic evaluations using deterministic and probabilistic methods. Cash flow and risk analysis concepts. Time value of money
- Basics of decision analysis & investment decisions. Developing decision polices. Decision making process. Investment proposal ranking methods. Capital Management. Decision under uncertainty & risk. Risks and uncertainties in economic evaluation. Field case studies

6.10 RENEWABLE ENERGY & BIO-ENERGY PROJECT FINANCING

Course Length: 5 Days
Course Dates: July 1 – 5, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
Capital projects can be too immense for a single company to finance on their own. Many of the renewable energy and bio-energy projects fall into this category. The risk profile attached to large-scale Renewable energy and bio-energy projects is such that no single company may wish to take full exposure. In an increasingly cost-focused climate, economics of scale that are critical to success and partnering may help to achieve this. This course provides an overview of financing options for renewable energy and bio-energy projects with a focus on the pros and cons as well as key concepts and requirements. The course will highlight critical issues relating to tax, financing, corporate governance and investment protection. Case studies will be provided to illustrate the field applications.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers and senior managers.

What You Will Gain:
- Understanding the basic financial metrics such as IRR, NPV, DSCR and LCOE
- Understanding the economic justification and impact of renewable energy and bio-energy projects
- Understanding of which sustainability drives have an effect on the renewable energy and bio-energy business
- Understanding what barriers exist to renewable energy and bio-energy project implementation from a financial perspective
- Understanding what opportunities exist to facilitate renewable energy and bio-energy implementation

Course Outline:
- General introduction and overview
- Basic technical renewable energy and bio-energy technical calculations
- Project finance structure and source of capitals
- Introduction to renewable energy and bio-energy finance process fundamentals
- Renewable energy and bio-energy project finance model and calculations
- Renewable energy and bio-energy project risks and mitigants
- Legal framework and contract types for renewable energy and bio-energy projects
- Renewable energy and bio-energy project finance examples
- Field case studies

6.11 PROJECT MANAGEMENT FOR RENEWABLE ENERGY AND BIO-ENERGY TECHNOLOGIES

Course Length: 5 Days
Course Dates: July 8 – 12, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
It is common knowledge that renewable energy and bio-energy capital projects often experience major cost overruns. Key areas that frequently contribute to cost blow out are: project management, stakeholder conflicts, resource constraints, regulatory changes and unfavorable external environments. Project managers also face significant renewable energy and bio-energy technology challenges and risks, and at times a severe lack of broad based knowledge pools. This course will focus on fundamentals of renewable energy and bio-energy project designs, development and management processes. The course will also cover renewable energy best practices in design and installation; detailed feasibility report/DPR preparation; bid preparation and evaluation; O & M planning, documentation and knowledge management, etc. Case studies will be provided to illustrate the field application of the renewable energy and bio-energy project management fundamentals, methods, processes and practices.

Who Should Attend?
This course is designed for renewable energy and bio-energy technology implementing agencies, professionals, project managers, project developers, project & design engineers and senior managers.

What You Will Gain:
- Advanced skills and knowledge in the latest advanced renewable energy and bio-energy technologies for highly skilled work
- Practical know-how from practising experts with demonstrated renewable energy and bio-energy project delivery ability
- Knowledge and skills to be actively involved in planning, implementation and evaluation stages of a range of functions in specialized renewable energy and bio-energy projects
- Ability to make independent judgements and high level decisions in a variety of technical or managerial contexts

Course Outline:
- Overview of renewable energy and bio-energy technologies. Renewable energy and bio-energy plant design, engineering, procurement, construction and installation.
- The project manager's roles. Introduction to project management - Project management processes. The project environment. The project life cycles and phases. The project organizational structure. Economic evaluation and financing for a project. Cost Estimation and Budget Development. Planning and Scheduling Techniques. Project Procurement and Contract Types. Preparation of Tender Document. Bid Evaluation - Methods and Techniques. Project Performance Measurements and Earned Value Management. Project Risk Management. Case Studies

6.12 COST ESTIMATING FOR RENEWABLE ENERGY AND BIO-ENERGY PROJECTS USING COMMERCIAL SOFTWARE

Course Length: 5 Days
Course Dates: July 15 – 19, 2019 (Adjustable)
Course Venue: Dubai, UAE
Amount: US$4,900

Course Description:
This course will highlight how to obtain detailed renewable energy and bio-energy project cost estimates from minimal input fraction of the time required by traditional methods. It presents fundamental principles of simulation tools which are available in the market and present the use of consistent methodology to reduce estimation variability. The course also covers the use of commercial cost estimator to evaluate renewable energy and bio-energy projects and maximize return on investments. Case studies will be provided to illustrate the field applications and how to make adjustments to renewable energy and bio-energy project estimates based on local area conditions and reduce potential decision-making risks.

Who Should Attend?
This course is designed for project investors/owners, project directors, project managers, project engineers, cost estimators, cost controllers, planners, project accountants, project risk managers, financial analysts.

What You Will Gain:
- Understand how to build, interpret and revise estimates in fraction of the time required by traditional methods
- Learn to use commercial cost estimator to perform detailed cost estimates, perform cost tracking, evaluate petroleum capital projects and maximize return on investments
- Capability to generate consistent and reliable cost estimates in all phases of project lifecycle
- Learn to make adjustments to project estimates according local area conditions and reduce potential decision making risks
- Learn to use system documentation to promote consistent cost estimating methodologies and reduce estimation variability

Course Outline:
- Overview of renewable energy and bio-energy project cost estimating fundamentals. Description of activity-based costing methodology
- Familiarization with commercial cost estimator software graphical user interface
- Elements of cost estimating model structure & modeling cost using commercial cost estimation software. Introduction to workflows for creating and building detailed project cost models
- Best practices to build a project cost estimates and the key elements for successful estimates
- Hands-on workshops to provide participants with many opportunities to use commercial cost estimation software and apply learned concepts to daily estimating demands. Project cost libraries
- Accurate project cost estimation and profitability management. Working with project cost model data and performing what-if analysis. Case studies. Reflection & overall summary