PetroSkills

Petroleum eLearning Courses

For Technical Professionals

Self-paced online series and eLearning courses

www.petroskills.com/blended

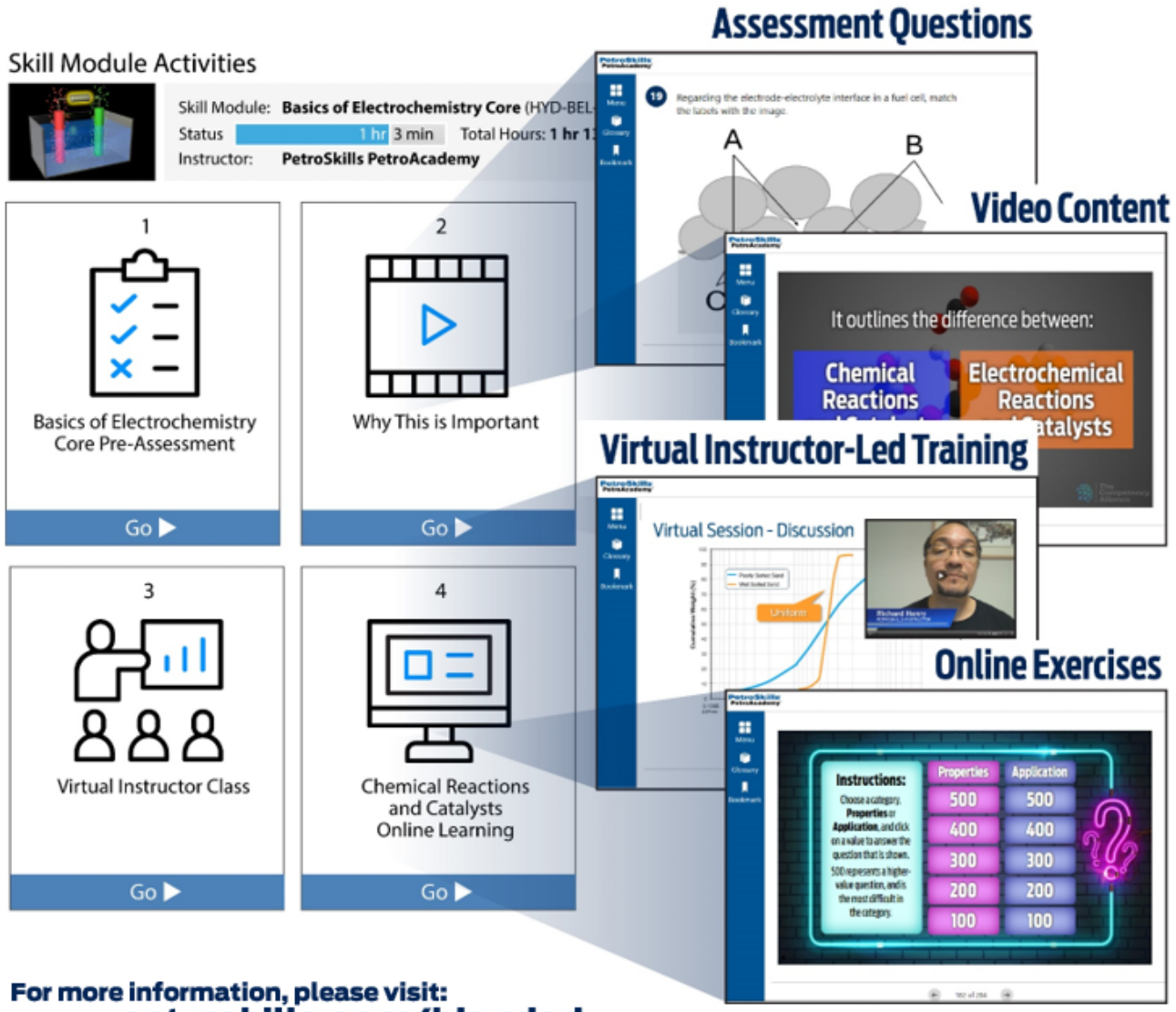
THE COMPETENCY ALLIANCE
ELEARNING SOLUTIONS

The Competency Alliance's eLearning solutions combine industry knowledge, expertise, content, and technology to develop workforce competency. Each eLearning course integrates multiple self-paced learning activities, such as reading assignments, case studies, quizzes, and experiential activities. This combination of activities increases knowledge retention.

The Competency Alliance's eLearning solutions combine industry knowledge, expertise, content, and technology to develop workforce competency with the added benefit of:

- ✓ Reduced time to competency
- ✓ Eliminated travel expenses
- ✓ Flexibility—less time away from work
- ✓ Learning applied at the point of need

eLEARNING COURSES MAY INCLUDE:



For more information, please visit:
www.petroskills.com/blended

eLearning Course Catalog

Definitions of eLearning Course Levels
Basic (Level 1) Competency Level
Foundation (Level 2) Competency Level

v.24.12 Dec-2024

eLearning Courses by Discipline

Subsurface

Introductory and Multi-Discipline

Basic (Level 1)

IAM-BHC-1	Bits and Hydraulics	Released
IAM-DWO-1	Defining Well Objectives	Released
IAM-DDC-1	Directional Drilling and Trajectory Design	Released
IAM-DSB-1	Drill String and BHA	Released
IAM-DFS-1	Drilling Fluids and Solids Control	Released
IAM-DOW-1	Drilling Operations and Well Completions	Released
IAM-EIA-1	E&P Industry and Asset Life Cycle	Released
IAM-HRC-1	Hydrocarbon Reservoirs	Released
IAM-PGC-1	Petroleum Geology	Released
IAM-POC-1	Production Operations	Released
IAM-RFP-1	Rock and Fluid Properties	Released
IAM-SSE-1	Surface/Subsurface Exploration	Released

Geology

Basic (Level 1)

GEO-FGC-1	Foundation Geological Concepts	Released
GEO-GOC-1	Basic Petroleum Geology – Introduction	Released
GEO-EXC-1	Petroleum System – Examples	Released
GEO-RFS-1	Petroleum System – Overview and Source	Released
GEO-RSC-1	Petroleum System – Reservoir and Seal	Released
GEO-TTC-1	Petroleum System – Trap and Timing	Released
GEO-PCE-1	Phases of Conventional Exploration and Development	Released
GEO-SGD-1	Sedimentary Geology – Depositional Controls for Carbonate Reservoir Rocks	Released
GEO-SGC-1	Sedimentary Geology – Depositional Controls for Clastic Reservoir Rocks	Released
GEO-GTT-1	Tools and Techniques	Released
GEO-UPR-1	Unconventional Petroleum Resources	Released
GEO-ISE-1	Interpreting Siliciclastic Environment of Deposition (EOD) for Deltaic Systems	Released
GEO-IDG-1	Introduction and Overview of Development Geology	Released
GEO-IGE-1	Introduction to Geosteering	Released
GEO-IGC-1	Introduction to Gridding for Computer-based Subsurface Mapping	Released
GEO-STI-1	Structural Interpretation Techniques and Concepts	Released

Geophysics

Basic (Level 1)

GEP-DHI-1	Direct Hydrocarbon Indicators and Amplitude versus Offset	Released

Geophysics *(continued)*

GEP-SAP-1	Seismic Acquisition, Processing, and Migration	Released
GEP-SEM-1	Seismic Mapping	Released
GEP-SIA-1	Seismic Inversion and Attributes	Released
GEP-SIG-1	Seismic Image and Geological Association with Seismic Reflections	Released
GEP-SUR-1	Seismic for Unconventional Reservoirs	Released
GEP-WSV-1	Wavelet and Seismic Velocities	Released

Foundation (Level 2)

GEP-COT-2	Compressional Tectonics Interpretation	Released
GEP-DEC-2	Depth Conversion	Released
GEP-EXB-2	Extensional Basins Interpretation	Released
GEP-GRI-2	Gravity-induced Tectonics Interpretation	Coming soon
GEP-SAT-2	Salt Tectonics Interpretation	Coming soon
GEP-SEI-2	Seismic Interpretation	Released
GEP-WRT-2	Wrench Tectonics Interpretation	Coming soon

Petrophysics

Basic (Level 1)

PPH-CIC-1	Characterization of In-situ Stresses	Released
PPH-CAC-1	Core Analysis	Released
PPH-FTC-1	Formation Testing	Released
PPH-GRS-1	Gamma Ray and Spontaneous Potential Logging	Released
PPH-IOP-1	Introduction and Overview of Petrophysics	Released
PPH-IPG-1	Introduction to Reservoir Geomechanics and its Application	Released
PPH-IUR-1	Introduction to the Petrophysical Interpretation of Unconventional Reservoirs	Released
PPH-LFM-1	Laboratory and Field Measurement of Special Rock Mechanical Properties	Released
PPH-LMB-1	Laboratory Measurements of Rock Mechanical Properties	Released
PPH-MLC-1	Mud Logging, Coring, and Cased Hole Logging Operations	Released
PPH-OPI-1	Overview of Petrophysical Interpretation	Released
PPH-PEC-1	Petrophysical Evaluation	Released
PPH-PPM-1	Pore Pressure Measurement and Prediction	Released
PPH-PLC-1	Porosity Logging (Density, Neutron and Sonic)	Released
PPH-RLT-1	Resistivity Logging Tools and Interpretation	Released
PPH-FRM-1	Rock Mechanics	Released
PPH-RMB-1	Rock Mechanics for Borehole Stability Analysis	Coming soon
PPH-RMS-1	Rock Mechanics for Shale Plays	Released
PPH-SPT-1	Special Petrophysical Tools: NRM and Image Logs	Released

Petrophysics *(continued)*

Foundation (Level 2)

PPH-BSF-2	Borehole Stability Analysis and Drilling Design Fundamentals	Coming soon
PPH-CIF-2	Characterization of In-situ Stresses Fundamentals	Released

Reservoir Engineering

Basic (Level 1)

RES-RSA-1	Decline Curve Analysis and Empirical Approaches	Released
RES-EOR-1	Enhanced Oil Recovery	Released
RES-IUR-1	Introduction to Unconventional Reservoirs	Released
RES-PTA-1	Pressure Transient Analysis	Released
RES-RTA-1	Rate Transient Analysis	Released
RES-RRC-1	Reserves and Resources	Released
RES-RFP-1	Reservoir Flow Properties	Released
RES-RFC-1	Reservoir Fluid	Released
RES-RFD-1	Reservoir Fluid Displacement	Released
RES-RMC-1	Reservoir Management	Released
RES-RMB-1	Reservoir Material Balance	Released
RES-RRP-1	Reservoir Rock Properties	Released
RES-RSI-1	Reservoir Simulation	Released
RES-RSC-1	Reservoir Surveillance	Released
RES-URA-1	Unconventional Reservoir Analysis	Released
RES-URP-1	Unconventional Reservoir Properties	Released
RES-WFO-1	Waterflood Forecasting Overview	Released
RES-WOV-1	Waterflood Overview	Released
RES-WPC-1	Waterflood Planning	Released
RES-WRO-1	Waterflood Reservoir Optimization	Released
RES-WSC-1	Waterflood Surveillance	Released
RES-WWS-1	Waterflood Water Sources	Released

Foundation (Level 2)

RES-RSA-2	Decline Curve Analysis and Empirical Approaches	Released
RES-IOR-2	Improved Oil Recovery	Released
RES-PVI-2	Producing vs. Injecting Wells	Released
RES-RFP-2	Reservoir Flow Properties	Released
RES-RFD-2	Reservoir Fluid Displacement	Released
RES-RFF-2	Reservoir Fluid	Released
RES-RMF-2	Reservoir Management	Released
RES-RMB-2	Reservoir Material Balance	Released
RES-RRP-2	Reservoir Rock Properties	Released
RES-RSF-2	Reservoir Surveillance	Released
RES-URA-2	Unconventional Reservoir Analysis	Released
RES-URP-2	Unconventional Reservoir Properties	Released
RES-WAF-2	Waterflood Analytical Forecasting	Released
RES-WRH-2	Waterflood Reservoir Heterogeneity Effects	Released
RES-WRP-2	Waterflood Reservoir Property Effects	Released

Production and Completions

Basic (Level 1)

PCE-DEC-1	Design Process for Completion and Workovers	Released
PCE-ESP-1	Electric Submersible Pumps (ESP)	Released
PCE-FAP-1	Flow Assurance and Production Chemistry	Released
PCE-FDC-1	Formation Damage and Matrix Stimulation	Released
PCE-GLC-1	Gas Lift	Released
PCE-HFC-1	Hydraulic Fracturing	Released
PCE-OCW-1	Onshore Conventional Well Completions	Released
PCE-OUW-1	Onshore Unconventional Well Completions	Released
PCE-PEC-1	Perforating	Released
PCE-PRC-1	Primary and Remedial Cementing	Released
PCE-PLC-1	Production Logging	Released
PCE-WDH-1	Production Logging Wellsite and Downhole Environment	Released
PCE-PPC-1	Production Principles	Released
PCE-PPD-1	Production Problem Diagnosis	Released
PCE-PTA-1	Production Technology Applications	Released
PCE-RPJ-1	Rod, PCP, Jet Pumps, and Plunger Lift	Released
PCE-TRP-1	The Role of Production Technology	Released
PCE-SCC-1	Sand Control	Released
PCE-WIC-1	Well Intervention	Released

Foundation (Level 2)

PCE-ANP-2	Advanced Nuclear Production Logging	Released
PCE-DEF-2	Completion Design	Released
PCE-TSE-2	Conventional Production Logging: Temperature and Single-Element Spinners	Released
PCE-TPF-2	Conventional Production Logging: Two-Phase Flow	Released
PCE-ESP-2	Electric Submersible Pumps (ESP)	Released
PCE-FDF-2	Formation Damage and Matrix Acidizing	Released
PCE-GLF-2	Gas Lift	Released
PCE-PLF-2	Production Logging	Released
PCE-PLH-2	Production Logging in High Angle/Horizontal Wells	Released
PCE-RRP-2	Reciprocating Rod Pumps	Released
PCE-SCF-2	Sand Control	Released
PCE-SPP-2	Special Purpose Production Logging	Released
PCE-WCF-2	Well Completions	Released
PCE-WPN-2	Well Performance and Nodal Analysis	Released
PCE-WOF-2	Workovers	Released

Well Construction and Drilling

Basic (Level 1)

IAM-BHC-1	Bits and Hydraulics	Released
WCD-CRO-1	Casing Running Operations	Released
WCD-CDE-1	Characterizing the Drilling Environment	Released
IAM-DWO-1	Defining Well Objectives	Released
IAM-DDC-1	Directional Drilling and Trajectory Design	Released
IAM-DSB-1	Drill String and BHA	Released
IAM-DFS-1	Drilling Fluids and Solids Control	Released
WCD-OCC-1	Oilfield Casing	Released
WCD-SPP-1	Stuck Pipe Prevention	Released
WCD-WCS-1	Well Construction Supply Chain Management	Released
WCD-WPM-1	Well Performance Management	Released
WCD-WSM-1	Well Site Management Part 1 – Logistics, Communication, and Safety	Released
WCD-WS2-1	Well Site Management Part 2 – Planning, Operations, and Continuous Improvement	Released

Unconventional Resources

Basic (Level 1)

GEO-UPR-1	Basic Petroleum Geology – Unconventional Petroleum Resources	Released
PCE-HFC-1	Hydraulic Fracturing	Released
PPH-IPG-1	Introduction to Reservoir Geomechanics and its Application	Released
PPH-IUR-1	Introduction to the Petrophysical Interpretation of Unconventional Reservoirs	Released
RES-IUR-1	Introduction to Unconventional Reservoirs	Released
PCE-OUW-1	Onshore Unconventional Well Completions	Released
GEP-SUR-1	Seismic for Unconventional Reservoirs	Released
RES-URA-1	Unconventional Reservoir Analysis	Released
RES-URA-2	Unconventional Reservoir Analysis	Released
RES-URP-1	Unconventional Reservoir Properties	Released
RES-URP-2	Unconventional Reservoir Properties	Released

Facilities

Gas Processing

Basic (Level 1)

GAS-CRA-1	Contaminant Removal - Acid Gas and Mercury Removal	Released
GAS-CRD-1	Contaminant Removal - Gas Dehydration	Released
GAS-FFC-1	Fluid Flow	Released
GAS-HTE-1	Heat Transfer Equipment	Released
GAS-HCP-1	Hydrocarbon Components and Physical Properties	Released
GAS-IGC-1	Introduction to Production and Gas Processing Facilities	Released
GAS-PCC-1	Pumps and Compressors	Released
GAS-QPB-1	Qualitative Phase Behavior and Vapor-Liquid Equilibrium	Released
GAS-RNG-1	Refrigeration, NGL Extraction and Fractionation	Released
GAS-SEC-1	Separation	Released
GAS-TAE-1	Thermodynamics and Application of Energy Balances	Released
GAS-WHP-1	Water Hydrocarbon Phase Behavior	Released

Process Facilities

Basic (Level 1)

PRS-CBH-1	Combustion Behavior of Hydrocarbons	Released
PRS-FPS-1	Fire Protection Systems	Released
PRS-GOW-1	Gas, Oil, and Water Composition and Properties	Released
PRS-HID-1	Historical Incident Databases, Plant Layout, and Equipment Spacing	Released
PRS-LDH-1	Leakage and Dispersion of Hydrocarbons	Released
PRS-REF-1	Overview of Reservoir Engineering for Facilities Operations	Released
PRS-PHA-1	Process Hazards Analysis and Layers of Protection Analysis Techniques	Released
PRS-PSR-1	Process Safety Risk Analysis and Inherently Safer Design	Released
PRS-RFS-1	Relief and Flare Systems	Released
PRS-SIS-1	SIS, Monitoring and Control	Released
PRS-SIH-1	Sources of Ignition and Hazardous Area Classification	Released
PRS-SPS-1	Specific Plant Systems and Equipment	Released

Foundation (Level 2)

PRS-CSI-2	Controls and Safety Instrumented Systems	Released
PRS-FLA-2	Flow Assurance for Surface Facilities	Released
PRS-GLS-2	Gas-liquid Separation	Released
PRS-HID-2	HID and Metrics, Bad Actors (Specific Systems)	Released
PRS-LDC-2	Leakage and Dispersion, Combustion Behavior, Sources of Ignition	Released
PRS-OGS-2	Oil Gathering Systems	Released
PRS-OSV-2	Oil Stabilization, Sweetening, Storage, and VRU Crude	Released
PRS-OTR-2	Oil Treating and Desalting	Released
PRS-OWS-2	Oil-Water Separation	Released

Process Facilities *(continued)*

PRS-OSG-2	Overview of Solution Gas Handling	Released
PRS-PHA-2	PHA Techniques and LOPA	Released
PRS-PWT-2	Produced Water Treatment	Released
PRS-RFD-2	Relief, Flare, and Depressurization	Released
PRS-RAI-2	Risk Analysis and Inherently Safer Design	Released
PRS-SLF-2	Spacing and Layout, Fire Protection	Released
PRS-TCO-2	Transportation of Crude Oil	Released
PRS-WIS-2	Water Injection	Released

Mechanical Engineering

Basic (Level 1)

MEC-CCC-1	Corrosion Control and Protection	Released
MEC-FHB-1	Fired Heaters and Boilers	Released
MEC-GST-1	Gas and Steam Turbines	Released
MEC-MDM-1	Machinery Design, Materials, and Subsystems	Released
MEC-MEC-1	Mechanical Equipment	Released
MEC-MEI-1	Mechanical Equipment Inspection, Operation and Maintenance	Released
MEC-PSW-1	Piping Systems and Welding	Released
MEC-PMC-1	Properties of Materials	Released
MEC-REC-1	Reciprocating Engines for Process Facilities	Released
MEC-STC-1	Storage Tanks	Released
MEC-UPV-1	Unfired Pressure Vessels	Released

Instrumentation & Controls

Basic (Level 1)

INC-CS1-1	Control Systems for Oil and Gas Applications (Part 1)	Released
INC-CS2-1	Control Systems for Oil and Gas Applications (Part 2)	Released
INC-CVO-1	Control Valves for Oil and Gas Applications	Released
INC-ISA-1	Instrumentation Selection for Oil and Gas Applications (Analysis)	Released
INC-ISF-1	Instrumentation Selection for Oil and Gas Applications (Flow)	Released
INC-ISO-1	Instrumentation Selection for Oil and Gas Applications (General)	Released
INC-ISL-1	Instrumentation Selection for Oil and Gas Applications (Level)	Released
INC-ISP-1	Instrumentation Selection for Oil and Gas Applications (Pressure, Temp)	Released

Electrical Engineering

Basic (Level 1)

ELE-DIV-1	Division-based Equipment Selection and Installation in Oil and Gas Facilities	Released
ELE-MOT-1	Electric Motors and Motor Control in Oil and Gas	Released
ELE-SAF-1	Electrical Safety in Design for Oil and Gas Facilities	Released
ELE-HAZ-1	Hazardous Area Classification in Oil and Gas Facilities	Released

Electrical Engineering *(continued)*

ELE-EDI-1	NEC-based Electrical Design, Installation, and Safety Codes	Released
ELE-PR1-1	Principles of Power Systems in Oil and Gas Applications (Part 1)	Released
ELE-PR2-1	Principles of Power Systems in Oil and Gas Applications (Part 2)	Released
ELE-ZON-1	Zone-based Equipment Selection and Installation in Oil and Gas Facilities	Released

Pipeline Engineering

Basic (Level 1)

PIP-PIC-1	Pipeline Construction (U.S. Focus)	Released
PIP-PHF-1	Pipeline Hydraulics and Flow Assurance	Released
PIP-POM-1	Pipeline O&M, Leak Detection, Repairs, Alterations, and Abandonment (U.S. Focus)	Released
PIP-PCS-1	Pipeline Pump and Compressor Stations and Terminals (U.S. Focus)	Released
PIP-PRG-1	Pipeline Routing and Geomatics (U.S. Focus)	Released
PIP-PSS-1	Pipeline Strength, Stability, and Environmental Considerations Core (U.S. Focus)	Released

Downstream

Basic (Level 1)

REF-ELE-1	Electrical Topics for Non-Electrical Engineers	Coming soon
REF-RCO-1	Refinery Corrosion Overview	Coming soon
REF-SPC-1	Refinery Separation Processes Corrosion	Coming soon
REF-CPC-1	Refinery Conversion Processes Corrosion	Coming soon
REF-TPC-1	Refinery Treatment Process Corrosion	Coming soon
REF-RSC-1	Refinery Storage Corrosion	Coming soon
REF-SUP-1	Refining and Petrochemical Operation Supervisory Skills	Coming soon
REF-QAC-1	Refining and Petrochemicals QA/QC Laboratory Management	Coming soon
REF-RMP-1	Refining and Petrochemicals Routine Maintenance, Planning, and Control	Coming soon
REF-RPT-1	Refining and Petrochemicals Turnaround Planning and Control	Released
REF-OMS-1	Refining Oil Movement and Storage Operations	Released
REF-RCM-1	Reliability Centered Maintenance (RCM)	Coming soon

Project Management

Basic (Level 1)

PRJ-AGS-1	Acquiring Goods and Services	Released
PRJ-CMC-1	Construction Management	Released
PRJ-CEC-1	Cost Estimating for Facility Projects	Released
PRJ-DEM-1	Design Engineering Management	Released
PRJ-INT-1	Interface Management for Programs and Projects	Released
PRJ-OFD-1	Onshore Field Development Programs and Projects	Released
PRJ-PMC-1	Progress Measurement	Released
PRJ-PGC-1	Project Governance	Released
PRJ-PRO-1	Project Resources and Organization	Released
PRJ-RMC-1	Project Risk Management	Released
PRJ-SCC-1	Scheduling	Released
PRJ-SDC-1	Scope Delivery	Released

Business and Management

Basic (Level 1)

PEB-BUC-1	Budgeting	Released
PEB-CFC-1	Cash Flow	Released
PEB-DAP-1	Decision Analysis Process	Released
PEB-EDT-1	Economic Decision Tools	Released
PEB-FOC-1	Financing and Ownership	Released
PEB-OGP-1	Oil and Gas Pricing	Released
PEB-PIA-1	Petroleum Industry Accounting	Released
PEB-PFC-1	Production Forecasting	Released
PEB-RUC-1	Risk and Uncertainty	Released

Foundation (Level 2)

PEB-DPV-2	Decision Policy and Value Calculations	Released
PEB-JBC-2	Judgments and Biases	Released
PEB-DIS-2	Monte Carlo Simulation and Distributions	Released
PEB-VCC-2	Value of Control	Released
PEB-BRC-2	Value of Information and Bayes' Rule	Released

Data Science and Analytics

Basic (Level 1)

DSA-DFD-1	Data Foundation for the Digital Oilfield	Released
DSA-DOC-1	Digital Oilfield Challenges, Barriers to Adoption, and Risks	Released
DSA-IDW-1	Introduction to Data-driven Workflows	Released
DSA-IDO-1	Introduction to the Digital Oilfield	Released
DSA-OTF-1	Operational Technology and Field Networks	Released
DSA-SML-1	Supervised Machine Learning	Released
DSA-FDO-1	The Future of the Digital Oilfield	Released
DSA-UML-1	Unsupervised Machine Learning and Clustering	Released

Introductory and Multi-Discipline

Overview of the Petroleum Industry

ABOUT THIS SERIES

This series provides the participant with an understanding of basic petroleum technology in the context of the Petroleum Value Chain, from exploration to abandonment. The participant will understand how and when geoscience and engineering professionals use technology to determine and optimize the economic value of an oil and gas field. This enables the participant to maximize their professional and administrative contribution to their organization.

Candidates can take the following self-paced eLearning courses individually or as a **21-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
E&P Industry and Asset Life Cycle	Level 1	4 hrs
Petroleum Geology	Level 1	2.5 hrs
Hydrocarbon Reservoirs	Level 1	2.5 hrs
Rock and Fluid Properties	Level 1	3.5 hrs
Surface/Subsurface Exploration	Level 1	3.5 hrs
Drilling Operations and Well Completions	Level 1	3.5 hrs
Production Operations	Level 1	2 hrs

DESIGNED FOR

Those who need to achieve a context and understanding of E&P technologies in conventional and unconventional fields, the role of technical departments in oil and gas operations and understand and use the language of the oilfield.

LEVEL: Basic (Level 1)

Geology

Basic Petroleum Geology

ABOUT THIS SERIES

This series is designed to introduce anyone to the basic concepts of petroleum geology. An important goal of the series is to explain the vocabulary and context of petroleum geology so that participants can learn and understand the role of the geologist in the overall process of petroleum exploration and production for both conventional and unconventional resources. The series is supplemented by many case histories and examples that concretely illustrate the concepts and principles presented in the material.

Candidates can take the following self-paced eLearning courses individually or as a **48-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Basic Petroleum Geology – Introduction	Level 1	5 hrs
Foundation Geological Concepts	Level 1	5 hrs
Sedimentary Petroleum Geology – Depositional Controls for Clastic Reservoir Rocks	Level 1	5 hrs
Sedimentary Geology – Depositional Controls for Carbonate Reservoir Rocks	Level 1	3.5 hrs
Petroleum System – Overview and Source	Level 1	4 hrs
Petroleum System – Reservoir and Seal	Level 1	4 hrs
Petroleum System – Trap and Timing	Level 1	5 hrs
Petroleum System – Examples	Level 1	3 hrs
Phases of Conventional Exploration and Development	Level 1	4 hrs
Tools and Techniques	Level 1	5.5 hrs
Unconventional Petroleum Resources	Level 1	3.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

Geophysics

Basic Geophysics

ABOUT THIS SERIES

This series is designed to familiarize anyone using seismic data with the nature of the data and what they specifically represent. One key goal is to explain the confusing amount of jargon used by the geophysical community when using seismic data. The series is supplemented by many case histories that concretely illustrate the principles in the material. These are updated frequently to keep up with the rapidly developing technology in this field.

Candidates can take the following self-paced eLearning courses individually or as a **26-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Seismic Image and Geological Association with Seismic Reflections	Level 1	4.5 hrs
Wavelets and Seismic Velocities	Level 1	3 hrs
Seismic Acquisition, Processing, and Migration	Level 1	5.5 hrs
Seismic Mapping	Level 1	4 hrs
Direct Hydrocarbon Indicators and Amplitude versus Offset	Level 1	4.5 hrs
Seismic Inversion and Attributes	Level 1	3 hrs
Seismic for Unconventional Reservoirs	Level 1	1.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

COMING SOON

Seismic Interpretation

ABOUT THIS SERIES

You can answer these and related questions by understanding the seismic system, its limitations and pitfalls, and by interpreting 2D and 3D seismic examples of structural and stratigraphic features associated with actively producing hydrocarbon areas.

- Can I observe the reservoir on seismic?
- How large is the reservoir?
- Did the well cut a fault?
- Can seismic help me tie a set of wells?
- What kind of a structural trap did I drill into?
- Is the structure valid or a seismic artifact?
- Are these reflections real or multiples?
- How can I combine structural and stratigraphic interpretations to develop a structural and depositional history?
- How does seismic data acquisition and processing impact my interpretation?
- Will my well encounter hazards such as abnormal pressure or shallow gas?

Candidates can take the following self-paced eLearning courses individually or as a **~20-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Seismic Interpretation Fundamentals	Level 2	2.5 hrs
Salt Tectonics Interpretation Fundamentals	Level 2	3 hrs
Depth Conversion Fundamentals	Level 2	2 hrs
Gravity-Induced Tectonics Interpretation Fundamentals	Level 2	~ 3 hrs
Compressional Tectonics Interpretation Fundamentals	Level 2	1.5 hrs
Wrench Tectonics Interpretation Fundamentals	Level 2	~ 3 hrs
Extensional Basins Interpretation Fundamentals	Level 2	3.5 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Direct Hydrocarbon Indicators and Amplitude versus Offset

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data with the basics of AVOs and DHIs and how they are used in interpretation. This series combines self-paced eLearning courses, on-demand instructor-led lectures, problem assignments, problem debriefs, and real-world application examples.

It is strongly recommended that you take (1) Principles of Geophysics, (2) Seismic Acquisition, Processing, and Migration, and (3) Seismic Mapping to understand the fundamental concepts before taking this series.

YOU WILL LEARN HOW TO

- Explain the effect of hydrocarbons in the seismic data
- Detect hydrocarbons in the seismic data
- Describe rock physics
- Define amplitude variation with offset/angle (AVO/AVA)
- Make approximations to the Zoeppritz equations, including Aki-Richards equation and Shuey's equation
- Identify the Rutherford and Williams classification
- Describe slope, intercept, and the fluid line
- Describe the methods for prestack inversion, including simultaneous inversion, elastic Impedance and extended elastic impedance, lambda rho, and mu rho

DESIGNED FOR

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

Day 1			
e-Learning	Types of Direct Hydrocarbon Indicators Detecting Direct Hydrocarbon Indicators Rock Physics AVO Effects and Anomalies Prestack Inversion Amplitude versus Offset Workflow Reading	Required	3.5 hr
Day 2			
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hr
Duration:			**5.5 hr**

Principles of Geophysics

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data with the fundamentals of seismic data. One of the key goals of this series is to explain the large and confusing amount of jargon used by the geophysical community when they use seismic data.

YOU WILL LEARN HOW TO

- Identify a seismic image
- Explain how a seismic image relates to geology
- Describe how a seismic image is formed
- Identify how a seismic image is displayed
- Differentiate between time and depth
- Describe the lithology and how it relates to the seismic image
- Relate the logs to the seismic data
- Identify the effect of pore filling material on velocity and density
- Identify why the vertical resolution of the seismic data is a critical issue
- Explain how the resolution is controlled by the propagating wavelet that is generated by the acquisition parameters
- Identify the recorded wavelet and its phase
- Describe the data display polarity and display conventions
- The velocity family, the relationship between depth and time
- Well velocities
- Vertical seismic profiles (VSPs)
- Overpressure and seismic velocities

DESIGNED FOR

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

Day 1			
e-Learning	Seismic Displays in Time and Depth Lecture Reflections Stacked Traces Rays and Waves 3D Data Cube Exercise	Required	3 hr
Day 2			
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hrs
Day 3			
e-Learning	The Effects of Lithology Relating the Logs to the Seismic Data The Effect of Pore Filling Material on Velocity and Density Wavelet in the Seismic Data and Limits on Resolution Seismic Velocities Geophysical Fundamentals reading Seismic Velocities	Required	6.5 hr
e-Learning	Overview of Seismic Attributes and Lateral Changes in Amplitude and Pattern Recognition Articles	Optional	(.3 hr)
Day 4			
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hrs
Duration:			13.5 hr

Seismic Acquisition, Processing, and Migration

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data with how seismic data is acquired, processed, and migrated to form a section that can be used by an interpreter.

This series is a blend of self-paced eLearning courses, on-demand instructor-led lectures, problem assignments, problem debriefs with real-world application examples and knowledge sharing.

YOU WILL LEARN HOW TO

- Describe the marine configuration for a 3D survey including:
  - Components used for data acquisition
  - Arrays to attenuate noise
  - Bin gathering as a CMP assemblage of reflections
- Describe the land configuration for a 3D survey including:
- Bin gathering for a land 3D survey
- Compare the costs of 2D and 3D surveys
- Describe processing flow
- Explain the concept of deconvolution
- Identify what the processors do to produce the seismic image
- Identify a seismic image

DESIGNED FOR

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

Day 1			
e-Learning	Marine Data Acquisition Land Data Acquisition Acquisition and Processing Fold (Trace Density) Exercise Seismic Velocities Overview of Seismic Data Processing Producing the Seismic Image	Required	4 hr
ay 2			
e-Learning	Seismic Mapping Velocity Analysis Reading Acquisition Reading QC for Seismic Processing Seismic Processing Basics Reading Introduction to Migration Reading	Required	1.5 hr
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hr
Duration:			7.5 hr

Seismic Inversion and Attributes

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data with the principles of Inversion and attributes and how they are used in an interpretation. One of the key goals of the course is to explain the large and confusing amount of jargon that is used by the geophysical community when they use seismic data.

This series is a blend of self-paced eLearning courses, on-demand instructor-led lectures, problem assignments, problem debriefs with real-world application examples and knowledge sharing.

It is strongly recommended that you take (1) Principles of Geophysics, (2) Seismic Acquisition, Processing, and Migration, and (3) Seismic Mapping to understand the fundamental concepts before taking this series.

YOU WILL LEARN HOW TO

- Explain the seismic inversion processes, both forward and inverse
- Identify relative and absolute impedance in seismic inversion
- Identify the inversion algorithms and their application

DESIGNED FOR

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

Day 1			
e-Learning	Seismic Inversion Relative and Absolute Impedance in Seismic Inversion Inversion Algorithms Attributes Spectral Decomposition and Spectral Notching Attenuation, Q, and Hilbert Transform Multi-Trace Attributes Self-Organizing Maps Additional Considerations for Attributes	Required	2.5 hr
Day 2			
e-Learning	1. Seismic Attributes for Prospect Identification and Reservoir Characterization 2. Prestack Geometric Attributes Reading 3. Log Input for Rock Physics Reading 4. Seismic Inversion Additional Reading 5. Acoustic Impedance Inversion Reading 6. Attributes Workflow Reading 7. Spectral Decomposition and Wavelet Transforms Article 8. Seismic Processing Basics Reading	Optional	(2.5 hr)
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hr
Duration:			7 hr

Seismic Mapping

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data in the principles of how to map an interpretation made from seismic data.

This series is a blend of self-paced eLearning courses, on-demand instructor-led lectures, problem assignments, problem debriefs with real-world application examples and knowledge sharing.

YOU WILL LEARN HOW TO

- Identify the layout of a 3D seismic survey
- Turn the interpretation into a data reduction process resulting in an interpretation and a structural map originally in time

DESIGNED FOR

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

Day 1			
Virtual Instructor-Led	Virtual Instructor-Class	Required	1 hr
e-Learning	Seismic Mapping Interpretation Exercise	Required	3 hr
Day 2			
e-Learning	Seismic Attributes for Prospect Identification and Reservoir Characterization Articles	Optional	(.5 hr)
Virtual Instructor-Led	Instructor Debrief/Problems	Required	(3 hr)
Duration:			7.5 hr

Seismic for Unconventional Reservoirs

ABOUT THIS SERIES

This eLearning series is designed to familiarize anyone using seismic data with how seismic data is used to explore and develop unconventional reservoirs. One key goal of this series is to explain the large and confusing amount of jargon used by the geophysical community when using seismic data.

This series combines self-paced eLearning courses, on-demand instructor-led lectures, problem assignments, problem debriefs, and real-world application examples.

It is strongly recommended that you take (1) Principles of Geophysics, (2) Seismic Acquisition, Processing, and Migration, and (3) Seismic Mapping to understand the fundamental concepts before taking this series.

YOU WILL LEARN HOW TO

- Identify rock physics for shale reservoirs
- Describe seismic analysis for unconventional reservoirs
- Describe microseismic, including surface and subsurface recording arrays
- Describe source (event) recording and location detection
- Describe three component recording
- Identify the role of Hodograms in source orientation
- Identify the importance of microseismic monitoring in different stress areas

DESIGNED FOR

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

Day 1			
e-Learning	Seismic Unconventional Reservoirs Unconventional Rock Physics Microseismic Recording and Monitoring	Required	1.25 hr
Day 2			
Virtual Instructor-Led	Instructor Debrief/Problems	Required	2 hrs
Duration:			3.5 hr

Petrophysics

Foundations of Petrophysics

ABOUT THIS SERIES

Petrophysics is fundamental to all aspects of the petroleum business. Principles, applications, and integration of petrophysical information for reservoir description will be discussed in depth. Through a series of online learning activities, participants will learn how to conduct competent quick-look evaluations. Using data from open hole logs, logging-while-drilling, and core data you will evaluate porosity, permeability, and saturation in a variety of reservoirs. Knowing how to integrate petrophysical information with other data sources will improve participants' ability to assess technical risk when examining hydrocarbon opportunities.

Candidates can take the following self-paced eLearning courses individually or as a **36-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction and Overview of Petrophysics	Level 1	5 hrs
Mud Logging, Coring, and Cased Hole Logging Operations	Level 1	4.5 hrs
Porosity Logging	Level 1	5.5 hrs
Gamma Ray and Spontaneous Potential Logging	Level 1	3 hrs
Formation Testing	Level 1	4.5 hrs
Resistivity Logging Tools and Interpretation	Level 1	3.5 hrs
Petrophysical Evaluation	Level 1	4 hrs
Core Analysis	Level 1	3 hrs
Special Petrophysical Tools: NMR and Image Logs	Level 1	2.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

COMING SOON

Introduction to Geomechanics for Unconventional Reservoirs

ABOUT THIS SERIES

This series provides an overview of petroleum geomechanics and its applications for development of unconventional plays. It is presented in three sections: (i) fundamentals of petroleum geomechanics, (ii) geomechanical characterization, stress modeling, and building mechanical earth models, and (iii) geomechanical modeling for unconventional plays. Several exercises and case studies will help the participants to gain a profound understanding of the presented materials.

Candidates can take the following self-paced eLearning courses individually or as a **~30-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to Reservoir Geomechanics and its Application	Level 1	4 hrs
Rock Mechanics	Level 1	4 hrs
Pore Pressure Measurement and Prediction	Level 1	4 hrs
Laboratory Measurements of Rock Mechanical Properties	Level 1	2.5 hrs
Laboratory and Field Measurement of Special Rock Mechanical Properties	Level 1	3 hrs
Rock Mechanics for Shale Plays	Level 1	4.5 hrs
Characterization of In-Situ Stresses	Level 1	4 hrs
Characterization of In-Situ Stresses Fundamentals	Level 2	5 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

COMING SOON

Introduction to Borehole Stability Analysis for Drilling

ABOUT THIS SERIES

This series provides a practical review of borehole stability analysis for well planning, a crucial part of field development. The series covers geomechanical concepts for borehole stability analysis from data collection and building mechanical earth models to modeling and determining safe mud window and optimum well trajectory for drilling vertical, deviated, and horizontal wells. Several exercises and case studies will help the participants to gain a profound understanding of the presented materials.

Candidates can take the following self-paced eLearning courses individually or as a **~34-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to Reservoir Geomechanics and its Application	Level 1	4 hrs
Rock Mechanics	Level 1	4 hrs
Pore Pressure Measurement and Prediction	Level 1	4 hrs
Laboratory Measurements of Rock Mechanical Properties	Level 1	2.5 hrs
Laboratory and Field Measurement of Special Rock Mechanical Properties	Level 1	3 hrs
Rock Mechanics for Borehole Stability Analysis – *COMING SOON*	Level 1	~4 hrs
Characterization of In-Situ Stresses	Level 1	4 hrs
Characterization of In-Situ Stresses Fundamentals	Level 2	5 hrs
Borehole Stability Analysis and Drilling Design Fundamentals – *COMING SOON*	Level 2	~4 hrs

DESIGNED FOR

Drilling and completion engineers, geoscientists, reservoir engineers, petrophysicists, and anyone involved with well planning and field development.

LEVEL: Foundation (Level 2)

Reservoir Engineering

Applied Reservoir Engineering

ABOUT THIS SERIES

This series represents the core of PetroSkills' 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.

Candidates can take the following self-paced eLearning courses individually or as a **135-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Reservoir Rock Properties	Level 1	3 hrs
Reservoir Rock Properties Fundamentals	Level 2	8 hrs
Reservoir Fluid	Level 1	4 hrs
Reservoir Fluid Fundamentals	Level 2	9.5 hrs
Reservoir Flow Properties	Level 1	3 hrs
Reservoir Flow Properties Fundamentals	Level 2	8.5 hrs
Reservoir Material Balance	Level 1	8 hrs
Reservoir Material Balance Fundamentals	Level 2	6.5 hrs
Decline Curve Analysis and Empirical Approaches	Level 1	3.5 hrs
Decline Curve Analysis and Empirical Approaches Fundamentals	Level 2	10.5 hrs
Reserves and Resources	Level 1	5.5 hrs
Pressure Transient Analysis	Level 1	3.5 hrs
Rate Transient Analysis	Level 1	4 hrs
Reservoir Fluid Displacement	Level 1	4 hrs
Reservoir Fluid Displacement Fundamentals	Level 2	10 hrs
Enhanced Oil Recovery	Level 1	4.5 hrs
Improved Oil Recovery Fundamentals	Level 2	5.5 hrs
Reservoir Surveillance	Level 1	6.5 hrs
Reservoir Surveillance Fundamentals	Level 2	9.5 hrs
Reservoir Management	Level 1	6 hrs
Reservoir Management Fundamentals	Level 2	8 hrs
Reservoir Simulation	Level 1	4 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Basic Reservoir Engineering

ABOUT THIS SERIES

This series is designed to help the participants better understand the characteristics of oil and gas reservoirs, from fluid and rock characteristics through reservoir definition, delineation, classification, development, and production. Data collection, integration, and application are stressed to maximize recovery and Net Present Value. Basic reservoir engineering equations are introduced with emphasis directed to parameter significance and an understanding of the results. For nearly 30 years, this has been one of our most popular and successful courses.

Candidates can take the following self-paced eLearning courses individually or as a **51-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Reservoir Rock Properties	Level 1	3 hrs
Reservoir Rock Properties Fundamentals	Level 2	8 hrs
Reservoir Fluid	Level 1	4 hrs
Reservoir Flow Properties	Level 1	3 hrs
Reservoir Material Balance	Level 1	8 hrs
Decline Curve Analysis and Empirical Approaches	Level 1	3.5 hrs
Reserves and Resources	Level 1	5.5 hrs
Pressure Transient Analysis	Level 1	3.5 hrs
Rate Transient Analysis	Level 1	4 hrs
Reservoir Fluid Displacement	Level 1	4 hrs
Enhanced Oil Recovery	Level 1	4.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

Waterflooding A to Z

ABOUT THIS SERIES

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

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

Candidates can take the following self-paced eLearning courses individually or as a **43-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Waterflood Overview	Level 1	5.5 hrs
Waterflood Reservoir Property Effects Fundamentals	Level 2	5.5 hrs
Waterflood Reservoir Heterogeneity Effects Fundamentals	Level 2	4.5 hrs
Waterflood Forecasting Overview	Level 1	2.5 hrs
Waterflood Analytical Forecasting Fundamentals	Level 2	6.5 hrs
Waterflood Surveillance	Level 1	3.5 hrs
Producing versus Injecting Wells Fundamentals	Level 2	5.5 hrs
Waterflood Water Sources	Level 1	2.5 hrs
Waterflood Reservoir Optimization	Level 1	2.5 hrs
Waterflood Planning	Level 1	4 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Unconventional Reservoir Geoscience and Engineering

ABOUT THIS SERIES

This series is designed for professional engineers and geoscientists with little experience in unconventional reservoirs who wish to quickly learn the key elements of these reservoirs and the technologies to exploit them. Focused on shale (tight) oil, tight gas, and coalbed methane this series begins with geoscience elements, reservoir fluid properties, and unconventional well completions. Tests and techniques such as diagnostic fracture injection tests (DFITs), diagnostic plots, and rate transient analysis (RTA) to understand individual well performance are discussed. Field-level topics include field development and reservoir surveillance. Decline curve analysis (DCA) for individual wells is presented, followed by the assignment of reserves and resources in unconventionals. Attendees will complete this series with a better understanding of the reservoirs which supply an ever-increasing fraction of the world's oil and gas, unconventional reservoirs.

Candidates can take the following self-paced eLearning courses individually or as a **39-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to Unconventional Reservoirs	Level 1	3.5 hrs
Reservoir Fluid	Level 1	4 hrs
Reservoir Rock Properties	Level 1	3 hrs
Reservoir Flow Properties	Level 1	3 hrs
Unconventional Reservoir Properties	Level 1	3.5 hrs
Unconventional Reservoir Properties Fundamentals	Level 2	6.5 hrs
Unconventional Reservoir Analysis	Level 1	2 hrs
Unconventional Reservoir Analysis Fundamentals	Level 2	9.5 hrs
Rate Transient Analysis	Level 1	4 hrs

DESIGNED FOR

Petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types.

LEVEL: Foundation (Level 2)

Well Construction and Drilling

Basic Drilling, Completions, and Workover Operations

ABOUT THIS SERIES

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

Candidates can take the following self-paced eLearning courses individually or as a **43-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Drilling Operations and Well Completions	Level 1	3.5 hrs
Defining Well Objectives	Level 1	1.5 hrs
Bits and Hydraulics	Level 1	3.5 hrs
Drill String and BHA	Level 1	3 hrs
Drilling Fluids and Solids Control	Level 1	3.5 hrs
Directional Drilling and Trajectory Design	Level 1	2.5 hrs
Oilfield Casing	Level 1	3.5 hrs
Primary and Remedial Cementing	Level 1	5 hrs
Onshore Conventional Well Completions	Level 1	4 hrs
Hydraulic Fracturing	Level 1	4 hrs
Formation Damage and Matrix Stimulation	Level 1	3 hrs
Sand Control	Level 1	3 hrs
Well Intervention	Level 1	3 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

Basic Drilling Technology

ABOUT THIS SERIES

This series provides a fundamental overview of the design, planning, and implementation of drilling an oil and gas well. It is beneficial to all interested parties, directly and indirectly, involved in the well drilling process. Administrative support and multi-discipline team members would all benefit from this overview of the basic concepts and practices. Their ability to add value to the overall process through collaboration is greatly enhanced.

Candidates can take the following self-paced eLearning courses individually or as a **48-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Defining Well Objectives	Level 1	1.5 hrs
Characterizing the Drilling Environment	Level 1	4 hrs
Directional Drilling and Trajectory Design	Level 1	2.5 hrs
Drilling Fluids and Solids Control	Level 1	3.5 hrs
Oilfield Casing	Level 1	3.5 hrs
Bits and Hydraulics	Level 1	3.5 hrs
Drill String and BHA	Level 1	3 hrs
Casing Running Operations	Level 1	4 hrs
Primary and Remedial Cementing	Level 1	5 hrs
Well Performance Management	Level 1	2.5 hrs
Well Construction Supply Chain Management Core	Level 1	2.5 hrs
Well Site Management Part 1 – Logistics, Communication and Safety Core	Level 1	3 hrs
Well Site Management Part 2 – Planning, Operations and Continuous Improvement Core	Level 1	3.5 hrs
Stuck Pipe Prevention Core	Level 1	5.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

Production and Completions

Completions and Workovers

ABOUT THIS SERIES

The Completions and Workovers blended course represents one of the most popular foundation series courses within PetroSkills' production engineering curriculum. Participants will become familiar with many aspects of modern completion design and various workover technologies. This series is intended to be broad-based and include conventional and unconventional wells. The focus of this series is on design and selection.

Candidates can take the following self-paced eLearning courses individually or as a **67-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Onshore Conventional Well Completions	Level 1	4 hrs
Design Process for Completion and Workovers	Level 1	3.5 hrs
Perforating	Level 1	3.5 hrs
Onshore Unconventional Well Completions	Level 1	4 hrs
Sand Control	Level 1	3 hrs
Hydraulic Fracturing	Level 1	4 hrs
Completion Design Fundamentals	Level 2	10.5 hrs
Well Completions Fundamentals	Level 2	9.5 hrs
Formation Damage and Matrix Stimulation	Level 1	3 hrs
Flow Assurance and Production Chemistry	Level 1	5 hrs
Production Problem Diagnosis	Level 1	5 hrs
Well Intervention	Level 1	3 hrs
Workover Fundamentals	Level 2	9 hrs

DESIGNED FOR

Graduates or engineers with experience in drilling operations, production operations, workovers, and completions, as well as petroleum engineering in the service and operating sectors.

LEVEL: Foundation (Level 2)

Production Logging

ABOUT THIS SERIES

Production logging refers to acquiring a suite of logging measurements in a completed well that is either on injection or production to evaluate the flow performance of the well or the reservoir. Special-purpose production logging instruments can evaluate the well completion or look behind the pipe to evaluate the formation and its fluids in the near-wellbore vicinity. Production logs are increasingly important in modern reservoir management by providing the only means of directly identifying downhole fluid movement. This series will cover single-phase and multi-phase fluid flow in pipes, the theoretical bases of production logging techniques, production log interpretation, and operational considerations in acquiring production logs. Numerous field examples are used to illustrate the principles of production log interpretation.

Candidates can take the following self-paced eLearning courses individually or as a **51-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Production Logging Wellsite and Downhole Environment	Level 1	3 hrs
Conventional Production Logging: Temperature and Single-Element Spinners Fundamentals	Level 2	9.5 hrs
Conventional Production Logging: Two-Phase Flow Fundamentals	Level 2	9.5 hrs
Production Logging in High Angle/Horizontal Wells Fundamentals	Level 2	8 hrs
Advanced Nuclear Production Logging Fundamentals	Level 2	10 hrs
Special Purpose Production Logging Fundamentals	Level 2	11 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Production Operations I

ABOUT THIS SERIES

This series represents the foundation of PetroSkills' production engineering curriculum. Participants will become familiar with both proven historical production practices as well as current technological advances to enhance oil and gas production. Applied skills guide the participant within a framework to make careful, prudent, technical oil and gas business decisions.

Candidates can take the following self-paced eLearning courses individually or as a **99-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Production Principles	Level 1	5 hrs
Well Performance and Nodal Analysis Fundamentals	Level 2	9 hrs
Onshore Conventional Well Completions	Level 1	4 hrs
Hydraulic Fracturing	Level 1	4 hrs
Onshore Unconventional Well Completions	Level 1	4 hrs
Perforating	Level 1	3.5 hrs
Sand Control	Level 1	3 hrs
Sand Control Fundamentals	Level 2	7.5 hrs
Primary and Remedial Cementing	Level 1	5 hrs
Rod, PCP, Plunger Lift, and Jet Pump	Level 1	4.5 hrs
Reciprocating Rod Pumps Fundamentals	Level 2	8.5 hrs
Gas Lift	Level 1	1.5 hrs
Electric Submersible Pumps (ESP)	Level 1	1.5 hrs
Gas Lift Fundamentals	Level 2	6.5 hrs
Electric Submersible Pumps (ESP) Fundamentals	Level 2	6 hrs
Formation Damage and Matrix Stimulation	Level 1	3 hrs
Formation Damage and Matrix Acidizing Fundamentals	Level 2	10 hrs
Flow Assurance and Production Chemistry	Level 1	5 hrs
Production Problem Diagnosis	Level 1	5 hrs
Production Logging	Level 1	3.5 hrs
Production Logging Fundamentals	Level 2	6.5 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Production Technology for Other Disciplines

ABOUT THIS SERIES

This series introduces a broad array of important daily Production Technology practices to team members. The series covers terminology, expressions, axioms, and basic calculations regularly utilized by production techs. Emphasis is upon proven technology required to effectively develop and operate an asset in a multidiscipline development environment. Practical application of technology is emphasized. Both theory and actual field examples and well completion programs are studied along with class problems, exercises, and videos. Nodal analysis examples to assess well performance are set up. Well completion equipment and tools are viewed and discussed. Participants work several exercises such as basic artificial lift designs, acidizing programs, gravel pack designs, and fracturing programs. Shale gas and oil development challenges are thoroughly explained. Horizontal and multilateral technology is presented. Case studies illustrate the multi-discipline interaction required in applying various production technologies to optimize project development and operations.

Candidates can take the following self-paced eLearning courses individually or as a **72-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
The Role of Production Technology	Level 1	2 hrs
Drilling Operations and Well Completions	Level 1	3.5 hrs
Production Principles	Level 1	5 hrs
Well Performance and Nodal Analysis Fundamentals	Level 2	9 hrs
Rod, PCP, Plunger Lift, and Jet Pump	Level 1	4.5 hrs
Reciprocating Rod Pumps Fundamentals	Level 2	8.5 hrs
Gas Lift	Level 1	1.5 hrs
Electric Submersible Pumps (ESP)	Level 1	1.5 hrs
Gas Lift Fundamentals	Level 2	6.5 hrs
Electric Submersible Pumps (ESP) Fundamentals	Level 2	6 hrs
Formation Damage and Matrix Stimulation	Level 1	3 hrs
Perforating	Level 1	3.5 hrs
Sand Control	Level 1	3 hrs
Hydraulic Fracturing	Level 1	4 hrs
Production Problem Diagnosis	Level 1	5 hrs
Production Technology Applications	Level 1	5 hrs

DESIGNED FOR

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

LEVEL: Foundation (Level 2)

Gas Processing

Gas Conditioning and Processing Principles

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are available in self-paced eLearning courses. These competencies set the base knowledge required for a successful career as an entry-level facilities engineer, seasoned operator, and field supervisor.

This series provides an understanding of common terminology, hydrocarbons and their physical properties, qualitative and quantitative phase behavior, hydrates, and fluid flow. In addition, it offers a systematic approach to understanding the common types of equipment and the primary unit operations in offshore and onshore gas conditioning and processing facilities. Candidates can take the following self-paced eLearning courses individually or as a **55-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Hydrocarbon Components and Physical Properties	Level 1	5 hrs
Introduction to Production and Gas Processing Facilities	Level 1	4 hrs
Qualitative Phase Behavior and Vapor-Liquid Equilibrium	Level 1	4.5 hrs
Water/Hydrocarbon Phase Behavior	Level 1	5 hrs
Thermodynamics and Application of Energy Balances	Level 1	3.5 hrs
Fluid Flow	Level 1	5 hrs
Relief and Flare Systems	Level 1	3 hrs
Separation	Level 1	4 hrs
Heat Transfer Equipment	Level 1	3.5 hrs
Pumps and Compressors	Level 1	4 hrs
Refrigeration, NGL Extraction and Fractionation	Level 1	5 hrs
Contaminant Removal – Gas Dehydration	Level 1	4 hrs
Contaminant Removal – Acid Gas and Mercury Removal	Level 1	4.5 hrs

DESIGNED FOR

Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities. A broad approach is taken with the topics, but advanced topics are available in our other gas processing series.

LEVEL: Basic (Level 1)

Acid Gas Removal – Amine-Focused Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Acid gas removal is an important gas conditioning step that is required for natural gas streams that contain moderate to large amounts of carbon dioxide and hydrogen sulfide. The treated gas specification depends upon the downstream requirements, for example if it needs to meet a pipeline tariff specification or if it is flowing to a natural gas liquefaction facility where the specifications will be much more stringent.

Amine acid gas removal units are by far the most common technology used to remove these compounds from natural gas streams.

This series covers different acid gas removal technologies, with a strong focus on natural gas amine treating.

The on-demand instructor-led lecture will cover simple methods to estimate the amine circulation rate for treating a gas stream with and without CO2 slip. In addition, maintaining a water balance in this process unit is critical. The method to estimate a water balance will be presented, as well as the key factors that affect the degree of sweetening (or acid gas removal) possible.

The problem assignment will allow the participants to practice the methods presented in the on-demand instructor-led lecture. The problem set will provide additional insight into the practical aspects of amine treating.

The on-demand instructor-led debrief will work through the insights gained in the problem assignment. Common operating problems and potential solutions will be discussed. During the round table discussion, the participants will be able to share their experiences and to ask detailed questions to the group. Participants may test out of the prerequisites.

DESIGNED FOR

Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Introduction to Gas Processing Facilities Multicomponent Phase Behavior Non-Hydrocarbon Components Effect on Phase Envelopes Fundamental Applications of Phase Envelopes Water Content of Sweet and Sour Natural Gas	3 hr 57 min		3 hr 57 min
Required e-Learning	Acid Gas Removal Acid Gas Removal by Amines Types of Internals in Mass Transfer Devices	1 hr 37 min		1 hr 37 min
Optional e-Learning	Sulfur Recovery and Amine Treating Acid Gas Injection NGL Product Treating	[1 hr 23 min]		[1 hr 23 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Amine Treating Lecture Self-Directed Problem Assignment	3 hr		1 hr 30 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		2 hr 12 min
	Total Duration:	**12 hr 57 min**		**10 hr 39 min**

Centrifugal Compressors Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series covers the fundamentals of centrifugal compressor selection and operations. It also reviews the other types of compressors and their applications. The on-demand instructor-led lecture will prepare the participants to do detailed analysis on centrifugal compressors using the vendors compressor curves. The methods applied will allow one to estimate the required compressor head for a given process operating conditions, estimate the number of impellers required for multistage applications, analyze the effect of changing inlet conditions to centrifugal compressor performance, interpret centrifugal compressor curves, and understand the basics of centrifugal compressor controls.

The problem assignment will review two different centrifugal compressor applications. The first problem assignment involves determining the new operating envelope for a fixed speed centrifugal compressor that was specified for a new field development where the initial production conditions were off from the design conditions of the machine. The second problem investigates a variable speed, multistage centrifugal compressor application and investigates the compressors performance over changing operating conditions, from the initial field start up conditions, through end of life of the plant.

The on-demand instructor-led debrief will provide practical insight regarding options to mitigate operating limitations of centrifugal compressors and discuss common operating problems and potential solutions for both centrifugal and reciprocating compressors. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facility engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Multicomponent Phase Behavior Thermodynamic Principles and the First Law of Thermodynamics Second Law of Thermodynamics and Energy Balance Equations Using PH Diagrams to Perform Energy Balance Calculations	3 hr 59 min		3 hr 59 min
Required e-Learning	Compressor Applications, Types and Selection Compressor Head, Power Requirements and Discharge Temperature Principles of Centrifugal Compressor Operation	1 hr 18 min		1 hr 18 min
Optional e-Learning	Principles of Reciprocating Compressor Operations Principles of Rotary Screw Compressor Operations	[1 hr 2 min]		[1 hr 2 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Centrifugal Compressors Lecture Self-Directed Problem Assignment	3 hr		1 hr 7 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		1 hr 56 min
	Total Duration:	**12 hr 19 min**		**9 hr 22 min**

Centrifugal Pumps Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series covers not only the basics of pumps but also covers the fundamental aspects of centrifugal pump selection and operation. The content sets the foundation for a successful study of the practical application of centrifugal pump analysis. This series will prepare the participant to confidently select centrifugal pumps for different process operating conditions and troubleshoot current pumps operating out in the field from a process performance perspective.

The eLearning courses will prepare participants for a review of the centrifugal pump analysis and selection. During the on-demand instructor-led session, you will learn how to determine the required pump head, NPSHR, and NPSHA for a given pump application. We will review how to develop process system hydraulic curves based upon the flowing conditions and facilities layout and apply the process system curve with the pump curve to determine optimal pump selection. In addition, pump process control options will be discussed.

The virtual, instructor-led lecture is followed by two centrifugal pump assignments (case studies), where delegates apply the analysis methods reviewed during the lecture. The problem assignments will be debriefed in detail, giving additional practical insights into pump selection and operation from a process requirement perspective. The round table discussion will explore common operating problems and potential pump damage for off-design pump operations. Troubleshooting and potential solutions to pump operating problems will also be discussed. Participants will have the opportunity to share their experiences and ask specific application questions. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR	On Demand
Prerequisites	**Day 1**		
	Gas and Liquid Physical Properties Multicomponent Phase Behavior Fundamental Applications of Phase Envelopes	1 hr 41 min	1 hr 41 min
Required e-Learning	Pump Applications, Types and Selection Head vs Pressure Rise and Pump Power Requirements Centrifugal Pumps vs Positive Displacement Pumps Cavitation, NPSHR, NPSHA Principles of Centrifugal Pump Operations Principles of Plunger Pump Operations	2 hr 25 min	2 hr 25 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Fundamentals of Centrifugal Pumps Lecture Self-Directed Problem Assignment	3 hr	2 hr 24 min
	Day 3		
	Problem Debrief and Experience Round Table	3 hr	2 hr 24 min
	Total Duration:	**10 hr 6 min**	**8 hr 16 min**

Fluid Hydraulic Fundamentals – Multiphase Focus for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Multiphase flow in offshore subsea pipelines and gathering systems can present significant operating problems in both offshore and onshore facilities due to operating in the slugging flow regime. This series covers fluid flow fundamentals and has a focus on multiphase flow systems. The on-demand instructor-led lecture will cover simple correlations that will give significant insight into the phenomenon of multiphase flow systems, and what the key operating parameters are that determine the flow regime for a given system or pipeline.

The assigned problem will highlight the governing factors that result in total pressure drop in multiphase systems, and the significant reduction in gathering system capacity even with a small amount of liquids present. The on-demand instructor-led problem debrief session will further develop other important considerations in multiphase flow systems, discuss potential slug mitigation methods, and the round table discussion will allow delegates to share their experiences, challenges and solutions to problems involving multiphase flow systems. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR	On Demand
Prerequisites	**Day 1**		
	Basic Conversions Gas and Liquid Physical Properties Multicomponent Phase Behavior Effect of C6+ Characterization on Phase Behavior Fundamental Applications of Phase Envelopes	2 hr 45 min	2 hr 45 min
Required e-Learning	Estimation and Application of Friction Factors Sizing Piping Systems Pressure Drop in Plant Piping Systems Flow Regimes in Multiphase Flow Systems Difference Between Liquid Holdup and Liquid Volume Fraction Common Slugging Mechanisms Erosional Velocity	2 hr 31 min	2 hr 31 min
Optional e-Learning	Common Gas Transmission Pipeline Flow Correlations and Applications Parameters Affecting Heat Transfer in Piping Systems Newtonian and Non-Newtonian Fluids	[30 min]	[30 min]
Virtual Instructor-Led or On-Demand	**Day 2**		
	Fundamentals of Hydrate Inhibition Lecture Self-Directed Problem Assignment	3 hr	1 hr 45 min
	Day 3		
	Problem Debrief and Experience Round Table	3 hr	1 hr 5 min
	Total Duration:	**11 hr 46 min**	**8 hr 36 min**

Fractionation Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series covers fractionation and stabilization of hydrocarbon liquids at both the basic and fundamental levels. Fractionation is one of the most complex processing units in a gas production and processing facility and is often the least understood. This series will prepare a facilities engineer to understand the operating envelop of stabilization and fractionation columns, what sets the operating pressure and bottoms temperature required, typical fractionation column control options and how to troubleshoot fractionation column operations.

The virtual, instructor-led lecture will cover how to estimate the fractionation column operating pressure and bottoms temperature, as well as cover the different column process control options. The problem assignment will reinforce the key operating principles covered in the instructor led session and will lead to more effective column troubleshooting skills.

The problem debrief will include a process simulation tool that will run the participants through a number of what-if scenarios that will deepen their understanding of how these columns separate the components, but also how they respond depending upon changing inlet conditions, such as ambient temperatures, feed composition changes, and feed rate cooling and heating rate changes. With this knowledge, facility engineers will be better equipped to support operations staff, as well as be more proficient in understanding the critical components for system design, troubleshooting and debottlenecking. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR On Demand	
Prerequisites	**Day 1**		
	Basic Conversions Hydrocarbon Component Families Gas and Liquid Physical Properties Introduction to Gas Processing Facilities Pure Component Phase Behavior Multicomponent Phase Behavior Vapor Liquid Equilibrium Multi-Stage Stabilization of Crude Oil and Condensate RVP and TVP of Condensate and Crude Oils	5 hr 34 min	5 hr 34 min
Required e-Learning	Pump Applications, Types and Selection Head vs Pressure Rise and Pump Power Requirements Centrifugal Pumps vs Positive Displacement Pumps Cavitation, NPSHR, NPSHA Principles of Centrifugal Pump Operations Principles of Plunger Pump Operations	2 hr 35 min	2 hr 35 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Fundamentals of Fractionation Lecture Self-Directed Problem Assignment	3 hr	1 hr 6 min
	Day 3		
	Problem Debrief and Experience Round Table	3 hr	1hr 21 min
	Total Duration:	**14 hr 9 min**	**10 hr 36 min**

Gas/Liquid Separation Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Separators are a critical but often overlooked component in a processing facility. Applications range from bulk separation of fluids to gas scrubbing upstream of compressors and gas polishing upstream of dehydrators and amine systems. Poor separator performance can significantly impair the effectiveness and availability of downstream process equipment, which in turn reduces profitability.

This series covers separation principles, applications, and sizing techniques. We will cover the sizing criteria for 2-phase (gas - liquid) and
3-phase (gas - hydrocarbon liquids - water), separator configurations, components and internal devices. The on-demand instructor-led lecture will cover detailed separator sizing and analysis methods that will allow facilities engineers to do detailed vendor bid package analysis in terms of the proposed separator size, as well as brownfield separator troubleshooting and debottlenecking.

The problem assignments will apply these methods to real-world example problems, and a problem debrief and round table discussion will delve further into practical issues associated with separation equipment, causes of common operating problems, and possible solutions to consider.

This in-depth series is invaluable to facilities engineers that are struggling with operating issues in existing facilities, or for engineers that are currently working on greenfield projects that will be responsible for separator sizing and selection. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Multicomponent Phase Behavior Effect of C6+ Characterization on Phase Behavior Vapor Liquid Equilibrium	3 hr 7 min		3 hr 7 min
Required e-Learning	Principles of Gas Liquid Separation Two-Phase Separation Mist Extraction Devices Vertical and Horizontal Separators	1 hr 34 min		1 hr 34 min
Optional e-Learning	Multi-Stage Stabilization of Crude Oil and Condensate RVP and TVP of Condensate and Crude Oils	[32 min]		[32 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Gas / Liquid Separation Lecture Self-Directed Problem Assignment	3 hr		1 hr 45 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		2 hr 5 min
	Total Duration:	**11 hr 13 min**		**9 hr 3 min**

Heat Transfer Equipment Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series covers heat transfer equipment from the principles of heat transfer to the heat exchanger types and common applications. Heat transfer principles are covered, and detailed heat and material balance calculations are reviewed to allow one to estimate the required heat transfer area for a given heat exchanger application. Detailed hand calculation methods will be presented to estimate the sizing of shell and tube heat exchangers which will emphasize the impact of the effective temperature approaches selected. A case study compares the pros and cons of tighter temperature approaches, and heating and cooling curves will be utilized to investigate heat integration.

This series provides insight into the various heat transfer equipment options and includes simple methods to troubleshoot the performance of existing exchangers through an understanding of principles of heat transfer analysis. These methods can also be applied to check conventional shell and tube heat exchanger vendor bid packages to ensure the vendor is quoting an optimal design for the application. During the problem debrief and round table discussion, delegates will have the opportunity to share their experiences and challenges with heat transfer equipment. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR On Demand	
Prerequisites	**Day 1**		
	Basic Conversions Gas and Liquid Physical Properties Multicomponent Phase Behavior Thermodynamic Principles and the First Law of Thermodynamics Second Law of Thermodynamics and Energy Balance Equations Ethalpy Correlations and Applications of Energy Balance Correlations	3 hr 27 min	3 hr 27 min
Required e-Learning	Types of Heat Exchangers and Their Common Applications Heat Transfer Mechanisms and Parameters Affecting Heat Transfer Coefficient Estimating Exchanger's Heat Transfer Area Shell and Tube Exchanger Types and their Applications Compact Heat Exchanger and Fired Heaters Process Cooling Methods and Air-Cooled Heat Exchangers	1 hr 34 min	1 hr 34 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Fundamentals of Hydrate Inhibition Lecture Self-Directed Problem Assignment	3 hr	1 hr 45 min
	Day 3		
	Problem Debrief and Experience Round Table	3 hr	1 hr 24 min
	Total Duration:	**11 hr 50 min**	**8 hr 46 min**

Hydrate Inhibition Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series describes hydrates and explores conditions favoring hydrate formation. It also describes how to estimate the hydrate formation temperature of a natural gas stream and provides methods to estimate hydrate inhibitor injection requirements. Participants will learn the key differences between low dosage hydrate inhibitors and thermodynamic inhibitors.

The problem assignment will provide technical insight into the differences between methanol and mono-ethylene glycol used as hydrate inhibitors. The problem debrief and round table will explore the advantages and disadvantages of both inhibitors and provide additional depth on practical industry experience regarding hydrate inhibition for both pipeline and NGL extraction plants (such as J-T Valve and Refrigeration facilities) applications.

During the problem debrief and round table discussion, participants will have the opportunity to ask additional questions and share their challenges and experiences with hydrate inhibition.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Multicomponent Phase Behavior Water Content of Sweet and Sour Natural Gas	2 hr 41 min		2 hr 41 min
Required e-Learning	What Are Hydrates and How Are They Formed Hydrate Formation Temperature Preventing Hydrate Formation	1 hr 29 min		1 hr 29 min
Optional e-Learning	Low Dosage Inhibitors	[15 min]		[15 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Hydrate Inhibition Lecture Self-Directed Problem Assignment	3 hr		1 hr 23 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		1 hr 3 min
	Total Duration:	**10 hr 25 min**		**6 hr 51 min**

Hydrocarbon Phase Behavior Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

John M. Campbell often said, "knowledge of the basic fundamentals is the required foundation for a successful professional practice." This is part 2 of the two series that will set the foundation for a successful facilities engineering career. This series covers the fundamentals of hydrocarbon phase behavior, which is key to understanding gas processing facilities, and sets the foundation of being able to "think inside the pipe" for better insight into processing equipment as operating conditions change. We will cover both qualitative and quantitative phase behavior of hydrocarbons for pure components and for multicomponent streams. Being able to predict the phase condition of a hydrocarbon stream is critical in plant operation, troubleshooting and design. This series will give you the tools to do so with a simple, robust, and easy to use process simulator.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR	On Demand
Required e-Learning	**Day 1**		
	Pure Component Phase Behavior Multicomponent Phase Behavior Effect of C6+ Characterization on Phase Behavior Non-Hydrocarbon Components Effect on Phase Envelopes Fundamental Applications of Phase Envelopes Vapor Liquid Equilibrium Multi-stage Stabilization of Crude Oil and Condensate RVP and TVP of Condensate and Crude Oils Asynchronous Problem Assignment	2 hr 58 min	2 hr 58 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Hydrocarbon Phase Behavior Fundamentals Lecture	2 hr 30 min	1 hr 15 min
	Total Duration:	**5 hr 28 min**	**4 hr 13 min**

Molecular Sieve Dehydration Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Molecular sieve dehydration is required upstream of cryogenic turbo-expander gas plants and in front of liquefaction (LNG) facilities. The dehydration unit is critical to the performance of these plants as small amounts of water breakthrough can result in freezing in the downstream heat exchangers, typically Brazed Aluminum Plate Fin exchangers for turbo-expander plants, core and keetle, or possibly coil-wound exchangers for LNG facilities.

Molecular sieve dehydration units are sized and serviced by the molecular sieve vendors. However, facilities engineers need to understand how these dehydrators work and what their key parameters are.

The virtual, instructor-led lecture will cover equilibrium loading, define the mass transfer zone, and discuss the life factors that affect operations. The method to apply these principles to molecular sieve performance test runs will be covered, as well as the benefits of utilizing standby time to extend the life of molecular sieve beds. The problem assignment will work through determining the expected life of a molecular sieve bed using these principles with the results of a performance test run, and to investigate options to extend the bed life.

The problem debrief will cover the practical applications learned in the problem assignment. Common operating problems and potential solutions will be discussed, and the participants will be able to share their experiences and ask detailed questions in the round table discussion. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Introduction to Gas Processing Facilities Multicomponent Phase Behavior Fundamental Applications of Phase Envelopes Water Content of Sweet and Sour Natural Gas	4 hr 27 min		4 hr 27 min
Required e-Learning	Adsorption Dehydration Molecular Sieve Dehydration Performance Parameters Mol Sieve Regeneration Process	1 hr 29 min		1 hr 29 min
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Molecular Sieve Dehydration Lecture Self-Directed Problem Assignment	3 hr		1 hr 36 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		57 min
	Total Duration:	**11 hr 56 min**		**8 hr 29 min**

NGL Extraction Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This series details the processing technology options for hydrocarbon dewpoint control and deep NGL extraction and discusses the considerations that are important to the most optimal process selection for a given field development. The series content will meet the needs of a facilities engineer that is supporting a hydrocarbon dewpoint facility, moderate NGL extraction plants, as well as those assigned to Gas Sub-cooled Process (GSP) or turbo-expander facilities. The key pieces of equipment will be covered, as well as the overall combined processing unit.

The virtual, instructor-led session will review the methods required to analyze the heat and material balance for NGL extraction plants from first principles. The two problem assignments will compare and contrast the differences between two different technologies used for hydrocarbon dewpoint control (mechanical refrigeration and turboexpander plants). These learnings also apply directly to GSP plants.

The problem debrief and round table discussion session will cover the practical learnings gained from the problem assignments. The difference between lean and rich gas processing will be discussed. A deep discussion on the limitations on brazed aluminum heat exchangers and their operating considerations will be held to raise the awareness of the issues associated with this type of heat exchanger. During the round table discussion, common operating problems of refrigeration and turboexpander facilities and their potential solutions will be discussed where the participants will have the opportunity to share their experiences and ask specific questions regarding their specific facilities. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Introduction to Gas Processing Facilities Multicomponent Phase Behavior Effect of C6+ Characterization on Phase Behavior Fundamental Applications of Phase Envelopes Thermodynamic Principles and the First Law of Thermodynamics Second Law of Thermodynamics and Energy Balance Equations	5 hr 8 min		5 hr 8 min
Required e-Learning	NGL Extraction Compact Heat Exchanger and Fired Heaters Operation of Expansion Refrigeration Devices Common Process Configurations NGL Extractions	2 hr 35 min		2 hr 35 min
Optional e-Learning	Mercury Removal Application of Refrigeration Systems Simple Refrigeration Systems Stage Separation vs Fractionation Types of Internals in Mass Transfer Columns	[1 hr 45 min]		[1 hr 45 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Centrifugal Compressors Lecture Self-Directed Problem Assignment	3 hr		1 hr 46 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		2 hr 16 min
	Total Duration:	**15 hr 28 min**		**13 hr 30 min**

Overview of Gas Conditioning and Processing for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format. This series gives a solid understanding of the Natural Gas Value Chain and common terminology in the industry. It discusses the different types of reservoirs and their varying composition. In addition, it will discuss typical contaminants found in produced gas streams, and typical natural gas sales or transportation specifications, including higher heating value and Wobbe number. The products of a typical natural gas processing plant and their associated markets are reviewed.

The primary processing units of gas conditioning and processing are discussed, including NGL extraction. Different NGL extraction recoveries can be achieved depending upon the facilities processing operating objective. For example, hydrocarbon dewpointing of the gas to meet a pipeline tariff specification, or deep NGL recovery to enhance facility profits. Shrinkage is an important consideration for NGL extraction facilities, as it is one of the biggest operating costs. Shrinkage and how it is calculated will also be reviewed.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. By taking the 12 Series, the delegate will essentially complete the Campbell Gas Course®, but in a 3-day class format that allows one to also be available for work assignments.

		Instructor Led OR	On Demand
Required e-Learning	**Day 1**		
	Introduction to Gas Processing & Facilities NGL Extraction	1 hr 59 min	1 hr 59 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	The Natural Gas Value Chain Lecture	2 hr 30 min	1 hr 26 min
	Total Duration:	**4 hr 29 min**	**3 hr 25 min**

Process Engineering Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

This is part 1 of the 2 series that will set the foundation for a successful facilities engineering career. John M. Campbell often said, "knowledge of the basic fundamentals is the required foundation for a successful professional practice." This series will set the initial foundation in facilities engineering by covering the initial basic concepts required to deeply understand gas processing and be able to "look inside the pipe."

With this knowledge, you will better understand your facilities inlet stream compositions and the specific challenges that the composition may present. In addition, the necessary conversions required to do any gas processing or equipment calculation will come quickly and easily to you. This is the first part of the training to allow you to quickly troubleshoot plant operations based upon understanding how hydrocarbon gas and liquid physical properties change based upon the current or forecasted operating conditions.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR	On Demand
Required e-Learning	**Day 1**		
	Basic Conversions Hydrocarbon Component Families Gas and Liquid Physical Properties Hydrocarbon Analysis and C6+ Characterization Asynchronous Problem Assignment	2 hr 38 min	2 hr 38 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Process Engineering Fundamentals Lecture	2 hr 30 min	1 hr 31 min
	Total Duration:	**5 hr 08 min**	**4 hr 09 min**

Propane Refrigeration Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Propane refrigeration is likely the most important utility system in refrigeration NGL extraction plants, and in rich gas turbo-expander facilities.

This series covers the basics of refrigeration systems and builds up to the fundamental knowledge that is required for propane refrigeration system sizing, analysis, and troubleshooting.

Once the foundation is laid with the basic principles, the virtual, instructor-led session will take you through the fundamental sizing equations and analysis to determine a facilities propane refrigeration requirements. The problem assignments will give the participants insight into propane refrigeration operating issues, and limitations.

The virtual, instructor-led debrief will cover the practical insights that were gained from working the assigned problem set, as well as cover mechanical refrigeration system controls, common operating issues, and potential solutions. The round table discussion will allow delegates to ask questions regarding their particular systems and share the current problems and experiences. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led	OR	On Demand
Prerequisites	**Day 1**			
	Basic Conversions Gas and Liquid Physical Properties Pure Component Phase Behavior Thermodynamic Principles and the First Law of Thermodynamics Second Law of Thermodynamics and Energy Balance Equations Enthalpy Correlations and Applications of Energy Balance Correlations Using PH Diagrams to Perform Energy Balance Calculations Compressor Head, Power Requirements and Discharge Temperature	4 hr 29 min		4 hr 29 min
Required e-Learning	Application of Refrigeration Systems Simple Refigeration Systems Operation of Refigeration Systems Economizers in Mechanical Refrigeration Systems	1 hr 39 min		1 hr 39 min
Optional e-Learning	Factors in Selecting Refrigerants, Cascade and Mixed Refigeration Systems	[26 min]		[26 min]
Virtual Instructor-Led or On-Demand	**Day 2**			
	Fundamentals of Propane Refrigeration Lecture Self-Directed Problem Assignment	3 hr		1 hr 20 min
	Day 3			
	Problem Debrief and Experience Round Table	3 hr		1 hr 30 min
	Total Duration:	**12 hr 34 min**		**9 hr 24 min**

TEG Dehydration Fundamentals for Facilities Engineers

ABOUT THIS SERIES

The Campbell Gas Course® has been the industry standard for more than 50 years, and the core competencies of the Campbell Gas Course® are now available in eLearning format.

Dehydration is the process of removing water from a gas so that no condensed water will be present in the system. Water is the most common contaminant in produced natural gas, and is a source for not only hydrates, but corrosion and erosion problems in equipment and pipelines. TEG Dehydration is by far the most common technology used to dehydrate natural gas. These units are often utilized as field dehydration units to prevent hydrates from forming in gathering systems, and in-plant facilities to meet a pipeline water dewpoint specification. Despite TEG Dehydration being used so frequently, these units are subject to multiple operating conditions and limitations depending upon how the system was specified and built.

The on-demand instructor-led lecture will cover the fundamental application of TEG dehydration calculations and analysis. The key performance parameters of these units will be covered in detail. The problem assignment will give participants insight into the issues and limitation of TEG Dehydration technology.

The problem debrief and round table discussion will delve into common operating problems, potential solutions as well as give participants the opportunity to share their experiences. Participants may test out of the prerequisites.

DESIGNED FOR

Mid-career professionals who need to get quickly up to speed on a facilities engineering topic for a project need, or for a reassignment to a field in which they do not have significant experience. Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This series is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

		Instructor Led OR	On Demand
Prerequisites	**Day 1**		
	Basic Conversions Gas and Liquid Physical Properties Introduction to Gas Processing Facilities Multicomponent Phase Behavior Water Content of Sweet and Sour Natural Gas Vapor Liquid Equilibrium	5 hr 14 min	5 hr 14 min
Required e-Learning	Gas Dehydration Processes Glycol Dehydration Methods to Mitigate Emissions Types of Internals in Mass Transfer Columns	2 hr 27 min	2 hr 27 min
Virtual Instructor-Led or On-Demand	**Day 2**		
	Fundamentals of TEG Dehydration Lecture Self-Directed Problem Assignment	3 hr	1 hr 26 min
	Day 3		
	Problem Debrief and Experience Round Table	3 hr	1 hr 20 min
	Total Duration:	**13 hr 41 min**	**10 hr 29 min**

Process Facilities

Introduction to Oil and Gas Production Facilities

ABOUT THIS SERIES

This series introduces oil and gas production facilities at the awareness level. It covers the following topics with self-paced activities. This series is only available as a program.

- Overview of the oil and gas industry
- Overview of qualitative phase behavior and reservoirs
- Important hydrocarbon properties and terminology
- Typical sales/disposal specifications
- Flowlines, piping, and gathering systems
- Production separation
- Oil processing
- Water injection systems (including pumps)
- Gas handling – compression, dehydration
- Measurement and storage
- Other facilities considerations – utilities, process safety
- Midstream facilities – gas processing, pipelines, LNG

DESIGNED FOR

Those interested in an overview of production facilities, including subsurface professionals, line managers, sales or business development staff, environmental personnel, operations staff, and those new to the industry, such as entry-level (1-2 year) engineers.

LEVEL: Basic (Level 1)

Oil Production and Processing Facilities Principles for Engineers

ABOUT THIS SERIES

This series emphasizes oil production facilities – from the wellhead to delivering a specification crude oil product to the refinery. Both onshore and offshore facilities are discussed. Produced water treating and water injection systems are also covered. Solution gas handling processes and equipment will be discussed at a high level. In addition to the engineering aspects of oil production facilities, practical operating problems are covered, including emulsion treatment, sand handling, dealing with wax and asphaltenes, etc. Exercises requiring calculations are utilized throughout the series. The series intended to complement the G-4 Gas Conditioning and Processing series, focused on the gas handling side of the upstream oil and gas facilities area.

Candidates can take the following self-paced eLearning courses individually or as a **48-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Overview of Reservoir Engineering for Facilities Operations	Level 1	3 hrs
Gas, Oil, and Water Composition and Properties	Level 1	5 hrs
Oil Gathering Systems Fundamentals	Level 2	2 hrs
Gas-Liquid Separation Fundamentals	Level 2	3.5 hrs
Oil-Water Separation Fundamentals	Level 2	2.5 hrs
Oil Treating and Desalting Fundamentals	Level 2	5 hrs
Oil Stabilization, Sweetening, Storage, and VRU Crude Fundamentals	Level 2	3 hrs
Water/Hydrocarbon Phase Behavior	Level 1	5 hrs
Flow Assurance Fundamentals for Surface Facilities	Level 2	4 hrs
Transportation of Crude Oil Fundamentals	Level 2	3 hrs
Produced Water Treatment Fundamentals	Level 2	5 hrs
Water Injection Systems Fundamentals	Level 2	4 hrs
Overview of Solution Gas Handling Fundamentals	Level 2	3.5 hrs

DESIGNED FOR

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

LEVEL: Foundation (Level 2)

Process Safety Engineering Principles

ABOUT THIS SERIES

This series provides an overview of process safety engineering fundamentals for hydrocarbon processing facilities. The focus is on the engineering/design aspects of Process Safety Management. Historical incidents and recurring problem areas will be frequently referenced. Techniques for analyzing and mitigating process safety hazards applicable to oil and gas processing will also be reviewed. Integrating the concepts covered to achieve a measured approach to Process Safety Engineering is a key aim of this series.

Candidates can take the following self-paced eLearning courses individually or as a **35-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Process Safety Risk Analysis and Inherently Safer Design	Level 1	5 hrs
Process Hazards Analysis and Layers of Protection Analysis	Level 1	3.5 hrs
Leakage and Dispersion of Hydrocarbons	Level 1	2.5 hrs
Combustion Behavior of Hydrocarbons	Level 1	3 hrs
Sources of Ignition and Hazardous Area Classification	Level 1	3 hrs
Specific Plant Systems and Equipment	Level 1	4.5 hrs
Relief and Flare Systems	Level 1	3 hrs
Historical Incident Databases, Plant Layout, and Equipment Spacing	Level 1	3 hrs
Fire Protection Systems	Level 1	3.5 hrs
SIS, Monitoring and Control	Level 1	3.5 hrs

DESIGNED FOR

Anyone who needs to work with process safety engineers; this would include facilities engineers, operations and maintenance supervisors, project engineers and managers, entry-level process safety engineers, experienced professionals new to oil and gas, and anyone who needs a general understanding of the breadth of the process safety engineering discipline. Technical staff from insurance companies and regulatory agencies have found the series useful.

LEVEL: Basic (Level 1)

Process Safety Engineering Fundamentals

ABOUT THIS SERIES

This series extends the Process Safety Engineering Principles series to the Foundation level. Course material is reinforced using problems, simple calculations, and applications to an example facility. The applications provide an opportunity to integrate the concepts and methods in an oil and gas environment.

Candidates can take the following self-paced eLearning courses individually or as a **43-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Risk Analysis and Inherently Safer Design Fundamentals	Level 2	8.5 hrs
PHA Techniques and LOPA Fundamental	Level 2	8 hrs
Leakage and Dispersion, Combustion Behavior, Sources of Ignition Fundamentals	Level 2	5.5 hrs
Historical Incident Databases, Metrics, and Specific Facilities (Bad Actors) Fundamentals	Level 2	4 hrs
Relief, Flare, and Depressurization Fundamentals	Level 2	6.5 hrs
Controls and Safety Instrumented Systems Fundamentals	Level 2	5.5 hrs
Spacing and Layout, Fire Prevention Fundamentals	Level 2	4.5 hrs

DESIGNED FOR

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

LEVEL: Foundation (Level 2)

Mechanical Engineering

Basics of Rotating Mechanical Equipment

ABOUT THIS SERIES

This series provides an overview of mechanical rotating equipment. The focus is on equipment selection of pumps, compressors, and drivers and their integration into the process scheme and control strategy in upstream and midstream oil and gas facilities. Compressor and pump sizing are addressed, as well as sizing of drivers, including engines, electric motors, and turbines. Commissioning and installation are reviewed to ensure optimal equipment integrity and reliability for the life of the plant. The material of the course is applicable to field production facilities, pipelines, gas plants, and offshore systems.

Candidates can take the following self-paced eLearning courses individually or as an **18-hour online series**. A certificate with Continuing Education Units (CEU) is issued upon completion of each eLearning course.

eLearning Course Name		
Pumps and Compressors	Level 1	4 hrs
Reciprocating Engines for Process Facilities	Level 1	2.5 hrs
Gas and Steam Turbine	Level 1	4.5 hrs
Machinery Design, Materials and Subsystems	Level 1	4.5 hrs
Mechanical Equipment Inspection, Operation and Maintenance	Level 1	2 hrs

DESIGNED FOR

Facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

LEVEL: Basic (Level 1)

Basics of Static Mechanical Equipment

ABOUT THIS SERIES

This series provides an overview of mechanical, non-rotating, static equipment. The focus is on equipment selection and integrity of pressure vessels, piping, and heat exchangers and their integration into the process scheme and control strategy in upstream and midstream oil and gas facilities. The series addresses code requirements focusing on ASME Boiler & Pressure Vessel code as well as B31 code and API tank construction codes. This series discusses heat exchanger sizing and TEMA requirements and reviews piping hydraulics and corrosion mechanisms to ensure correct equipment sizing and integrity management. The series applies to field production facilities, pipelines, gas plants, and offshore systems.

Candidates can take the following self-paced eLearning courses individually or as a **31-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Mechanical Equipment	Level 1	3 hrs
Properties of Materials	Level 1	2.5 hrs
Piping Systems and Welding	Level 1	5 hrs
Heat Transfer Equipment	Level 1	3.5 hrs
Unfired Pressure Vessels	Level 1	3 hrs
Fired Heaters and Boilers	Level 1	4 hrs
Storage Tanks	Level 1	1.5 hrs
Corrosion Control and Protection	Level 1	2.5 hrs
Fire Protection Systems	Level 1	4 hrs
Mechanical Equipment Inspection, Operation, and Maintenance	Level 1	2 hrs

DESIGNED FOR

Facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

LEVEL: Basic (Level 1)

Instrumentation and Controls

Industrial Automation for Oil and Gas Applications

ABOUT THIS SERIES

This series provides an introduction and overview of electrical systems, instrumentation, control valves, process control, control/safety, and SCADA systems typically encountered in oil and gas facilities. The focus is understanding terminology, concepts, typical equipment configurations, applicable codes and standards, project execution strategies, and common pitfalls to improve communication with electrical and I&C professionals.

Candidates can take the following self-paced eLearning courses individually or as a **48-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Control Systems for Oil and Gas Applications (Part 1)	Level 1	4 hrs
Control Systems for Oil and Gas Applications (Part 2)	Level 1	4.5 hrs
Instrumentation Selection for Oil and Gas Applications (General)	Level 1	5 hrs
Instrumentation Selection for Oil and Gas Applications (Flow)	Level 1	6 hrs
Instrumentation Selection for Oil and Gas Applications (Level)	Level 1	4 hrs
Instrumentation Selection for Oil and Gas Applications (Pressure, Temperature)	Level 1	4.5 hrs
Instrumentation Selection for Oil and Gas Applications (Analysis)	Level 1	4.5 hrs
Control Valves for Oil and Gas Applications	Level 1	5.5 hrs

DESIGNED FOR

Process, chemical, and mechanical engineers (i.e., non-instrumentation and non-electrical disciplines) and other technical and non-technical professionals with little or no background in IC&E systems.

LEVEL: Basic (Level 1)

Electrical Engineering

Introduction to Electrical Engineering

ABOUT THIS SERIES

This series is focused on educating electrical engineers on the essential principles of electrical safety, system design, and maintenance. The series focuses on foundational concepts rather than regional codes and standard requirements. Still, it does cover common international (IEC, EN, BS, etc.) and North American (NEC, IEEE) standards related to design and safe operation.

Candidates can take the following self-paced eLearning courses individually or as a **27-hour online series**. A certificate with Continuing Education Units (CEU) is issued upon completion of each eLearning course.

eLearning Course Name		
Principles of Power Systems in Oil and Gas Applications (Part 1)	Level 1	3.5 hrs
Principles of Power Systems in Oil and Gas Applications (Part 2)	Level 1	3 hrs
Electric Motors and Motor Control in Oil and Gas	Level 1	2 hrs
Hazardous Area Classification and Installation in Oil and Gas Facilities	Level 1	2.5 hrs
Division-based Equipment Selection and Installation in Oil and Gas Facilities	Level 1	2.5 hrs
Zone-based Equipment Selection and Installation in Oil and Gas Facilities	Level 1	2 hrs
Electrical Safety in Design for Oil and Gas Facilities	Level 1	4 hrs
NEC-Based Electrical Design, Installation, and Safety Codes	Level 1	7 hrs

DESIGNED FOR

Facilities personnel who interface with facility electrical power systems, including project engineers, operation leads, instrumentation, controls personnel, and electrical engineers who are new to electrical power systems within oil and gas facilities.

LEVEL: Basic (Level 1)

Pipeline Engineering

Pipeline Engineering Principles

ABOUT THIS SERIES

This series integrates the skills associated with planning, evaluation, design, construction, operation, and asset integrity through asset retirement and abandonment, applied to onshore and offshore pipelines.

The series covers typical pipeline life cycle activities, starting with the definition of the need for the pipeline, sizing parameters, route selection, environmental concerns, and protection. It is followed by design requirements, strength requirements, and construction activities through commissioning. The series then covers the operating life of the pipeline, including maintenance and leak detection, monitoring and integrity, repair, replacement, and alteration activities, leading to retirement and abandonment.

The series' design aspect focuses on meeting the pipeline capacity requirements while complying with all strength code requirements and environmental protection codes and regulations. For offshore pipelines, these include on-bottom stability, spanning requirements, shore crossing design, and applying the most suitable construction methods for the challenge encountered.

Candidates can take the following self-paced eLearning courses individually or as a **22-hour online series**. A certificate with Continuing Education Units (CEU) is issued upon completion of each eLearning course.

eLearning Course Name		
Pipeline Routing and Geomatics	Level 1	2 hrs
Pipeline O&M, Leak Detection, Repairs, Alterations, and Abandonment	Level 1	3.5 hrs
Compliance and Pollution Events and Environmental Impacts and Assessments	Level 1	2.5 hrs
Pipeline Hydraulics and Flow Assurance	Level 1	3 hrs
Pipeline Strength, Stability, and Environmental Considerations	Level 1	5 hrs
Pipeline Pump and Compressor Stations and Terminals	Level 1	1.5 hrs
Pipeline Construction	Level 1	4.5 hrs

DESIGNED FOR

Pipeline project managers and engineers, operations and maintenance supervisors, regulatory compliance personnel, and other technical professionals with 1-3 years of experience in natural gas, crude oil, refined petroleum products, LPG, NGL, chemical, carbon dioxide pipeline engineering, construction, operations, or maintenance.

LEVEL: Basic (Level 1)

Downstream

COMING SOON

Introduction to Refining Operations for Engineers

ABOUT THIS SERIES

This series has been designed for early and mid-career refining engineers and includes a variety of topics of great interest for supporting the refining operation activities. Subject matters as supervision skills, crude and products movement operations, corrosion control, electrical topics for non-electrical engineers, QA/QC lab management, and routine maintenance and turnaround planning are discussed under a friendly platform with the most modern learning tools to ensure the knowledge basis creating for ensure a safety and continuous refining operations.

Candidates can take the following self-paced eLearning courses individually or as a **~46-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Refining and Petrochemical Operation Supervisory Skills	Level 1	~5 hrs
Refining Oil Movement and Storage Operation Skills	Level 1	5 hrs
Refinery Corrosion Overview	Level 1	~1 hr
Refinery Separation Processes Corrosion	Level 1	~1 hr
Refinery Conversion Processes Corrosion	Level 1	~5 hrs
Refinery Treatment Process Corrosion	Level 1	~1 hr
Refinery Storage Corrosion	Level 1	~1 hr
Principles of Power Systems in Oil and Gas Applications (Part 1)	Level 1	3.5 hrs
Principles of Power Systems in Oil and Gas Applications (Part 2)	Level 1	3 hrs
Refining and Petrochemicals QA/QC Laboratory Management	Level 1	~5 hrs
Refining and Petrochemicals Turnaround Planning and Control	Level 1	5.5 hrs
Refining and Petrochemicals Routine Maintenance, Planning, and Control	Level 1	~5 hrs
Reliability Centered Maintenance (RCM)	Level 1	~5 hrs

DESIGNED FOR

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

LEVEL: Basic (Level 1)

Project Management

Facilities Project Management

ABOUT THIS SERIES

This series addresses Conventional and Unconventional (Shale) project management principles and practices related to engineering design, procurement, and construction activities. Upon completing this series, the participant will know the engineering, procurement, and construction phases and how to identify and organize project teams. You will also be able to use fit-for-purpose project management techniques and project control tools to facilitate successful project outcomes. The schedule and cost management training will help the project manager make the best decisions possible. Participants will understand how the project management, drilling and completion, HSE, land, production, and transportation disciplines relate to one another and what tools the project manager can use to ensure interfaces among key stakeholders are managed.

Candidates can take the following self-paced eLearning courses individually or as a **31-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Onshore Field Development Programs and Projects	Level 1	3 hrs
Project Governance	Level 1	3 hrs
Project Resources and Organization	Level 1	2.5 hrs
Scope Delivery	Level 1	2.5 hrs
Design Engineering Management	Level 1	2.5 hrs
Acquiring Goods and Services	Level 1	3 hrs
Construction Management	Level 1	3 hrs
Project Risk Management	Level 1	3 hrs
Cost Estimating for Facility Projects	Level 1	2 hrs
Scheduling	Level 1	2 hrs
Progress Measurement	Level 1	2.5 hrs
Interface Management for Programs and Projects	Level 1	2 hrs

DESIGNED FOR

Early career project managers, project engineers, facility engineers, production engineers, project control representatives, and purchasing personnel who plan, manage, or participate on multi-discipline shale field development project teams. Conventional and Unconventional (Shale) projects ranging from $5 MM to $50 MM, including well flow lines, tank batteries, booster compressors, short pipelines, and meter stations, that are a part of a larger field development program.

LEVEL: Basic (Level 1)

Business and Management

Basic Petroleum Economics

ABOUT THIS SERIES

Could you answer the following three questions for your next project? What will it cost? What is it worth? Will it earn sufficient profit? Before undertaking any project, these questions should be answered. This series will provide the fundamentals necessary to enable you to do so. Budgeting and financing, accounting, and contractual arrangements, which also significantly impact the economic viability of a project, are covered. Participants practice cash flow techniques for economic evaluations and investigate frequently encountered situations.

Candidates can take the following self-paced eLearning courses individually or as a **21-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Production Forecasting	Level 1	3 hrs
Oil and Gas Pricing	Level 1	2.5 hrs
Cash Flow	Level 1	2.5 hrs
Economic Decision Tools	Level 1	3.5 hrs
Risk and Uncertainty	Level 1	3 hrs
Financing and Ownership	Level 1	2 hrs
Petroleum Industry Accounting	Level 1	2.5 hrs
Budgeting	Level 1	2 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

Petroleum Risk and Decision Analysis

ABOUT THIS SERIES

Good technical and business decisions are based on competent project costs, benefits, and risks analysis. Participants learn the decision analysis process and foundation concepts to participate actively in multi-discipline evaluation teams. The focus is on designing and solving decision models. About half the problems relate to exploration. The methods apply to R&D, risk management, and all capital investment decisions. Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations. Decision trees and influence diagrams provide clear communications and the basis for valuing each alternative. A hand-calculation exercise delivers a detailed experience in Monte Carlo simulation. The mathematics are straightforward and mostly involves only common algebra. The emphasis is on practical techniques for immediate application.

Candidates can take the following self-paced eLearning courses individually or as a **~24-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Decision Analysis Process	Level 1	4.5 hrs
Value of Control Fundamentals	Level 2	4 hrs
Value of Information and Bayes' Rule Fundamentals	Level 2	4 hrs
Decision Policy and Value Calculations Fundamentals	Level 2	6.5 hrs
Monte Carlo Simulation and Distributions Fundamentals	Level 2	2.5 hrs
Judgments and Biases Fundamentals	Level 2	2 hrs

DESIGNED FOR

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

LEVEL: Foundation (Level 2)

Data Science and Analytics

The Impact of Data Analytics on the New Digital Oilfield

ABOUT THIS SERIES

The oil and gas industry is interested in emerging digital technology advances and many, if not most, operators and oilfield service companies are embracing the strategy of digital transformation. This series is an examination of the progress, successes, and challenges the industry is facing. It answers questions like:

- How does "digital" help the industry cope with the headwinds of economic (lower prices) and greater regulatory expectations? Can "digital" help the industry create a niche in a "green" new order?
- How is the industry faring in adopting new "digital" technologies and more efficient ways of doing business? Are we finally overcoming the challenges of a poor data foundation and resistance from an old-school organizational culture?
- Do we understand the impact the new generation of workers will have in digitally transforming the business and the technologies and business changes they will want to implement? Are the best and brightest next-generation talents attracted to the oil patch these days?
- How is the industry doing in shaking off its image of slow adopters and "digital laggards" from the tech community? Have we finally broken out from a long list of pilots and reached enterprise scale?
- Is the industry finding value from "digital" investments? Can we tell a good "digital" story to our investors, CFO, supply chain partners and show them a return on our projects? Is the story in dollars, not just barrels?

Candidates can take the following self-paced eLearning courses individually or as a **24-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to the Digital Oilfield	Level 1	4.5 hrs
Operational Technology and Field Networks	Level 1	4 hrs
Digital Oilfield Challenges, Barriers to Adoption, and Risks	Level 1	4 hrs
Data Foundation for the Digital Oilfield	Level 1	5 hrs
The Future of the Digital Oilfield	Level 1	6 hrs

DESIGNED FOR

Engineers, geoscientists, and data analysts who need to understand how this field is evolving.

LEVEL: Basic (Level 1)

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

ABOUT THIS SERIES

The interpretation of rich, heterogeneous, and even real-time data has become possible because of recent advances in machine learning and the democratization of computational power. The oil and gas industry invests in this data-driven revolution to create actionable insights from diverse data streams. These include geophysical measurements, geological interpretation, real-time production and drilling data streams, and newer data types such as image data and distributed fiber optic sensing, such as DTS/DAS measurements.

Learning how to synthesize the ingredients of a machine-learning workflow requires an incremental, step-by-step approach, which this series provides. Beginning with the concepts of exploratory data analyses, followed by a discussion of learning algorithms for clustering, classification, and regression, this series explores several data analytics and machine learning use cases for subsurface applications and prepares participants to analyze machine learning workflows.

Candidates can take the following self-paced eLearning courses individually or as a **10-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to Data-driven Workflows	Level 1	3 hrs
Supervised Machine Learning	Level 1	4 hrs
Unsupervised Machine Learning and Clustering	Level 1	2.5 hrs

DESIGNED FOR

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

LEVEL: Basic (Level 1)

eLearning Course Descriptions by Discipline

E&P Industry and Asset Life Cycle [IAM-EIA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

In this eLearning course, you will learn about asset life cycle economics and the phases of the asset life cycle, including exploration, appraisal, development, and production, as well as mature production and enhanced oil recovery. You will also learn about the historical, geographical, and modern context of the petroleum industry, its organization, the petroleum value chain, and economic drivers.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- Historical petroleum occurrences and usage
- The phases of the E&P asset life cycle
- The objectives and processes of the exploration phase of the E&P asset life cycle
- The objectives, processes, and economic metrics of the appraisal phase of the E&P asset life cycle
- The objectives and processes involved in the development and production phase of the E&P asset life cycle
- The objectives and processes involved in the mature production phase in the E&P asset life cycle
- Basic reserves and production value concepts

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Hydrocarbon Reservoirs [IAM-HRC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course will teach you about basins and plays, unconventional resources, and petroleum systems. It will also cover structural stratigraphic traps and reservoir mapping.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- Exploration concepts
- Elements of a successful petroleum system
- Key differences between unconventional and conventional petroleum systems
- Different types of structural traps
- Different types of stratigraphic traps
- Features of structural contour and isopach maps

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Petroleum Geology [IAM-PGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

In this eLearning course, you will learn about Earth's structure and plate tectonics, types of rocks, the rock cycle, clastic, biogenic, and chemical-source sedimentary rocks, historical geology, depositional environments, and global versus regional stratigraphy.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- The Earth’s structure, continental drift, and plate tectonics role in oil and gas exploration
- Rock types and classification in an oil and gas context
- The relationship between depositional environments and geological settings
- The importance of historical geology in finding oil and gas accumulations
- The relative age of rocks and how we date the rocks and understand the paleo-climate
- The relationships between global and regional stratigraphy

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Production Operations
[IAM-POC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, you will learn about production roles, artificial lifts (including beam pumps, gas lift, and submersible pumps), production logging, and workover operations. You will also learn about the integrated production system, fluid separation, emulsion breaking, crude products, gas separation and natural gas processing, NGL usage, and natural gas conversion to LNG and GTL.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- The contrasting roles of reservoir and production engineers
- The different types of artificial lift
- The purpose of production logging and workover operations
- How the integrated production system prepares hydrocarbons for transportation
- About oil separation and processing
- About gas separation and processing
- How natural gas is distributed

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Rock and Fluid Properties
[IAM-RFP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, you will learn about reservoir rock properties: porosity and permeability, grain size, distribution, and sorting. You will also learn about reservoir fluids, physical and chemical properties, and the impact on these properties at reservoir and surface conditions. Reservoir classification and phase diagrams are also discussed. In the Hydrocarbon Recovery section, you will learn about primary recovery drives such as dissolved gas (solution gas) drive, water drive, gas cap expansion drive, and combination drives. You will also learn about enhanced oil recovery, including secondary and tertiary recoveries such as water flood, miscible flood, steam cycle, and steam drive, along with expected recovery efficiencies.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- The basic reservoir rock properties and the significance of samples
- The factors that affect porosity and how it is measured
- The factors that affect permeability and how it is measured
- How grain size, distribution, and sorting controls reservoir quality
- How to estimate reservoir economic potential
- The fundamental classification of hydrocarbons as paraffin, naphthene, and intermediate series
- API gravity classification and nomenclature for different crudes
- Reservoir conditions and stock tank conditions and their effect on reservoir fluids
- The relationship between fluid properties and phase behavior
- The importance of phase diagrams to understanding reservoir behavior
- How to differentiate conditions expressed on a phase diagram
- How to relate fluid properties and phase diagram conditions to “our reservoir”

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Surface/Subsurface Exploration
[IAM-SSE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, you will learn about basins, plays and risk analysis, mineral ownership, and contracts; and surface exploration technologies, such as gravity, magnetic and geochemical surveys and seismic imaging and interpretation. Subsurface technologies such as mud logging, appraisal wells, coring, well logging, and drill stem testing.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- The roles involved in exploration
- About basins, plays, leads, prospects, and geological risk
- Different types of oil and gas contracts
- The purpose and types of surface exploration technologies
- The purpose and function of seismic surveys
- The basic structural information from a seismic survey
- The role of exploration and appraisal wells

Formation evaluation tools used during the exploration phase, including mudlogging and LWD, well logging ands, and well tests (DST)

This eLearning course is included in the Overview of the Petroleum Industry eLearning series.

Basic Petroleum Geology – Introduction [GEO-GOC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This introductory eLearning course provides an overview of Petroleum Geology and the Petroleum System Concept. Its purpose is to familiarize learners with basic aspects of Petroleum Geology and the role of the Petroleum Geologist in the overall process of Petroleum Exploration and Production for both Conventional and Unconventional Resources.

Designed for

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

You will learn

- The main elements and processes that comprise the petroleum system
- The basics of reservoir fluids—oil, gas, and water
- The phases and stages of exploration, field development, and production for conventional oil and gas fields
- The main phases of the exploration and development process for unconventional resources
- Key technological developments in the history of the oil and gas industry and their impact on petroleum geology

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Foundation Geological Concepts [GEO-FGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course introduces basic geological concepts that form the foundation for petroleum geology. There are three sections:

1. The Rock Cycle, focusing on the rocks and minerals that comprise the Earth's crust
2. Geologic Time and Stratigraphy
3. Plate Tectonics and Sedimentary Basin Evolution

Knowledge of these basic geologic concepts is crucial preparation for understanding petroleum geology in the overall process of petroleum exploration and production for both conventional and unconventional resources.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn

- The Rock Cycle, including the three kinds of rocks and how they form
- How to differentiate between a mineral and a rock and how to distinguish one mineral from another based on physical properties
- Key concepts of geological time and the difference between relative and radiometric geological time
- Stratigraphic principles and the difference between lithostratigraphy and chronostratigraphy
- How sequence stratigraphic analysis aids in the characterization of petroleum systems
- Key concepts of plate tectonics, including seafloor spreading and plate margin types
- The main types of sedimentary basins and their evolution in the context of plate tectonics

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Petroleum System – Examples [GEO-EXC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

To reinforce the petroleum system concepts presented in other Basic Petroleum Geology – Petroleum System eLearning courses, this eLearning course describes examples of petroleum systems. The first part focuses on examples of marine basin petroleum systems, characterized by marine shale source rocks. The second part of the eLearning course provides an example of a terrestrial basin petroleum system characterized by a lake or lacustrine shale source rocks.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in petroleum exploration and production who needs to understand petroleum geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Describe the North Sea Central Graben as an example of a vertically drained marine basin petroleum system
- List elements of the North Sea Central Graben petroleum system, explain its timing, and define its critical moment
- Describe the Ekofisk Field as an example of the North Sea Central Graben petroleum system
- Describe the East Venezuela Basin as an example of a laterally drained marine basin petroleum system
- Describe the Songliao Basin, NE China as an example of a terrestrial basin petroleum system
- List elements of the Songliao Basin petroleum system, explain its timing, and define its critical moment
- Describe the Daan Field as an example of the Songliao Basin petroleum system
-

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Petroleum System – Overview and Source [GEO-RFS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course is presented in two parts. The first part provides an introduction and overview of the petroleum system concept. It summarizes the essential elements and processes of a petroleum system and emphasizes and explains the importance of their timing. The second part explains the basic concepts of source rock characteristics and quality and the processes of source rock thermal maturation and hydrocarbon generation. It also introduces the main depositional controls for siliciclastic shale and carbonate source rocks.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn

- The basic elements and processes of the petroleum system concept
- The characteristics of high-quality source rocks and the concepts to TOC% (Total Organic Carbon Content) and kerogen type
- The differences between oil and gas source rocks
- The different measures for source rock maturity and how these are used to define the hydrocarbon generation history of source rock units
- The main depositional controls for clastic and carbonate source rocks and the importance of anoxic conditions for the accumulation of organic source rock material

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Petroleum System – Reservoir and Seal [GEO-RSC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course is presented in two parts, focusing on two essential elements of the Petroleum System. The first part explains the basic concepts of reservoir rock characteristics and describes key depositional and post-depositional factors impacting reservoir quality. Clastic, carbonate, and naturally fractured reservoirs, including field examples, are introduced. The second part explains the basic concepts of seal rock characteristics and quality. Different types of seals, including fault seals, are considered, and depositional controls for examples of key seal lithologies are described.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn

- The concepts of reservoir porosity and permeability
- Controls on reservoir quality by texture
- Post-depositional and diagenetic processes that affect Reservoir Quality
- Classification systems for clastic and carbonate reservoir rocks
- The concept of net pay
- The different types of naturally fractured reservoirs and the concept of dual porosity systems
- The concepts of seal rock characteristics and quality
- The different types of fault seals, including juxtaposition and fault smear seals

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Petroleum System – Trap and Timing [GEO-TTC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course is presented in two parts, focusing on two essential processes of the Petroleum System. The first part covers basic structural geology concepts and then explains the essential process of petroleum trap formation. Both structural and stratigraphic traps are described, and field examples are provided. The second part explains the essential process of hydrocarbon generation and migration, emphasizing the importance of the timing of the process relative to the timing of trap formation.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in petroleum exploration and production who needs to understand petroleum geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Identify, describe, and understand the formation of key geological fold and fault structures
- Describe principle stress configurations and the implications for the orientation of fractures and faults
- Explain the concept of strike and dip for characterizing the orientation of geologic strata and structures
- Explain the difference between structural and stratigraphic trap
- Recognize uncertainties associated with fault trap
- Describe the types of structural traps associated with extensional, compressional, and strike slip tectonic settings
- Explain the meaning of timely maturation and migration and the concept of “critical moment” for a petroleum system

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Phases of Conventional Exploration and Development [GEO-PCE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course explains the Exploration and Production (E&P) Cycle. The second part of the eLearning course describes the Exploration Phase of Conventional Projects, including the progression from regional basin studies to Exploration Play Concept development, the delineation of Exploration Leads, and the definition of drillable Prospects. The third part of the eLearning course describes the Conventional Field Development process, which consists of four Stages: 1) Discovery and Initial Appraisal of the accumulation, 2) Full Appraisal, 3) Primary Development of the field, and 4) Enhanced Recovery.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in petroleum exploration and production who needs to understand petroleum geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Explain the concept of the Exploration and Production or E&P Cycle
- Understand the steps in the Exploration Process and the work done in each:
  - Play Concept Definition
  - Lead Identification
  - Prospect Definition
- Describe the four Stages of Conventional Field Development:
  1. Discovery and Initial Appraisal
  2. Full Appraisal
  3. Primary Development
  4. Enhanced Recovery
- Understand the concept of Reservoir Flow Units as the basis for a common industry technique of reservoir zonation

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Sedimentary Geology – Depositional Controls for Carbonate Reservoir Rocks [GEO-SGD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

The basic concepts of sedimentary geology, including depositional controls for sedimentary rocks, form an essential part of the foundation for petroleum geology. Reservoir rock is one of the essential elements of a Petroleum System. Because reservoir rock quality and thickness attributes are often closely tied to depositional origin, geologists need to understand the main depositional controls and know key depositional environments to characterize reservoir rocks and predict their distribution properly. This eLearning course introduces depositional controls and the main depositional environments for carbonate reservoir rocks. Important post-depositional diagenetic processes affecting carbonate reservoir rock quality are also introduced.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn

- The main depositional controls for carbonate (e.g., limestone) reservoir rock distribution and how they differ from clastics (e.g., sandstone)
- Classification system for carbonate rocks
- To describe the models for key depositional environments of carbonate sediments
- To distinguish the textural characteristics of carbonate deposits in different settings and describe the implications for reservoir quality and trends
- The main diagenetic processes affecting carbonate rocks and their impact on reservoir quality

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Sedimentary Petroleum Geology – Depositional Controls for Clastic Reservoir Rocks [GEO-SGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

The basic concepts of sedimentary geology, including depositional controls for sedimentary rocks, form an essential part of the foundation for petroleum geology. Reservoir Rock is one of the essential elements of a petroleum system. Because reservoir rock quality and thickness attributes are often closely tied to depositional origin, geologists need to understand the main depositional controls and know key depositional environments to characterize reservoir rocks and predict their distribution properly. This eLearning course introduces depositional controls and the main depositional environments for clastic reservoir rocks, a category that is mainly comprised of sandstone and conglomerate.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn

- The main depositional controls for clastic (e.g., sandstone) reservoir rock distribution
- Categories and classification systems for clastic rocks
- To describe the models for key depositional environments of clastic rocks, including onshore river and desert settings, marginal marine beach and delta settings, and deep water submarine fan settings
- To distinguish the grain size characteristics of clastic deposits in different settings and describe the implications for reservoir quality and trends

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Tools and Techniques [GEO-GTT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course explains basic concepts of key tools and techniques used by geoscientists in the exploration and development of petroleum resources. Topics covered include seismic data, drilling and completions, and formation evaluation. The main points of horizontal drilling and hydraulic fracturing, which are widely used in developing unconventional resource plays, are presented. Also covered in This eLearning course is the estimation of reserves and resources.

Designed for

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

You will learn

- The basic concepts of 2D and 3D Seismic Data and how it is used to investigate the subsurface
- How seismic data is acquired, processed, and displayed for visualization and interpretation
- How to identify various types of drilling rigs and key pieces of equipment used in drilling, including bits and how they function
- How to understand the main points of the drilling process, including the basics of horizontal and directional drilling
- The basics of how a well is completed, including through hydraulic fracturing and other techniques of reservoir stimulation
- How rock and hydrocarbon information is gathered during the drilling of a well through mudlogging, coring, wireline logging, and testing
- To basic concepts of reserves and resource estimation
- How to use the volumetric method to estimate hydrocarbons in place

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Basic Petroleum Geology – Unconventional Petroleum Resources [GEO-UPR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course introduces the petroleum geology of Unconventional Resources, an increasingly important part of the oil and gas industry.

The first part of the eLearning course explains the basic concepts of unconventional resources and the key differences between conventional fields and unconventional resources. It describes the geology and technological factors controlling productivity for unconventional resources and discusses essential operational technologies, including horizontal drilling and multistage hydraulic fracturing.

To highlight and reinforce the basic concepts of unconventional shale resource plays, the second part of the eLearning course focuses on two case studies: first, the Eagle Ford Shale Play of southeast Texas and second, the Niobrara Shale Play of Colorado-Wyoming, as an example of a “shale hybrid play.”

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Explain what is meant by an Unconventional Resource and how it differs from a Conventional Field
- List the geologic factors controlling the productivity of unconventional resource plays
- Recognize the importance of geomechanical factors, in particular, stress field orientation
- Describe key aspects of horizontal drilling and hydraulic fracturing technologies as they relate to shale resource plays
- Explain the concept of a shale hybrid play
- Describe key technical developments that have led to increased productivity from shale plays and be cognizant of world oil and gas shale resource estimates

This eLearning course is included in the Basic Petroleum Geology eLearning series.

Interpreting Siliciclastic Environment of Deposition (EOD) for Deltaic Systems [GEO-ISE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course takes the participant through the concepts and general workflow of interpreting the environment of deposition (EOD) for siliciclastic deltaic systems using data sets including logs and seismic. The process of interpreting the EOD is one of integrating datasets of varying types, scales, and data density into a holistic understanding of a given stratigraphic interval. An EOD allows one to understand deposition at the field/reservoir scale and predict reservoirs at both the development and exploration scales. The concepts of facies, sequence stratigraphy, log and seismic correlation, depositional controls, and types of deltas are discussed and applied to example data sets from different deltaic systems in the eLearning course.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in petroleum exploration and production who needs to understand petroleum geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Understand and apply the process of interpreting a deltaic EOD
- Apply concepts and tools to datasets that are typically used for deltaic depositional environments
- Be familiar with typical EODs for different types of deltaic systems and understand their differences
- Apply tools and concepts for assessing the appropriateness of an EOD analog and modifying them to a specific deltaic system
- Apply concepts for developing a data collection strategy to improve the EOD

Introduction and Overview of Development Geology [GEO-IDG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces exploration, production cycles, and field development phases from discovery to abandonment.

Designed for

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

You will learn how to

- Describe the exploration/ production cycle and field development phases
- Explain how geologic properties impact field performance and reservoir energy
- Identify the reservoir characterization properties needed to predict field behavior and optimize field development
- Describe the evolution of reservoir description requirements as the field development matures

Introduction to Geosteering [GEO-IGE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces the skill sets needed to geosteer a directionally drilled (horizontal) wellbore, which is an increasingly important part of the oil and gas industry.

The eLearning course starts with a high-level discussion of both the benefits and the risks that geosteering presents to the development plan for the well, emphasizing the importance of proper communication between the disciplines. It then briefly reviews the variations in bottom hole assemblies used in directional drilling. Next, the mechanics of downhole surveys are discussed, and Logging While Drilling tools are discussed to reinforce learnings.

The second part of the eLearning course introduces azimuthal readings and the modeling of expected tool responses while drilling. Using an example well, participants will be introduced to: 'real time' logs, interpreting ahead, and the idea of target windows and target manipulation, all in the context of communicating responsibly with all stakeholders.

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and any team members involved in drilling a directional well who need to understand geosteering concepts at a basic level or communicate with others about it.

You will learn

- The benefits and risks involved in geosteering a directional well
- The components that make up a bottom hole assembly
- Key aspects of directional drilling and surveys
- Azimuthal tool readings and pre-drill modelling
- Real-time interpretation of log responses and target modification
- The importance of establishing and maintaining good communications with all stakeholders involved in the well

Introduction to Gridding for Computer-based Subsurface Mapping [GEO-IGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

In the modern petroleum industry, contour maps are generally derived from grids created in interpretation software packages. Maps, or the grids themselves, are used to evaluate prospectivity, estimate prospect volumes, pick drilling locations, and are the inputs for basin models, and static reservoir models. Despite the importance of these maps and the underlying grids, there is often a poor understanding of how the grids are generated and what the implications may be for the final map. This eLearning course introduces the gridding process and how manipulation of basic gridding parameters can produce maps that more closely reflect the underlying geology.

Designed for

Geoscientists, engineers, geoscience technicians, and anyone who needs to generate subsurface maps or understand how these maps are generated.

You will learn

- The importance of subsurface mapping.
  - How subsurface maps are used in the petroleum industry
  - Why mapping correctly matters
  - How mapping should be incorporated into an interpretation project
- The basics of contouring
  - Contouring rules
  - Different contouring styles
  - Practice contouring by hand
- The basics of gridding
  - What a grid is
  - Why grids are necessary
  - How gridding works
  - Geometric gridding parameters and their impact on the output grid, including increments, extents, and orientation
  - Grid search parameters and their impact on the output grid
    - Search radius/ellipse
    - Anisotropy (directional weighting)
  - Grid smoothing or filtering and its impact on the output grid
    - How, when, and why it may be applied
    - Common smoothing functions

Structural Interpretation Techniques and Concepts [GEO-STI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course introduces structural interpretation as the backbone for evaluating hydrocarbon resources and modeling basins. The eLearning course examines structural interpretation as fundamental to aspects of development including locating and scoping traps to tracking fluid-flow pathways for hydrocarbon migration through sequential restorations. By completing this eLearning course, learners will be able to recognize the sound application of interpretive methods to specific structures and features and identify areas where an approach or interpretation may miss the mark or merit reevaluation.

Designed for

Exploration geologists, geophysicists, engineers, and geoscience managers

You will learn

- Explore the concept of the “Structural Family”
- Engage three types of plate tectonic habitats: divergent boundaries, convergent boundaries and transform boundaries or margins
- Examine the faults and other characteristics associated with each habitat
- Identify key terms and concepts including structural inheritance and kinematic compatibility
- Explore the significance of elevation baselines in seismic interpretation
- Review key terminology and definitions regarding faults, including fault types and kinematics, and fault displacement components
- Practice measuring throw, heave, and net slip, and examine the relationships between them for different bed dips
- Examine key the concepts of balance and admissibility in cross-sections
- Recognize the characteristics that make cross-sections viable or valid
- Explore different kinematic models for restoration and when and why they apply

Compressional Tectonics Interpretation Fundamentals [GEP-COT-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	1.5 hrs

This eLearning course intends to explain the fundamentals of interpreting seismic data to those unfamiliar with this concept. We will examine the characteristics of compressional basins by examining their geology and geophysical signature.

Designed for

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

You will learn how to

- Recognize and interpret different styles of compressional features on seismic data
- Identify structural characteristics associated with compressional tectonics
- Interpret seismic data in compressional tectonics

This eLearning course is included in the Seismic Interpretation eLearning series.

Depth Conversion Fundamentals [GEP-DEC-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This eLearning course explains the fundamentals needed to convert time to depth in seismic interpretation.

Designed for

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

You will learn how to

- Identify the different types of velocities used to convert to depth
- Describe the factors that can affect depth conversion
- Recognize the skills needed to convert time to depth
  Explain how time-to-depth conversions are done on a workstation

This eLearning course is included in the Seismic Interpretation eLearning series.

Direct Hydrocarbon Indicators and Amplitude versus Offset [GEP-DHI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course explains that the effect of hydrocarbons as pore-filling material in our seismic data is at the heart of seismic interpretation. It also includes a section on rock physics. Amplitude variation with offset is used to modify risk in hydrocarbon prospects. This eLearning course introduces the technology's concept, process, and application.

Designed for

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

You will learn how to

- Explain the effect of hydrocarbons in the seismic data
- Detect hydrocarbons in the seismic data
- Describe rock physics
- Define amplitude variation with offset/angle (AVO/AVA)
- Make approximations to the Zoeppritz equations, including
  - Aki-Richards equation
  - Shuey's equation
- Identify the Rutherford and Williams classification
- Describe slope, intercept, and the fluid line
- Describe the methods for prestack inversion, including
  - Simultaneous Inversion;
  - Elastic Impedance and Extended Elastic Impedance;
- Lambda Rho and Mu Rho

This eLearning course is included in the Basic Geophysics eLearning series.

Extensional Basins Interpretation Fundamentals [GEP-EXB-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3.5 hrs

This eLearning course explains the fundamentals of interpreting seismic data to those unfamiliar with this concept. We will examine the characteristics of extensional basins by examining their geology and geophysical signature.

Designed for

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

You will learn how to

- Determine extensional basins in seismic data
- Associate structural and depositional characteristics with extensional basins
- Interpret seismic data in extensional basins

This eLearning course is included in the Seismic Interpretation eLearning series.

Seismic Acquisition, Processing, and Migration [GEP-SAP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course explains the seismic data acquisition process and marine and land data components. Also included is a comparison of the costs of seismic data acquisition for marine and land data. It also explains the concept of seismic processing flow and deconvolution. The eLearning course also explains what the processors do to produce the seismic image. Finally, we discuss the process of forming the seismic image by migration. There are several ways to migrate the data, including post-stack, pre-stack, time, and depth migration. For this eLearning course, Kirchhoff migration is used as a word picture for the process of allowing constructive and destructive interference to build the migrated image. Other methods will be discussed, along with their pros and cons.

Designed for

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

You will learn how to

- Describe the marine configuration for a 3D survey including:
  - Components used for data acquisition
  - Arrays to attenuate noise
  - Bin gathering as a CMP assemblage of reflections
- Describe the land configuration for a 3D survey including bin gathering for a land 3D survey
- Compare the costs of 2D and 3D surveys
- Describe processing flow
- Explain the concept of deconvolution
- Identify what the processors do to produce the seismic image

This eLearning course is included in the Basic Geophysics eLearning series.

Seismic Image and Geological Association with Seismic Reflections [GEP-SIG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course explains at the awareness level how to identify a seismic image and how it relates to geology. Also explained are how seismic images are formed and displayed, and the differences in analyzing seismic images in time and depth domains. This eLearning course is designed to explain the basics of the seismic process.

Designed for

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

You will learn how to

- Differentiate between depth and time
- Identify how a seismic image is displayed
- Describe how a seismic image is formed
- Identify a seismic image
- Explain how a seismic image relates to geology
- Changes in lithology
- Velocity and density
- The influence of porosity and pore filling material

This eLearning course is included in the Basic Geophysics eLearning series.

Seismic Interpretation Fundamentals
[GEP-SEI-1]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2.5 hrs

The intent of this eLearning course is to explain the fundamentals of interpreting reflection seismic data to those that are unfamiliar with this concept.

Designed for

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

You will learn how to

- Identify the skills needed to interpret seismic data
- Identify seismic reflectors and relate to the underlying geology
- Differentiate between faults and horizons on seismic data
- Identify the basics skills required in using workstations
- Display seismic data
- Differentiate between the contouring methods

This eLearning course is included in the Seismic Interpretation eLearning series.

Seismic Inversion and Attributes
[GEP-SIA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

What is done to the data is very simple, but the impact on our interpretation has become a huge issue. In this eLearning course, we learn to 'inverse' the seismic data into a rock property, specifically impedance. Also discussed are the types of inversion algorithms and their application.

Seismic data is typically not viewed in frequency or phase domain, but they are becoming popular displays. This eLearning course introduces the concept of attributes and explains what they are and how they are used to determine prospectivity of hydrocarbons.

Designed for

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

You will learn how to

- Explain the seismic inversion processes, both forward and inverse
- Identify relative and absolute impedance in seismic inversion
- Identify the inversion algorithms and their application
- Define attributes
- Identify the importance of attributes
- Describe spectral decomposition attributes
- Explain spectral notching
- Identify the concepts of attenuation and Q
- Describe the Hilbert Transform attributes
- List the multi-trace attributes
- Describe the coherency attribute
- Describe the curvature attribute
- Explain the application of self-organizing maps in predicting reservoir rock properties
- Identify the duplicity of attributes
- Relate how the application of attributes is far more important to know than the different types of attributes

This eLearning course is included in the Basic Geophysics eLearning series.

Seismic Mapping
[GEP-SEM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This interpretation exercise incorporates all aspects, from start to finish, in interpreting a 3D data set, including the final conversion to depth. Several discussion points on tying faults and the style of contouring are included.

Designed for

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

You will learn how to

- Identify the layout of a 3D seismic survey
- Turn the interpretation into a data reduction process resulting in an interpretation and a structural map originally in time

This eLearning course is included in the Basic Geophysics eLearning series.

Seismic for Unconventional Reservoirs
[GEP-SUR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course explains why unconventional reservoirs are becoming increasingly important and how we can use conventional geophysical tools for their analysis. We also learn that 'brittleness' is the most important rock physics property and how to perform seismic analysis for unconventional reservoir properties to contribute to sweet spot high grading. Finally, the eLearning course explains the concept of microseismic recording and microseismic monitoring and explains how the microseismic is interpreted using Hodograms in source orientation determination.

Designed for

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

You will learn how to

- Identify rock physics for shale reservoirs
- Describe seismic analysis for unconventional reservoirs
- Describe microseismic, including surface and subsurface recording arrays
- Describe source (event) recording and location detection
- Describe three component recording
- Identify the role of Hodograms in source orientation
- Identify the importance of microseismic monitoring in different stress areas

This eLearning course is included in the Basic Geophysics eLearning series.

Wavelets and Seismic Velocities
[GEP-WSV-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course explains why the vertical resolution of the seismic data is a critical issue and how the resolution is controlled by the propagating wavelet generated by the acquisition parameters. The eLearning course also discusses the recorded wavelet and its phases, as well as display polarity and display conventions. Also explained is how velocity can be estimated by the seismic image construction and used as an approximation to derive a depth converted geologic model from time imaged seismic or a depth image seismic. It covers how to directly measure depth versus vertical seismic travel time through Check Shot Surveys and Vertical Seismic Profiles and how vertical seismic profiling can be extended to 2, 3, and even 4 dimensions to tie the other direction of velocity to the seismic image.

Designed for

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

You will learn how to

- Identify why the vertical resolution of the seismic data is a critical issue
- Explain how the resolution is controlled by the propagating wavelet that is generated by the acquisition parameters
- Identify the recorded wavelet and its phase
- Describe the data display polarity and display conventions
- Identify seismic imaging velocities and how they are used to construct the seismic image
- Describe how imaging velocities are derived from the stacking process
- Describe velocity spectrum and how it applies to stacking and migrating the data
- Explain the relationship between depth and time and the ambiguity between the two domains
- Recognize overpressure in the seismic data
- Identify the jargon associated with anisotropy
- Recognize how a vertical seismic profile directly measures the time to depth relationship at various depths in a wellbore and how that facilitates tying it into seismic

This eLearning course is included in the Basic Geophysics eLearning series.

Characterization of In-situ Stresses [PPH-CIC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

One of the most important tasks in geomechanical characterization is finding different components of in-situ stresses, as discussed in this eLearning course.

Designed for

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

You will learn how to

- Identify the significance of in-situ stresses in subsurface operations with examples from different subsurface operations such as drilling, hydraulic fracturing, fluid production, and waste disposal
- Identify the in-situ stress components in the Earth and verify the validity of common approaches used to simplify the in-situ stress tensor
- Describe the difference between present-day and paleo stresses and explain how natural phenomena and subsurface operations can disturb in-situ stresses
- Calculate vertical stress (Sv) from density logs and quality control and re-build the density logs when necessary
- Explain and use different methods used for identifying horizontal stress orientation such as drilling indicators, sonic anisotropy analysis, seismology and microseismic data, natural fractures, geological indicators, lab and in-situ stress tests, etc.
- List different methods used for estimation/measurement of minimum in-situ stress (Sh_{min}) such as well tests such as mini-frac, extended leak-off test, DFIT
- Implement poroelastic modeling for estimation of the magnitudes of minimum and maximum horizontal stress (Sh_{min})

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Characterization of In-situ Stresses Fundamentals [PPH-CIF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5 hrs

This eLearning course continues from the basic-level Characterization of In-Situ Stresses eLearning course, focusing on determining maximum horizontal stress and using case studies to provide insights on the characterization of full stress tensors.

Designed for

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

You will learn how to

- Recognize the challenges of measurement of maximum horizontal stress (SH_{max}) and list the state-of-art methods for estimation of this in- situ stress component
- Explain and implement an integrated method for characterization of minimum and maximum horizontal stress (Sh_{min} and SH_{max}):
  - Frictional equilibrium
  - Reverse borehole stability using drilling experience and image logs
  - Poroelastic modeling
- Describe case studies for characterization of full stress tensor in well-, field-, and regional-scale (live session)

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Core Analysis Knowledge [PPH-CAC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces the purpose of, processes, and tools for basic core measurements and special core measurements, and overviews Petrography and Mineralogy Data from cores as well as unconventional core analysis.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communication between the subsurface team and everyone in the E&P industry, including service company and government employees.

You will learn how to

- Outline techniques for measurement of porosity, permeability, and saturation from cores
- Identify rules for cutting core plugs, cleaning, and preparing
- Define special core analysis and its application to petrophysics
- Explain the usage of special core analysis to determine electrical properties (m, n, Qv) and procedures to assure quality
- Describe the importance of capillary pressure and wettability; how special core analysis can determine relative permeability curves and residual saturations
- Explain basic concepts of thin section, SEM, and X-ray diffraction
- Describe scanning electron microscopy's purpose
- Define terms of core analysis, the mineralogy of the rocks, and differences when taking measurements
- Identify differences between unconventional and routine measurements and know when to apply each
- Define TOC, Maturity, and Kerogen type of source rocks

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Formation Testing
[PPH-FTC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course is designed to teach the fundamental aspects of formation testing; increase familiarity with basic formation testing applications; increase understanding of the objectives, techniques, and equipment associated with reservoir fluid sampling; and explicate the role formation testing plays in assessing formation producibility.

Designed for

Production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geoscientists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn

- The basics of formation testing, including important terms and concepts
- The specifics of formation testing applications
- How reservoir fluid sampling is conducted
- The role of formation testing for producibility

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Gamma Ray and Spontaneous Potential Logging
[PPH-GRS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course is an introduction to Petrophysical well logging tools and data interpretation. Topics include the Gamma Ray (GR) Log and the Spontaneous Potential (SP) log. The material presented is at the awareness competency knowledge level.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn

- The physics and applications of Gamma Ray and Spontaneous Potential log data
- Concepts of openhole logging in vertical and horizontal wells
- Gamma Ray logging tool function and applications
- Spontaneous Potential logging tool function and applications

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Introduction and Overview of Petrophysics
[PPH-IOP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course introduces key concepts in petrophysics and provides an overview of how petrophysics is used in a variety of E & P applications. Topics include types of well data and data gathering, such as mud logs, MWD/LWD logs, wireline logging, coring, and analysis. This eLearning course explains how common logging tools work and how they are used. Various petrophysical workflows are reviewed that integrate petrophysical data for common applications, including volumetric assessments. The knowledge gained in This eLearning course will give you the ability to comfortably work through complex datasets in many petrophysics topics.

Designed for

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

You will learn how to

- Describe petrophysics and explain petrophysical applications in other subsurface specialties (Geology, Geophysics, Reservoir Engineering, Drilling Engineering)
- List and describe important petrophysical properties
- Explain the collection, types, and applications of petrophysical data including
  - Mud logging
  - Measurement while drilling (MWD)
  - Logging while drilling (LWD) and wireline logging, including differences and similarities
  - Core sampling, including the advantages and disadvantages of different types of sampling
  - Routine core analysis (RTA) and special core analysis (SCAL)
  - Fluid sampling and pressure data (wireline)
- Define petrophysical rock types and describe the basic relationships between petrophysical properties and depositional environment
- Define and describe the methodology of determining net sand, net pay, and water saturation for volumetric calculations

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Introduction to Reservoir Geomechanics and its Application [PPH-IPG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This introductory eLearning course is designed to familiarize the learners with reservoir geomechanics, its fundamentals, and terminology, along with exploring methodologies used for solving problems associated with different subsurface operations.

Designed for

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

You will learn how to

- Recognize the significance of rock mechanics and petroleum geomechanics in development of hydrocarbon resources and other subsurface operations
- Identify applications of geomechanics for optimization and risk mitigation for several different subsurface operations
- Use the basic terminology of petroleum geomechanics e.g., in-situ stresses, pore pressure, failure criteria, constitutive models, fracture networks, and several other terms
- Describe the basic principles of rock mechanics and its problem-solving techniques for different geomechanical problems such as borehole stability, sand production, compaction, and subsidence, caprock integrity, hydraulic fracturing, and more

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Introduction to the Petrophysical Interpretation for Unconventional Reservoirs [PPH-IUR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces the Petrophysical Interpretation of Unconventional Reservoirs. Sources of information for reservoir description are covered and include hydrocarbon generation as a function of temperature and composition, wellsite data, coring, core analysis, well logs, and dynamic testing. Organic-rich shales can be naturally enhanced beyond the initial porosity and permeability. Methods of enhancement and examples are provided.

Designed for

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

You will learn to

- Important geochemical concepts of organic-rich shales
- Wellsite information, coring and analysis, and well logging data application for shale reservoir evaluation
- Recognition of organic-rich shale with log responses
- Shales pore systems and contrasts with conventional reservoir systems
- A volumetric workflow
- Ways in which organic-rich shale porosity and permeability can be enhanced beyond the intrinsic matrix porosity and permeability
- Method for obtaining pressure and mobility on wireline
- Drilling and completion applications of geomechanical properties

Laboratory Measurements of Rock Mechanical Properties [PPH-LMB-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

Laboratory testing is considered one of the most reliable sources for characterization of mechanical rock properties. This eLearning course provides a profound understanding of the laboratory tests commonly conducted in the practice of petroleum geomechanics. It explains how to efficiently understand, interpret, and use the results of these tests in geomechanical workflows.

Designed for

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

You will learn how to

- List different data sources for geomechanical characterization
- Identify different groups of laboratory tests and their differences
- Recognize the limitations and challenges of laboratory sampling and testing
- Identify the importance of compressive laboratory tests; describe unconfined and confined compressive tests and their procedures
- Determine shear failure criteria from the results of compressive laboratory tests and identify the limitations of conventional triaxial apparatus
- Describe the procedure for conducting other compressive testing apparatuses such as true triaxial and direct shear tests
- Recognize the importance of characterizing tensile strength of rocks and describe the methods used for its measurement.
- Define fracture toughness, recognize its importance, and describe different methods used for the measurement of fracture roughness
- Recognize the influence of rock anisotropy on the results of compressive and tensile laboratory tests

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Laboratory and Field Measurement of Special Rock Mechanical Properties [PPH-LFM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

While conventional laboratory tests provide important basic data, proper geomechanical characterization of rock properties require acquisition of important data from several other sources such as special laboratory tests and field measurements. This eLearning course introduces these data sources and explains their values and applications for geomechanical characterization.

Designed for

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

You will learn how to

- Recognize the importance of compressibility tests in reservoir geomechanics and identify different types of compressibility coefficients
- Describe procedures of hydrostatic and uniaxial compressibility tests in drained and undrained conditions
- Recognize the influences of (cyclic) production and injection on the mechanical response of rocks
- List the reasons for conducting non-destructive tests and the procedures for some major non-destructive tests including rebound hammer, indentation and scratch tests, and list their limitations
- Explain the differences between dynamic and static measurements of elastic rock properties and recognize the importance of comparing static and dynamic elastic properties
- Describe the procedure for the ultrasonic test and calculate dynamic rock properties from the results of this test
- Recognize the influence of rock anisotropy on the results of ultrasonic tests
- Explain how acoustic emission measurements can help with the characterization of failure in rocks
- List different field measurement methods that can be used for the characterization of mechanical rock properties, such as wireline logs, seismic surveys, seismic and micro-seismic monitoring, and mechanical field tests

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Mud Logging, Coring, and Cased Hole Logging [PPH-MLC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course continues the introduction to a specialized area of E&P called petrophysics. The field operations and technologies required to identify and quantify oil and gas resources are introduced. Topics include mud logging, coring, and cased hole logging. The material presented is at the awareness competency level.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn

- About acquiring and interpreting mud log data including gas detection and drill cuttings examination to identify prospective oil and gas zones
- How representative rock samples are obtained with coring methods including whole cores and sidewall samples
- The basics of cased hole logging for reservoir monitoring, production logging, and wellbore integrity

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Overview of Petrophysical Interpretation [PPH-OPI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course provides an overview of petrophysical interpretations focused on conventional reservoirs. It introduces the goals and data sources of petrophysical interpretation and details the data quality and conditioning processes that are essential to producing reliable interpretations to inform asset development.

Designed for

The content is suitable to anyone wanting to understand the bases for subsurface resource interpretation of conventional reservoirs. Previous exposure to subsurface terminology and concepts is assumed.

You will learn how to

- How petrophysical interpretations address and measure the geochemical properties of conventional reservoirs linked to the goals of specific projects
- Data sources of petrophysical studies – including why data quality is a perennial concern and how it can be addressed
- Common workflows for petrophysical interpretation and the purposes and features of each
- How volumetric interpretations are formed from petrophysical measurements
- How fluid flow is measured as the basis of dynamic interpretations
- Petrophysical approaches for addressing and quantifying uncertainty

Petrophysical Evaluation [PPH-PEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course is an introduction to Petrophysical Evaluation which integrates the concepts and data covered in the previous eLearning courses. The porosity and resistivity data are used in the saturation model to calculate oil and gas saturations. By integrating the available mudlog, and open hole log data, the Petrophysicist determines net pay, net to gross, porosity, and hydrocarbon saturations. These are required inputs to the Geologic (Static) model used to calculate hydrocarbon volumes in the subsurface. Also, the petrophysical evaluation data including permeability is required input into the reservoir dynamic model that is used to plan development wells and facilities and optimize production of oil and gas reservoirs.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn

- How to perform a basic petrophysical evaluation that incorporates Gamma Ray, SP, porosity, and resistivity data
- About the borehole and formation environment and the parameters required for saturation determination
- About the Archie Equations and how to calculate water saturations in any interval of interest
- About the effect of clay minerals on formation resistivity
- About the shaly sand equations used to calculate saturations in shaly sands
- About how to conduct an integrated formation evaluation

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Pore Pressure Measurement and Prediction [PPH-PPM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

Pore pressure is a critical parameter for geomechanical modeling, and its proper characterization has a great importance as will be discussed in this eLearning course.

Designed for

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

You will learn how to

- Identify the significance of pore pressure in subsurface operations such as drilling, completion, production, etc.
- Define pore pressure in porous rock and describe the mechanical interaction between the rock matrix and fluid and explain the concept of effective stresses
- List different pore pressure regimes and explain their differences
- Recognize and explain different mechanisms that result in overpressure regimes including stress-induced, uplift, buoyancy and pressure difference, and fluid generation and fluid expansion mechanisms
- Identify and describe natural and artificial mechanisms that result in underpressure regimes
- List different methods used for pressure detection and prediction including pre-drilling, while-drilling, and after-drilling methods
- Describe the fundamentals of pore pressure measurement using well testing
- Recognize the influence of pore pressure on different rock properties, petrophysical logs and seismic attributes that can be implemented for identifying overpressuring
- Explain the influence of high pore pressure on different rock properties such as porosity, density, wave velocities, and resistivity
- Explain basic equivalent depth and ratio methods to estimate overpressuring from petrophysical logs
- Explain how drilling indicators (e.g., kicks, tight spots, gas shows, etc.), rock cavings and drilling rate are used for estimation of pore pressure
- Explain the challenges of pore pressure prediction in unconventional plays

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Porosity Logging (Density, Neutron and Sonic) [PPH-PLC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course continues the introduction to petrophysical well logging tools and data interpretation. Topics include density, neutron, and sonic “porosity” logs. The material presented is at the awareness competency level.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn

- The tool physics and data applications of the primary porosity well logs including the Density, Neutron, and Sonic Logs

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Resistivity Logging Tools and Interpretation [PPH-RLT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course continues the introduction to petrophysical well logging tools and data interpretation. It covers resistivity logging tools, including Induction logs, Laterologs, EWR tools, and microresistivity devices, as well as resistivity data. Topics include depth of investigation and bed resolution, types of resistivity logs, and the effects of different mud systems.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn

- Operating tool physics and data applications of the various resistivity logging tools
- Selection criteria for which tool provides the best resistivity data for different environments (mud types, formation resistivity ranges, etc.)
- The latest Array resistivity tools
- The transverse induction device for highly anisotropic formations
- The Resistivity Logging Tools – Old Electric Logs
- Depth of investigation and bed resolution
- Induction Logs
- Laterologs
- Microresistivity Logs

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Rock Mechanics [PPH-FRM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course reviews the essentials of rock mechanics required for the general practice of petroleum geomechanics and covers basic concepts such as stress, deformation, and failure in rocks.

Designed for

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

You will learn how to

- Identify three main constituents of geomechanical problems: initial state, disturbing events, and mechanical response in different geomechanical problems
- Define stress tensor, effective stresses, principal stresses, in-situ stress regimes, and visual stresses in the Mohrs coordinate system
- Recognize the significance of deformation in rock mechanics and define strain tensor and different types of strains
- Describe elastic and elastoplastic constitutive models between stress and strain tensors such elastic and elastoplastic and their parameters
- Calculate dynamic elastic parameters and identify the differences between dynamic and static elastic parameters
- Recognize the importance of shear failure criteria in geomechanics and describe different linear and non-linear failure criteria and their advantages and limitations
- Read and use laboratory reports for measurement of elastic parameters and strength properties of rocks

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Rock Mechanics for Shale Plays [PPH-RMS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

Special mechanical properties of shales, such as anisotropy, brittleness, and fracture toughness, are crucial for the development of shale plays, as this eLearning course will discuss.

Designed for

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

You will learn to

- Identify mechanical anisotropy and its different types and its measurements from lab, log, and seismic data
- Recognize how anisotropy influences the rock response to hydraulic fracturing
- Identify the different types of rock brittleness (elastic, mineralogical, and strength-based)
- Describe fracture toughness and its measurement

This eLearning course is included in the Introduction to Geomechanics for Unconventional Reservoirs eLearning series.

Special Petrophysical Tools: NMR and Image Logs [PPH-SPT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course introduces Nuclear Magnetic Resonance (NMR) logging, interpretation of borehole images and dip meter data, and how permeability is measured in both logs and cores. The eLearning course covers NMR logging principles and interpretation and the importance and application of borehole image and dipmeter data.

Designed for

Geoscientists and engineers with less than twelve months of experience using petrophysical data, Ideal for other technical staff and non-technical staff (e.g., management, drilling operations, technical support staff, finance, legal, IT, supply chain management, and others) at all experience levels wanting a basic background in the petrophysics discipline. This eLearning course lays the foundation for effective communications between the Subsurface Team and everyone in the E&P Industry including Service Company and Government employees.

You will learn how to

- Describe NMR principles: proton recession and T1 and T2 relaxation in porous media
- Describe the NMR response to pore size, free fluid, trapped water, permeability, and water cut
- Characterize tool models, similarities, differences, and operational issues
- Define NMR permeability determination and bound water versus free water
- Describe NMR saturation techniques and interpretation, including appropriate applications and limitations
- Determine permeability from conventional wireline logs
- Estimate permeability from empirical relationships
- Apply specialized tools, such as NMR and acoustic logs to estimate permeability
- Determine permeability from cores

This eLearning course is included in the Foundations of Petrophysics eLearning series.

Decline Curve Analysis and Empirical Approaches [RES-RSA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course introduces the use of statistical methods in reservoir engineering. A range of applications are described, concentrating on decline curve analysis.

Designed for

Reservoir engineers, and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Perform basic statistics
- Calculate decline curve analysis
- Estimate recovery factors

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering

Decline Curve Analysis and Empirical Approaches Fundamentals [RES-RSA-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10.5 hrs

This eLearning course applies basic statistical methods to solve a range of common challenges in reservoir engineering. The emphasis will be on decline curve analysis and curve fitting to measured data such as relative permeability, as an example.

Designed for

Reservoir engineers and other professionals tasked with performing basic reservoir engineering functions.

You will learn

- Exponential, Hyperbolic, and Harmonic decline curve application
- Transient versus Pseudosteady State declines
- Effect of crossflow on the performance of layered reservoirs
- Using water-cuts, oil cuts, and water-oil ratios to calculate oil recovery
- Special considerations for gas reservoirs
- Decline curves for low permeability reservoirs
- Variation on the least-squares methods for curve fitting
- Common pitfalls for decline curve analysis

Suggested prerequisite

- Decline Curve Analysis and Empirical Approaches [RES-RSA-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Enhanced Oil Recovery [RES-EOR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.3 hrs

This eLearning course introduces secondary and tertiary recovery processes. It describes how many of them work, how you can select the best one for your reservoir, and how simplified models can be used to approximate the behavior of these complex floods.

Designed for

Engineers or Geoscientists who will be working with a reservoir engineer on the development and optimization of oil and gas fields. Reservoir engineers looking for an introduction or a refresher on enhanced oil recovery.

You will learn

- The differences between secondary and tertiary recovery
- The comparisons between pattern and peripheral flooding
- The life stages of a waterflood
- The differences between miscible, thermal, and chemical floods
- Screening criteria for different floods
- Rules of thumb for predicting performance
- Simplified models for predicting performance

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering

Improved Oil Recovery Fundamentals
[RES-IOR-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

This eLearning course discusses the reservoir aspects of waterflooding. It builds on the related topics from earlier eLearning courses and “fills in the blanks”. Reservoir surveillance and reservoir management activities specific to waterfloods are covered and the balance left to later eLearning courses to avoid duplication.

Designed for

Engineers or Geoscientists who will be working with a reservoir engineer on the development and optimization of oil and gas fields. Reservoir engineers looking for an introduction or a refresher on enhanced oil recovery.

You will learn

- Waterflood Types
  - Peripheral versus Pattern
  - Above versus Below Bubble Point Pressure
  - Above versus Below Fracture Pressure
  - High versus Low Reserves to Producing ratios
  - Normal versus Enhanced
  - Onshore versus Offshore
- Waterflood Operations
  - Modeling the Reservoir
  - Monitoring Injectors
  - Monitoring Patterns
  - Water Quality

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Introduction to Unconventional Reservoirs
[RES-IUR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course introduces the Unconventional Reservoir Engineering set of eLearning courses. In this eLearning course, the basic terminology of all the disciplines is introduced and the fundamental reservoir characterization techniques are discussed. Also covered are the basics of reservoir management and integrated teamwork and how they are essential to proper field development.

Designed for

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types.

You will learn

- What types of unconventional reservoirs exist
- How they are different from conventional reservoirs
- How the geologic characterization is different from conventional reservoirs
- How reservoir management is different from conventional reservoirs
- How reservoir enhancement is different from conventional reservoirs
- How reservoir surveillance is different from conventional reservoirs
- How reservoir evaluation is different from conventional reservoirs
- What constitutes a “sweet spot” in unconventional reservoirs

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Pressure Transient Analysis
[RES-PTA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course brings your attention to pressure transient analysis concepts, equations, and terminology. These will get you started in the process of understanding and using this key technology for understanding oil and gas reservoir architecture and near-well parameters.

Designed for

Reservoir Engineers, and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn

- Pressure transient analysis concepts, terminology, equations, and objectives
- Pressure transient analysis in buildup and drawdown tests
- Time period analysis, challenges and objectives
- Semi-log and log-log analysis

This eLearning course is included in these eLearning series:
- Applied Reservoir Engineering
- Basic Reservoir Engineering

Producing versus Injecting Wells Fundamentals [RES-PVI-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

In this eLearning course, we construct single-well models of both injectors and producers, describe their applications to waterflooding, and discuss their limitations.

Designed for

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

You will learn how to

- Estimate the performance of an injection well using analytical methods
- Estimate the performance of an injection well using numerical methods
- Explain the advantages of modeling producing wells together with injection wells
- Compare injection above and below the oil-water contact
- Compare injection above and below bubble point
- Compare injection through vertical and horizontal wells
- Compare injection through hydraulically fractured wells
- Discuss the merits of partial perforation versus full perforation
- Explore perforation strategy differences between injection and producing wells
- Compare and contrast multiple methods of water shut-off in both injection and producing wells
- Compare and contrast multiple artificial lift methods for producing high water-cut wells
- Discuss the advantages and disadvantages of hydraulically fracturing injection and/or producing wells
- Discuss the advantages and disadvantages of gravel-packing injection and/or producing wells
- Calculate the optimal ratio of producing to injecting wells for a waterflood
- Discuss the merits of dry tree versus subsea wells for a waterflood

This eLearning course is included in the Waterflooding A to Z eLearning series.

Rate Transient Analysis [RES-RTA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course covers five sections that include the general introduction to rate transient analysis, traditional decline curve analysis, modern rate transient analysis, unconventional reservoirs, and integration of material balance.

Designed for

Reservoir Engineers, and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Define the rate time analysis
- Distinguish between traditional pressure transient analysis and rate time analysis
- Describe the needs of the type of data which are typically used for rate time analysis
- Discuss the application of rate time analysis under transient and pseudo-steady state conditions
- Distinguish between the type of reservoir information we can obtain under transient and pseudo-steady state conditions
- Explain the use of dimensionless variables in rate time analysis
- Distinguish between exponential, harmonic, and hyperbolic decline curves
- Explain the different parameters that impact the performance of a well
- Describe how the Economic Ultimate Recovery (EUR) is impacted by the assumptions about the type of decline method
- Identify different flow regimes that are present for multiple fractured, horizontal wells
- Indicate important flow regimes which are typically observed in horizontal, multi-stage, fractured wells
- Determine the type of reservoir parameters we can obtain from evaluating rate time data for unconventional formations
- Indicate how the traditional decline curve analysis can be used for wells producing from unconventional reservoirs
- Describe the relationship between material balance and rate time analysis
- Explain how to combine material balance with rate equations to predict rate as a function of time
- Describe simple cases for single phase gas and oil reservoirs and predict the rates
- Indicate how the simple analysis can be extended to other complex situation

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering
- Unconventional Reservoir Geoscience and Engineering

Reserves and Resources [RES-RRC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course brings your attention to reserves management and the difference between resources and reserves at an awareness competency level.

Designed for

Reservoir Engineers, and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn

- The importance of integration with other disciplines
- Calculations using the volumetric formulas for gas and oil
- The importance of dividing into flow units for dynamic reserves in reservoir simulation
- Reserves management: what it is and how to do it
- The Reservoir Engineer's input to reserves and resources (R & R)
- How a Geoscientist and Reservoir Engineer work together on reserves
- The risk and uncertainty that drive reserves
- Other non-technical factors that influence R & R
- The standardized process between reserve estimates
- The ethical basis underlying R & R estimations

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering

Reservoir Flow Properties [RES-RFP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course discusses the extensions and limitations of Darcy's Law. This eLearning course also includes the application of Darcy's Law to gas an oil and how the law can be applied to homogenize to calculate effective permeability.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Explain the origin of Darcy's law and how it evolved
- State the difference between gravity and the pressure gradients, and how they play a role in determining the rate of which fluid could flow in the porous medium
- Identify the differences between the equations of Linear versus radial flow when calculating the flow
- Explain how heterogeneities affect the flow in porous medium, and how Darcy's law can be applied to homogenize to calculate effective permeability
- Differentiate between oil and gas flow
- Apply Darcy's law to gas and oil
- Calculate the amount of fluid that is flowing when you have single cell phase vs single phase oil
- Describe the Importance of non-Darcy effect on well performance
- Apply Darcy's law when calculating the rate of the of oil and gas well
- Identify the differences between layers in parallel and layers in series
- Discuss the effective permeability of both layers in parallel and layers in series
- State limitations of Darcy's law
- Assess the differences between gas and oil reservoirs
- Describe the effect of non-Darcy flow

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering

Reservoir Flow Properties Fundamentals [RES-RFP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9 hrs

This eLearning course covers multiple basic and advanced levels of topics. The topics include but are not limited to darcy's law, flow regimes, fractured wells, and heterogeneous systems and skin factor.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Apply Darcy's law for radial flows
- Differentiate between oil and gas flows
- Solve simple problems for radial flow across porous medium
- Define and calculate productivity index
- Understand the application of both pseudo-real pressure and pressure squared methods for gas wells in calculating the rates
- Evaluate the end of transient and the beginning of pseudo-steady state flows for circular as well as non-circular reservoirs
- Understand the importance of vertically fractured and horizontal wells
- Calculate the rates and productivity indices for vertically fractured and horizontal wells using the concept of effective wellbore radius
- Understand different flow regimes encountered by vertically fractured and horizontal wells
- Evaluate efficacy of horizontal wells and compare the performance to vertically fractured wells
- Evaluate the performance of a well in the presence of skin factor
- Evaluate the performance of the well with limited amount of production data
- Understand the conditions which non-Darcy flow is important
- Evaluate the performance of gas wells in the presence of non-Darcy flow using both pressure squared and pseudo-pressure equations
- Understand the concept multi-rate test and why it is important
- Evaluate the oil well performance when the well is producing below bubble point
- Analyze and solve basic and advanced level problems

Suggested prerequisite

- Reservoir Flow Properties [RES-RFP-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Fluid [RES-RRC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course reviews fluid properties at the awareness competency level.

Designed for

Reservoir, production, and facilities engineers who have a need to model the flow of oil, gas, and water through reservoirs, wellbores, and surface facilities; geoscientists who need reservoir fluid properties for their interpretations and calculations.

You will learn how to

- Describe how fluids change in response to changes in pressure and temperature
- Define the engineering properties of reservoir fluids
- Describe the make-up of reservoir fluids
- Describe how fluids are sampled
- Describe how fluid properties are measured in the laboratory

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering
- Unconventional Reservoir Geoscience and Engineering

Reservoir Fluid Fundamentals [RES-RFF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10 hrs

This eLearning course explores the calculation of fluid properties such as formation volume factors, viscosities, and densities for a wide range of fluids under reservoir conditions.

Designed for

Reservoir, production, and facilities engineers who have a need to model the flow of oil, gas, and water through reservoirs, wellbores, and surface facilities; geoscientists who need reservoir fluid properties for their interpretations and calculations.

You will learn

- Volumetrics
- Material Balance
- Fluid Flow using Darcy's Law
- Pressure Transient Analysis
- Rate Transient Analysis
- Fluid Displacement
- Many other types of analysis

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Fluid Displacement [RES-RFD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course covers immiscible, linear displacement as dispersed and segregated flow. It also discusses aquifers, coning, and vertical layering.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn

- Fluid displacement as immiscible, linear, and vertical (overcoming gravity)
- Dispersed and segregated flow
- Aquifers models
- Coning in oil/water systems, including when it is most likely to occur, and how to prevent it

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering

Reservoir Fluid Displacement Fundamentals [RES-RFD-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10.5 hrs

This eLearning course expands on the topics covered in Reservoir Fluid Displacement:

- Immiscible, linear displacement as dispersed and segregated flow
- Aquifers
- Coning
- Vertical layering

Designed for

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

You will learn how to

- Calculate the breakthrough time for an oil well using a collection of different methods
- Explain how rock and fluid properties as well as reservoir geometry affect the breakthrough time
- Model the flow of two fluids concurrently through the same rock volume
- Recognize how flow rates and pressure drops vary under two phase flow
- Calculate recovery factors for reservoirs experiencing two phase flow as a function of time
- Use correlations to estimate areal and vertical sweep efficiency
- Calculate water influx into hydrocarbon reservoirs using a variety of aquifer models
- Recognize the strengths and weaknesses of popular aquifer models

Suggested prerequisite

- Reservoir Fluid Displacement [RES-RFD-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Management
[RES-RMC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	6 hrs

This eLearning course brings your attention to reservoir management (RM) at an awareness competency level.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Retain flexibility in RM without giving up key principles for depletion
- Build flow units critical to RM of an asset
- Describe how the value of an asset is defined; Explain the roles of risk and uncertainty in that valuation
- Evaluate vertical equilibrium and no-crossflow and how to get the most out of each through integrated technologies from multiple disciplines

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Management Fundamentals
[RES-RMF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8.5 hrs

This eLearning course covers more advanced treatment of reservoir management principles. We look more thoroughly at special reservoir situations. We will also deal specifically with your own reservoir management asset issues in this eLearning course.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Manage reservoir management uncertainties throughout phases of field maturity
- Identify the geologic and reservoir parameters that make an opportunity and then the capture techniques to the particularities of that opportunity
- Conduct analysis to determine the most appropriate injectant including EOR techniques (if any) for a particular reservoir situation
- Apply the appropriate well architecture(s) or combination of well architectures to match the combined geology and reservoir drive mechanism
- Adjust and adapt the reservoir management plan for each new phase of field life

Suggested prerequisite

- Reservoir Management [RES-RMC-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Material Balance
[RES-RMB-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course covers the basics of material balance. The topics included are drive mechanisms, principles of material balance, how to develop equations, and application of the material balance equation.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Describe the purpose of the material balance technique to estimate the initial hydrocarbons in place
- Differentiate between volumetric analysis and material balance technique
- State the basic principle of material balance analysis
- Describe the principles behind material balance equation
- Identify the data that is needed to apply the material balance equation and the uncertainties associated with collecting such data
- Identify the purpose of the modified black oil model in material balance equation
- State the assumptions involved in applying the material balance equation
- Identify the limitations of material balance technique
- Develop the material balance equations from the first principle
- Identify and explain the different mechanisms influencing the production of hydrocarbons and how they are incorporated in the material balance equation
- Understand the necessary equations to be used depending on the type of reservoir from which hydrocarbons produce
- Develop appropriate equations for dry gas, wet gas, condensate, volatile oil, and black oil reservoirs
- Describe modifications of material balance equations to estimate the initial oil and gas in place
- Explain the Havlena and Odeh method and the appropriate way to linearize the material balance equations
- Express the importance of water influx and how to detect the presence of aquifer based on production data
- Recognize the uncertainties associated with predicting the water influx as a function of time

This eLearning course is included in these eLearning series:
- Applied Reservoir Engineering
- Basic Reservoir Engineering

Reservoir Material Balance Fundamentals [RES-RMB-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	7.5 hrs

This eLearning course reviews and expands on the basic Reservoir Material Balance eLearning course. Included is a detailed review of dry and wet gas reservoirs, black oil reservoir, volatile oil and retrograde condensate reservoir, and water influx.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- Discuss the basic material balance equation and assumptions
- Understand how the equations can be simplified based on certain assumptions and importance of mechanisms
- Relate material balance equation to different types of reservoirs
- Understand the application of material balance equation for gas reservoirs
- Consider the simplifications of material balance equation for absence or presence of different mechanisms
- Evaluate the uncertainties associated with mischaracterization of different mechanisms
- Apply various straight line manipulations for determining the gas in place for gas reservoirs
- Understand important drive mechanisms for black oil reservoirs
- Estimate the oil in place in oil reservoirs when the reservoir is above bubble point, producing below bubble point, influenced by gas cap
- Quantify the uncertainties in oil place based on the assumptions in the strength of drive mechanisms
- Quantify the uncertainties in oil place based on the assumptions in the strength of drive mechanisms
- Understand the importance of water influx in the material balance calculations
- Learn how to estimate the water influx using pot aquifer as well as pseudo-steady state methods
- Understand trial and error procedure required to estimate the aquifer influx
- Recognize the uncertainties associated with the estimation of aquifer size and the strength

Suggested prerequisite

- Reservoir Material Balance [RES-RMB-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Rock Properties [RES-RRP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course reviews the properties of reservoir rocks at the awareness level.

Designed for

Reservoir engineers and geoscientists who need reconcile rock properties with their interpretations of the properties of the reservoir, drilling, production and completion engineers who need to recognize how rock properties affect their respective workflows.

You will learn

- Different types of rocks
- Primary rock properties from a reservoir engineering point of view
- How rock properties are measured
- How rock property values are interpolated/extrapolated throughout the reservoir

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering
- Unconventional Reservoir Geoscience and Engineering

Reservoir Rock Properties Fundamentals [RES-RRP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8 hrs

This eLearning course introduces the concepts of wettability, capillary pressure, and relative permeability, and discusses how they are measured and modeled for reservoir behavior description.

Designed for

Engineers and Geoscientists who need to understand how fluids compete for space in the reservoir.

You will learn how to

- Describe the concept of fluid contacts
- Describe how saturations change when crossing contacts
- Describe wettability
- Describe interfacial tension
- Describe how residual oil saturation is controlled by the interplay of different forces
- Define capillary pressure
- Explain how capillary pressure is a combination of several related phenomena
- Describe how capillary pressure can be used to explain macroscopic reservoir phenomena
- Show how collecting capillary pressure data can actually save money
- Discuss the various choices available for measuring relative permeability in the laboratory
- Discuss the various choices available for measuring capillary pressure in the laboratory
- Show how reservoir engineers model relative permeability
- Show how reservoir engineers model capillary pressure
- Describe how reservoir engineers define saturations
- Apply concepts discussed in the eLearning course to build relative permeability and capillary data datasets

Suggested prerequisite

- Reservoir Rock Properties [RES-RRP-1]

This eLearning course is included in these eLearning series:

- Applied Reservoir Engineering
- Basic Reservoir Engineering
- Unconventional Reservoir Geoscience and Engineering

Reservoir Simulation
[RES-RSI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course describes how reservoir simulations are used, what goes into them, how they do their calculations, and what comes out of them.

Designed for

Engineers and Geoscientists who interact with reservoir simulation specialists need to evaluate the value of these models to the enterprise.

You will learn how to

- Describe what kind of data is used by a simulation run
- Describe the kinds of information that can be generated from a simulation run
- Explain, at a high level, how reservoir simulators work
- Describe how simulation models differ during the life of the reservoir
- Describe how models are classified, based on:
  - The type of input data used
  - The question the model was designed to answer

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Surveillance
[RES-RSC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	6.5 hrs

This eLearning course brings your attention to reservoir surveillance (RS) objectives, activities, and plans and the link to uncertainty.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn

- A surveillance plan's objectives must be aligned with asset specific tactical details
- Surveillance activities must add value and they do not after reaching a certain optimum
- How to calculate the Value of Information derived from surveillance activities
- How surveillance activities reduce uncertainty
- The surveillance plan must change constantly as asset objectives change
- The impact of the production and well environment, including well construction concepts and how this impacts RS activities
- How production allocation impacts the quality of the data and the impact of data frequency
- Measurement principles behind oil field measurements, including concepts related to precision, accuracy, and repeatability

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Reservoir Surveillance Fundamentals
[RES-RSF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

This eLearning course continues the discussion on reservoir surveillance (RS), with a focus on quality control for baseline and episodic data, data analytics, special techniques, and life of field reservoir surveillance.

Designed for

Reservoir Engineers and other professionals tasked with supplying reservoir description and production data to reservoir engineers.

You will learn how to

- QA/QC baseline and episodic data
- Use data analytics at various scales and from laboratory to the field
- Evaluate special techniques for application in your reservoir
- Prepare your reservoir for life of field reservoir surveillance through observed case studies

Suggested prerequisite

- Reservoir Surveillance [RES-RSC-1]

This eLearning course is included in the Applied Reservoir Engineering eLearning series.

Unconventional Reservoir Analysis
[RES-URA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, you will learn the fundamental ways that various well tests and production analyses are applied to unconventional reservoirs. Diagnostic Fracture Injection Tests (DFITs), Diagnostic Plots, Rate Transient Analysis (RTA), Decline Curve Analysis (DCA) are all historic production rate and pressure analysis tools that are being applied to unconventional reservoirs. The fundamental principles will be reviewed before the application skills are covered in the Unconventional Reservoir Analysis Fundamentals eLearning course. Additionally, the fundamental principles of reserves and resource management will be covered.

Designed for

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types.

You will learn

- What a DFIT, RTA, DCA analysis is
- How to read a Diagnostic Plot
- Why the analysis of these techniques is different in unconventional reservoirs
- Fundamental principles of reserves and resource management

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Analysis Fundamentals
[RES-URA-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

This eLearning course is designed for professional engineers and geoscientists with a basic understanding of unconventional rocks and fluids and the drilling and completion of horizontal laterals who wish to quickly learn single well analysis techniques, including the key elements of these reservoirs and the technologies to exploit them. Diagnostic plots to identify flow regimes and rate transient analysis (RTA) to understand individual well performance are discussed. Field level topics include field development and reservoir surveillance. Decline curve analysis (DCA) for individual wells is presented followed by Reserves and Resources estimations in unconventionals, primarily under the Petroleum Resources Management System (PRMS) guidance. Attendees should leave this course with the tools to understand individual well behavior as well as field planning and development in the reservoirs which supply an ever-increasing fraction of the world's oil and gas, unconventional reservoirs.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn how to

- Calculate volumetric estimates in unconventional reservoirs
- Apply material balance analysis with corrections for unconventional reservoirs
- Calculate properties from DFIT's
- Calculate drainage volumes from rate transient analysis
- Match historical data and forecast future production using statistical tools adjusted for unconventional reservoirs

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Properties
[RES-URP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course works through the key parameters and how they are measured in understanding unconventional reservoir rock properties. Organic, rock, and mechanical quality factors are defined, and various measurement techniques are described plus an understanding of the uncertainty ranges associated with those measurements.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn

- Specifics about how organic, rock and mechanical quality is quantified
- Why each factor is important in the understanding of unconventional reservoirs
- The difference between Tight Gas Sands and Shale Reservoirs
- Uncertainties in well and laboratory measurements of rock properties

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Properties Fundamentals [RES-URP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course is designed for professional engineers and geoscientists with little experience in unconventional reservoirs who wish to quickly learn the key elements of these reservoirs and the technologies to exploit them. Focused on shale (tight) oil, tight gas, and coalbed methane, this course begins with an introduction to unconventionals then reviews geoscience elements from the previous eLearning courses and demonstrates their use in unconventional reservoir engineering. Fluid sampling for laboratory tests and fluid property correlations are presented. Drilling and completion of wells in unconventional reservoirs are considered, with a focus on horizontal wells. Stimulation fluid systems and proppants are briefly discussed. A key test for stimulation design, diagnostic fracture injection tests (DFIT's) is presented along with classic test signatures. Attendees should leave this course with a better understanding of the basic physics of unconventional reservoirs and the fluids they hold as well as the basics of placing wells in those reservoirs to drain those fluids.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn how to

- Manage the difference between unconventional and conventional fluids
- Develop relationships between rock properties and well performance
- Calculate flow rates under conditions in which fluid models break down
- Use simulated rock volumes and discrete fracture networks

Suggested prerequisite

• Unconventional Reservoir Properties [RES-URP-1]

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Waterflood Analytical Forecasting Fundamentals [RES-WAF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course is a deep dive into a selection of the most popular analytical waterflood models. We provide step-by-step instructions on how to build each one and discuss the mathematics necessary to make them work in the 21st century.

Designed for

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

You will learn how to

- Predict waterflood performance using the Buckley-Leverett Method
- Predict waterflood performance using the Craig-Geffen-Morse Method
- Predict waterflood performance using the Stiles Method

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Forecasting Overview [RES-WFO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is a survey of the most popular methods used to forecast waterfloods. Here we discuss strengths and weaknesses and expose assumptions on which each technique is built.

Designed for

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

You will learn how to

- Describe multiple statistical methods of predicting waterflood performance
- Describe multiple analytical methods of predicting waterflood performance
- Describe multiple numerical methods of predicting waterflood performance
- Compare the strengths and weaknesses of these prediction methods

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Overview
[RES-WOV-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

In this eLearning course, we start at the very beginning, describing what waterflooding is, how it works, and the differences between various kinds of waterfloods.

Designed for

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

You will learn how to

- Define waterflooding
- Describe how it works
- Explain why waterflooding is applied to some reservoirs
- Explain the differences between patterns
- Describe other ways of typing waterfloods
- Describe how to measure the success of a waterflood

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Planning
[RES-WPC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course discusses waterflood design, compares traditional and agile approaches to design, and covers data requirements and exit strategies.

Designed for

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

You will learn how to

- List the kind of data needed to plan a waterflood
- Explain how to measure the importance of missing data
- Describe how to pay for the collection of important data
- List the choices that need to be considered in creating a robust waterflood design
- Explain why an exit strategy is important
- Describe how to create a waterflood design that will be relevant more than two days after startup

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Reservoir Heterogeneity Effects Fundamentals
[RES-WRH-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4.5 hrs

In this eLearning course, we use models to demonstrate how heterogeneity and anisotropy complicate our understanding of how water displaces oil in the reservoir.

Designed for

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

You will learn how to

- Explain why shale continuity is critical to predicting waterflood performance
- Describe how dipping reservoirs behave differently under waterflooding
- Describe how reservoir anisotropy controls waterflood performance
- Explain why reservoir continuity is critical to predicting waterflood performance
- Describe how natural and hydraulic fractures affect waterflood performance
- Explain how reservoir heterogeneity can be measured and compared

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Optimization
[RES-WOP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

In this eLearning course, we survey the kinds of opportunities available to optimize a waterflood and discuss ways to efficiently implement changes.

Designed for

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

You will learn how to

- Explain how to search for optimization opportunities by:
  - Measuring deviations from expectations
  - Revisiting design assumptions
  - Deploying new technology intelligently
  - Moving from secondary to tertiary

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Reservoir Property Effects Fundamentals
[RES-WRP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

In this eLearning course, we demonstrate how rock and fluid properties affect the performance of a waterflood using analytical and numerical models. We then explain our observations by describing the physics of water displacing oil in the reservoir.

Designed for

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

You will learn

- What a DFIT, RTA, DCA analysis is
- How to read a diagnostic plot
- Why the analysis of these techniques is different in unconventional reservoirs
- Fundamental principles of reserves and resource management

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Surveillance
[RES-WSC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, we assemble and describe a diversified collection of surveillance techniques that have been proven effective for managing waterfloods all over the world.

Designed for

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

You will learn how to

- Describe multiple ways to monitor the performance of an injection well
- Describe multiple ways to monitor the performance of a producing well
- Describe multiple ways to monitor the performance of a pattern
- Describe multiple ways to measure the connectivity between injectors and producers

This eLearning course is included in the Waterflooding A to Z eLearning series.

Waterflood Water Sources
[RES-WWS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

In this eLearning course, we compare water sources, describe how injection water interacts physically and chemically with our reservoir, wells, and surface facilities, and discuss how we can change the properties of our injection water on the surface.

Designed for

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

You will learn how to

- Identify sources of water for a waterflood
- Identify which properties of the water matter
- Identify which properties of the water source matter
- Describe how impurities can be removed from injection water
- Describe what kinds of materials are added to injection water

This eLearning course is included in the Waterflooding A to Z eLearning series.

Bits and Hydraulics
[IAM-BHC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course addresses roller cone and fixed cutter bit design features and their associated hydraulics programs at an awareness competency level.

Designed for

Technical staff, business professionals, technicians, analysts, and other non-technical staff who are involved with but have limited experience with drilling operations.

You will learn how to

- Identify design features and selection criteria for roller cone bit types
- Explain failure modes for roller cone bits and how this information can be used to improve performance
- Identify design features and selection criteria for fixed cutter bit types
- Explain failure modes for fixed cutter bits and how this information can be used to improve performance
- Explain tool system options which allow wellbore enlargement to a diameter greater than the internal drift diameter of a previously installed casing string
- Discuss situations where this may be required
- Explain rotary coring bit options
- Explain the relationship between cost per foot of a bit run and the cost of a bit, its rate of penetration, footage drilled, and the cost of the drilling operation
- Determine optimum time to pull a used bit based upon its cost per foot trend
- Balance competing objectives for the drilling hydraulics system
- Maintain ECD below fracture pressure of open hole
- Select nozzle sizes for adequate bit hydraulics
- Maintain operating pressure and total pump power demands within rig capabilities

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology

Casing Running Operations
[WCD-CRO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

Casing is pipe that goes into the wellbore. Casing stays in the well because the outside of the casing is cemented into the earth, providing wellbore integrity. In other words, the casing's primary purpose is to keep the wellbore from caving in or fracturing, to keep unwanted fluids from entering the wellbore, and to keep the desired fluids (hydrocarbons) from leaving the borehole at undesirable places. In This eLearning course, you will study four topics:

- Handling Casing: This topic introduces the process of getting the casing to the rig floor. It explains the concept of stacking casing in reverse order, numbering casing, and the types of casing you will see at an oil rig.
- Rigging up Casing Running Equipment: This topic overviews the running casing checklist, Job Safety Analysis (JSA) and equipment used for setting casing in a borehole. It explains the purpose and function of spiders, elevators, power tongs, and the stabbing board.
- Making up the Shoe Track: This topic introduces the shoe track and some of the other pieces of a casing string. It explains the purpose of the float shoe, guide shoe, float collar, thread locking compound, and centralizers.
- Running Casing: This topic provides an in-depth explanation of running the casing into the borehole. It describes the "dance"—the set of steps and movements of the casing crew that help to get the casing in the borehole quickly, efficiently, and safely.

Designed for

- Individuals interested in understanding what it takes to run casing
- Members of an extended multidiscipline team

You will learn how to

- Describe the steps of running casing, from getting the casing to the rig to running the casing into the borehole
- Determine safe working practices while running casing on a rig
- Identify responsibilities of and organize all wellsite personnel for normal casing running operations
- Identify the purpose of the basic running casing equipment and key steps used to run casing

This eLearning course is included in the Basic Drilling Technology eLearning series.

Characterizing the Drilling Environment
[WCD-CDE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course is the basis for drilling engineering and well planning. It provides an overview of geologic formations and key characteristics which the well planner must incorporate into their design considerations. Included is an overview of petroleum geology along with descriptions of both conventional and unconventional petroleum systems, structures and traps, formation fluids, and rock properties. The relationship between pore pressure and fracture gradient is explained and their application to well design considerations. Provided is a brief description of fluid selections and properties, casing and cementing operations, wellbore stability, and well control. Leak-off tests and/or formation integrity tests are discussed and how they are conducted. An overview of formation evaluation techniques is also addressed, including mudlogging, wireline LWD logging, coring, and testing with the data collected during each activity. An overview of types of drilling rigs and their most suitable application coupled with operational risks is provided.

Designed for

Operator and service company technical staff including drilling engineers and operations supervisory personnel. A practical basis for non-technical staff involved in supporting drilling operations.

You will learn

- The basis of well planning and how geology and geologic characteristics affect the well plan
- How pore pressure and fracture pressure are critical in well planning and active drilling operations
- How to utilize rock types and properties, formation fluid types and properties, and other geoscience information appropriately in well design and operational decisions including: fluid selection, casing points, cementing operations, well control procedures, and risk assessment
- The significance of the leak-off test and formation integrity test data and how to support operational decisions
- What formation evaluation methods are available and how to actively utilize them to support well planning and real time decision-making
- What type of drilling rig is best suited for a particular environment and critical concerns when operating in that particular environment

This eLearning course is included in the Basic Drilling Technology eLearning series.

Defining Well Objectives
[IAM-DWO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course provides an overview of how various well objectives contribute to the understanding of the asset. Key stakeholders and the activities that impact the well plan are discussed. Also explained in this eLearning course are why well objectives change over the life of the asset and the commonly used key performance metrics for the drilling discipline.

Designed for

Technical staff, business professionals, technicians, analysts, and other non-technical staff who are involved with but have limited experience with drilling operations.

You will learn how to

- Identify stakeholders in an effort to define well objectives
- Explain how various well objectives contribute to understanding of the asset
- Identify activities focused on achieving well objectives and how they may impact the well plan
- Explain why well objectives change over the life of the asset
- Identify commonly employed performance metrics for the drilling discipline

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology

Directional Drilling and Trajectory Design
[IAM-DDC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

Directional drilling may be considered the “intentional, controlled deflection of a wellbore to intersect pre-determined targets.” In the early days when wooden derricks were erected so close that they touched each other, wellbores that were believed to be vertical occasionally intersected nearby wellbores, proving that the wells were in fact deviating from vertical. This was not directional drilling because this behavior was neither intentional nor controlled. Modern directional drilling is based on an understanding of the reservoir and how the wellbore should be constructed for its proper placement in the reservoir for optimum productivity.

Designed for

Technical staff, business professionals, technicians, analysts, and other non-technical staff who are involved with but have limited experience with drilling operations.

You will learn how to

- Describe the objectives of directional drilling
- Recognize trajectory design options and selection criteria for given surface and downhole requirements
- Clarify trajectory measurement and wellbore position calculation techniques and limitations

This eLearning course is included in the Basic Drilling, Completions, and Workover Operations eLearning series

Drill String and BHA
[IAM-DSB-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course explains the various drill string components and their purpose. The eLearning course also explains the performance properties of drill strings, how to diagnose drill string mechanisms, and the steps to prevent drill string failures.

Designed for

Technical staff, business professionals, technicians, analysts, and other non-technical staff who are involved with but have limited experience with drilling operations.

You will learn how to

- Identify drill string components and their suppliers
- Explain the purposes of the various drill string components
- Determine drill string performance properties
- Diagnose drill string mechanisms
- Identify steps to prevent drill string failures

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology

Drilling Fluids and Solids Control
[IAM-DFS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

Drilling fluids are the “lifeblood” of drilling operations and comprise a wide-range of functions including suspension of formation cuttings, maintaining wellbore integrity, downhole pressure control and others. The proper selection of a drilling fluid can allow optimum performance in each of these areas as well as meeting environmental guidelines and performance objectives. The successful removal of solids from the fluid allows cost-effective maintenance of fluid properties and overall reduced well costs. This eLearning course addresses these topics at an awareness level.

Designed for

Technical staff, business professionals, technicians, analysts, and other non-technical staff who are involved with but have limited experience with drilling operations.

You will learn how to

- Identify functions of drilling fluids
- Explain fluid types and their selection criteria
- Identify fluid properties, how they are measured, and additives used to control them
- Explain benefits of solids control, solids control equipment function, and system configuration

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology

Drilling Operations and Well Completions
[IAM-DOW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, you will learn about well function, onshore and offshore drilling, drilling programs, drilling rig components, and drilling systems (including drilling, rotating, fluid, and blowout prevention systems). You will also learn about casing and cementing, wellhead installation, types of well completions, formation damage, well perforation, sand control strategies, and well stimulation.

Designed for

Those who need to achieve a context and understanding of E&P technologies, or the role of technical departments in oil and gas operations, and/or be able to understand and use the language of the oilfield.

You will learn

- The advantages and disadvantages of early and modern types of drilling styles
- Rig type classification and selection for onshore and offshore drilling
- Types of platforms and techniques used for offshore rigs
- The purpose and function of non-vertical drilling, including directional and horizontal drilling
- The components of a drilling system
- The components of a drilling rig
- The drilling systems of a rig
- The purpose and function of the rotating system
- Drilling fluid properties and function
- Purpose and function of blowout preventers
- Purpose of casing and cementing
- Purpose and function of the wellhead
- Overview of different types of well completions
- Formation damage
- Methods of well perforation
- Sand production problems and control strategies in reservoirs
- Common well stimulation strategies

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Production Technology for Other Disciplines

Oilfield Casing
[WCD-OCC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

Casing is pipe that goes into the wellbore and stays in the well because the outside of the casing is cemented to the earth which provides wellbore integrity. In other words, casing’s primary purpose is to keep the wellbore from caving in or fracturing, to keep unwanted fluids from entering the wellbore, and to keep the desired fluids (hydrocarbons) from leaving the borehole at undesirable places. In this eLearning course, you will study five topics:

- The Drilling Process: This topic introduces the process of drilling an oil well, showing how casing, mud, and cement are used
- API/ISO Standards: This topic overviews the naming conventions for casing. It explains how to identify casing by its properties
- The Casing Manufacturing Processes: This topic introduces the two major methods of making casing, Seamless and Electric Resistance Weld (ERW). It explains the processes by which both types of casing are made, from generating the steel to the formation of the finished casing products
- Casing Properties and Dimensions: This topic provides an in-depth explanation of each casing property. It describes, in detail, each dimension listed in the API/ISO naming convention
- Casing Strings: This topic overviews the four casing strings—conductor, surface, intermediate, and production—and how these casing strings work together in an oil field well

Designed for

Individuals interested in the basic use of casing in oil fields and members of an extended multidiscipline team

You will learn how to

- Describe the purpose of casing in an oilfield well
- State how joints of casing are connected together
- Recognize the steps in the process for drilling and cementing casing in an oil/gas well
- Demonstrate knowledge of the API/ISO casing naming convention
- Discuss the advantages and disadvantages to casing produced with seamless and ERW properties
- Identify casing descriptions and dimensions and, when appropriate, describe the correlation between them
- Identify where the four different casing applications are in a wellbore schematic

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology

Primary and Remedial Cementing [PCE-PRC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course presents an overview of the planning and execution required to achieve the quality primary cementing of well casing strings to successfully isolate a wellbore's geological column, including the well's productive zone(s). Equipment and cement displacement practices are illustrated as well as methods to assess the resultant cement sheath surrounding casing following a cementing job. Preliminary lab work to formulate primary cement blends is described. Various methods are presented in the remedial repair of poorly cemented zones which can lead to life of well production problems. Several different cement squeeze techniques are explained, and recommended practices are described.

Designed for

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

You will learn

- The manufacturing processes to blend composite materials that make up oilfield cement
- The various uses of additives to modify cement properties
- The cementing tools at the surface and downhole and the related cement displacement process to achieve a quality primary cement job to isolate a casing string
- The casing cement evaluation tools and methods to assess cement job quality
- The various practices that comprise options to attempt repair of primary cementing jobs that are referred to as cement squeeze operations
- How to calculate casing string cement volume requirements
- How to evaluate a cement bond log and make recommendations
- How to conduct plug and abandonment operations, what they are, basic equipment used and expected results to securely isolate the wellbore from the environment and human interaction for the future

Suggested prerequisite

Onshore Unconventional Well Completions [PCE-OUW-1]

This eLearning course is included in these eLearning series:

- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology
- Production Operations I

Stuck Pipe Prevention [WCD-SPP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course specifically addresses the basis for understanding and preventing stuck pipe situations during drilling operations. It provides a general overview of geological formations and how these formations can become unstable during a drilling operation. Likewise, drilling fluids are discussed and how they can impact the stability of the wellbore. This eLearning course also covers the mechanisms for pipe sticking, how to diagnose stuck pipe situations, and how to implement recovery efforts. Information is also given on how long to devote to fishing efforts. Lastly, this eLearning course covers drill string operating limits and gives calculations on how much pull can be on the drill string.

Designed for

Operator, drilling contractor, and service company technical and non-technical staff, including drilling engineers, drilling technicians, drilling supervisors, tool pushers, and drillers.

You will learn

- The contributing factors to wellbore stability and how pore pressure and fracture pressure change during the drilling operation
- The primary requirements of the drilling fluid and what the desired performance fluid properties should be
- All the factors and forces that affect hole cleaning efforts within vertical and horizontal wells
- How to diagnose stuck pipe situations by determining the specific sticking mechanism and how to implement recovery efforts
- About the different industry fishing tools available and how they function
- How to make good decisions about how much time a drilling operation should devote to a fishing operation
- The limits of a drill string and how much can be pulled

This eLearning course is included in the Basic Drilling Technology eLearning series.

Well Construction Supply Chain Management [WCD-WCS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This is an introductory eLearning course that reviews the basic concepts of personnel relationships at the well site, supplier management, technical and HSE inspections at the well site, third party contracting, and logistics pertaining to the well construction operation.

Designed for

This eLearning course is Designed for anyone who desires a basic overview of these topics as they pertain to the supply chain processes at the well site.

You will learn how to

- Explain the basic objectives and working relationships between operators, drilling contractors, and service companies at the well site
- Describe the purposes of rig and service company inspection programs as they pertain to equipment, personnel, and HSE adherence at the well site
- Describe the basic process of rig contracting and acquisition
- Describe "third party" rig service contracting
- Identify goals to supply drilling rig operations with the necessary tools, equipment, and services as required

This eLearning course is included in the Basic Drilling Technology eLearning series.

Well Performance Management [WCD-WPM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

Performance improvement illustrates several process, organization, and leadership approaches and tools utilized to make drilling more effective and efficient. Activities are identified in both the planning phase and the operational phase. Opportunities are targeted that focus on making individual tasks safer, more efficient, and more consistent and, where appropriate, on moving tasks off the critical path of the rig to shorten well delivery time. Critical leadership and team skills are reviewed to reinforce desired behaviors and establish working culture. Finally, non-productive time mechanisms, including stuck pipe prevention, are addressed in detail with case studies.

Designed for

Operator and service company technical staff including drilling engineers and operations supervisory personnel.

You will learn

- Explain the concepts and benefits of a performance improvement process for drilling
- Explain what an AFE is, and its components
- Explain the purpose of After-action reviews and why they are relevant to future operations
- Recognize the importance of governmental approvals and permits as required by the drilling business
- Recognize the importance of safety management plans in the drilling environment
- Explain what comprises an “oil spill” and the importance of having a spill remediation plan
- Recognize the critical role of waste management at the well site
- Recognize why safety is everyone’s responsibility at the wellsite
- Describe what constitutes Job Safety Analysis

This eLearning course is included in the Basic Drilling Technology eLearning series.

Well Site Management Part 1 – Logistics, Communication, and Safety [WCD-WSM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

Rigsite Logistics Management focuses on the management and administrative functions of the well site supervisor. These include supervision and quality control of the data collection process during daily operations, ensuring drilling contractor, drilling fluids, directional drilling, and other service company-provided information. Discussions also address planning and prioritizing work, along with various work controls such as JSAs, Permit to Work, 24-hrs and 72-hrs lookaheads, pre-job safety meetings, toolbox talks, effective handovers, SIMOPS, and stop work authority. Other activities outlined include managing supplier relationships by communicating work requirements and schedules, approving invoices.

Designed for

Operator and service company technical staff including drilling engineers and operations supervisory personnel.

You will learn how to

- Manage wellsite logistics
  - Supplier management
  - Data collection and reporting
  - People movements
- Manage wellsite operations
  - Prioritize and schedule work
  - Supervise task preparation and execution
  - Control workflow with JSAs, Permit to Work, SIMOPS
- Implement scheduling, lookaheads, handovers

This eLearning course is included in the Basic Drilling Technology eLearning series.

Well Site Management Part 2 – Planning, Operations, and Continuous Improvement [WCD-WS2-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

Rigsite Logistics Management focuses on the management and administrative functions of the well site supervisor. These include supervision and quality control of the data collection process during daily operations, ensuring drilling contractor, drilling fluids, directional drilling, and other service company-provided information. Discussions also address planning and prioritizing work, along with various work controls such as JSAs, Permit to Work, 24-hrs and 72-hrs lookaheads, pre-job safety meetings, toolbox talks, effective handovers, SIMOPS, and stop work authority. Other activities outlined include managing supplier relationships by communicating work requirements and schedules, approving invoices.

Designed for

Operator and service company technical staff including drilling engineers and operations supervisory personnel.

You will learn how to

- Manage wellsite logistics
  - Supplier management
  - Data collection and reporting
  - People movements
- Manage wellsite operations
  - Prioritize and schedule work
  - Supervise task preparation and execution
  - Control workflow with JSAs, Permit to Work, SIMOPS
- Implement scheduling, lookaheads, handovers

This eLearning course is included in the Basic Drilling Technology eLearning series.

Well Construction Supply Chain Management [WCD-WCS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This is an introductory eLearning course that reviews the basic concepts of personnel relationships at the well site, supplier management, technical and HSE inspections at the well site, third party contracting, and logistics pertaining to the well construction operation.

Designed for

This eLearning course is Designed for anyone who desires a basic overview of these topics as they pertain to the supply chain processes at the well site.

You will learn how to

- Explain the basic objectives and working relationships between operators, drilling contractors, and service companies at the well site
- Describe the purposes of rig and service company inspection programs as they pertain to equipment, personnel, and HSE adherence at the well site
- Describe the basic process of rig contracting and acquisition
- Describe “third party” rig service contracting
- Identify goals to supply drilling rig operations with the necessary tools, equipment, and services as required

This eLearning course is included in the Basic Drilling Technology eLearning series.

Advanced Nuclear Production Logging Fundamentals [PCE-ANP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10 hrs

The goal of production logging is to obtain an accurate interpretation of downhole tool measurements of temperature, pressure, fluid holdups, and fluid velocities to determine flow rates of each phase. These measurements provide the only way to know for sure what is happening downhole. This eLearning course focuses on interpretation of multiple-phase flow in vertical to high angle and horizontal wells using advanced nuclear production logging techniques. Pulsed neutron capture, pulsed neutron spectroscopy, and oxygen activation measurement principles are reviewed with emphasis on those measurements that have production logging applications. Unlike conventional and array production logging measurements that can only sense what is happening inside the casing, nuclear measurements can also sense some of what is happening behind the casing.

Designed for

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

You will learn

- How pulsed neutron capture, pulsed neutron spectroscopy, and oxygen activation tools work
- How to identify formation and borehole fluid contacts and distinguish between the two
- Which measurements are used to identify formation properties versus completion effects
- How to use a pulsed neutron capture tool to log down and identify hydrocarbon/water contacts in the casing and annulus with the well shut-in
- How to interpret data and estimate flow rates from oxygen activation measurements
- How to use a pulsed neutron capture tool with gadolinium tracers to estimate oil and water flow rates
- How to determine gas and oil holdup from pulsed neutron spectroscopy measurements

* It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

Completion Design Fundamentals [PCE-DEF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10.5 hrs

This eLearning course will take you through multiple facets of completion design Fundamentals. The topics that are covered in This eLearning course include an extensive look at conduits, circulating and killing wells, inflow and outflow, along with well barriers and well servicing fluids, and a few more.

Designed for

Engineers within the first two years of a completions and/or workover role, Production operations staff, Service company engineers and managers, Drilling engineers, Reservoir Engineers, Field supervisors and managers, other asset team members who routinely work with completion or workover staff.

You will learn how to

- Identify the most common sandface completion options
- Explain the advantages and disadvantages of each option
- Describe the different conduit options
- Explain the benefits or disadvantages of each option
- Differentiate between “killing” and “offloading” the well
- Explain the various options for displacement or circulating in a completion
- Describe the difference between bullheading and circulating
- Describe where to locate the primary circulating device
- Differentiate between the various circulating path options
- Explain the relationship between inflow and outflow
- Explain how this relationship impacts completion design
- Describe the most common method of determining inflow – Darcy’s law
- Define a barrier
- Explain why barriers are critical to well operations
- State the normal industry practice for the number of barriers required during an operation
- Determine a hydrostatic barrier density requirement
- Describe the functions of well intervention fluids
- List the main types of completion fluids
- Describe common additives
- Differentiate between completion fluids, packer fluids, kill fluids, perforating fluids, and others
- Explain several of the most important interface points between drilling and completions
- Critique a well sketch
- Describe selection criteria for elastomers

This eLearning course is included in the Completions and Workovers eLearning series.

Conventional Production Logging: Temperature and Single-Element Spinners Fundamentals [PCE-TSE-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

The goal of production logging is to obtain an accurate interpretation of downhole tool measurements of temperature, pressure, fluid holdups, and fluid velocities to determine flow rates of each phase. Achieving this goal requires understanding the measurements made by various production logging tools and how these tools make those measurements. This eLearning course focuses on interpretation of single-phase flow. It covers temperature logs and single-element spinner-type flow meters and how to use them to determine flow rates for single-phase flow.

Designed for

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

You will learn

- How to identify fluid entries on a temperature log run in a flowing well and how to distinguish gas entries from liquid entries due to the Joule-Thompson cooling response
- How formation thermal conductivity affects the shape of the geothermal gradient
- How formation thermal diffusivity affects the rate of wellbore warm back when shutting in a flowing or injecting well
- How to calculate relative flow rates from a flowing temperature log
- How fluid heat capacity affects the shape of a flowing or an injecting temperature log
- How to identify injection intervals on an injecting temperature log and how to calculate their relative injection rates using the Ramey equation
- The different types of spinner flow meter tools and how they make their measurements
- How to identify fluid entry/fluid injection rates on flowing/injecting spinner surveys and how to calculate flow rates from a multiple-pass spinner logging survey

- It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

Conventional Production Logging: Two-Phase Flow Fundamentals [PCE-TPF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

The goal of production logging is to obtain an accurate interpretation of downhole tool measurements of temperature, pressure, fluid holdups, and fluid velocities to determine flow rates of each phase. These measurements provide the only way to know for sure what is happening downhole. Achieving this goal requires understanding the measurements made by various production logging tools and how these tools make those measurements. This eLearning course focuses on interpretation of two-phase flow. It covers pressure, differential pressure, capacitance, focused gamma fluid density, non-focused gamma, and backscattered gamma holdup measurements, the definition and description of two-phase flow regimes, and how to use them to determine flow rates for two-phase flow.

Designed for

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

You will learn

- How to identify fluid entries on pressure, differential pressure, capacitance, focused gamma density, non-focused density, and backscattered gamma logs acquired in a flowing well and how to calculate fluid holdups from these measurements
- Which measurements can be used in deviated and high angle-horizontal wells and how to interpret those measurements that can be used in these conditions
- The basic flow regimes for two-phase flow and how to estimate when each might be occurring down hole
- How two-phase flow affects a spinner log, how to correct for it when this can be done, and when one needs measurements in addition to the conventional spinner measurements
- How to calculate two-phase flow rates from a multiple-pass spinner logging survey using one or more types of fluid holdup measurements when fluids are well mixed

* It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

Design Process for Completion and Workovers [PCE-DEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course focuses upon three main work products of a typical completion or workover design – the proposed well sketch, the proposed procedure, and then the underlying basis of design. In addition, field/rig morning reports are introduced and reviewed in view of the original design plans.

Designed for

Engineers within the first two years of a completions and/or workover role, Production operations staff, Service company engineers and managers, Drilling engineers, Reservoir Engineers, Field supervisors and managers, other asset team members who routinely work with completion or workover staff.

You will learn how to

- Explain the work product of a completions engineer
- Describe an initial completion procedure and sketch
- Translate chronological steps from a procedure to a well sketch
- Recognize and describe morning reports
- Recognize the engineering that is required for developing a procedure
- Explain and provide an example of Basis of Design (BOD)
- Compare and contrast design and BOD
- Illustrate and explain the link between management systems and the engineering design process
- Identify the objectives of a completion
- Identify and describe each aspect that is to be considered to achieve the two objectives
- Compare the different drive mechanisms

This eLearning course is included in the Completions and Workovers eLearning series.

Electric Submersible Pumps (ESP) [PCE-ESP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

An electric submersible pump is a specialized device used in the oil and gas industry. It's essentially an electrically powered pump designed to operate deep within an oil well. This pump is submerged in the wellbore and is responsible for lifting crude oil and other fluids from the reservoir to the surface. By using electricity to power the pump, it efficiently moves the petroleum to the surface for further processing and distribution. Electric submersible pumps are a crucial technology in the oil industry, ensuring the efficient but costly extraction of oil from deep underground reservoirs.

Designed for

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

You will learn

- Identify the three critical electric submersible pump design challenges: solids (sand), gas, and dependable power to maximize ESP run life (as the average industry ESP run life is approximately 2.4 years)
- Understand the principles of downthrust, upthrust, pump efficiency, total dynamic head (TDH), number of stages required, and pump horsepower required to successfully operate ESPs
- Recognize the characteristics of ESP electrical cable, variable speed drive, and controller components in a functioning ESP

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Electric Submersible Pumps (ESP) Fundamentals [PCE-ESP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6 hrs

This eLearning course explains how to conduct inflow performance analysis and select the appropriate electric submersible pump (ESP) configuration to achieve production rate targets in wells in conventional and unconventional resources plays and document equipment failure data when required.

Designed for

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

You will learn how to

- Calculate the production rate and the pump intake pressure from inflow performance analysis
- Calculate the free gas and fluid viscosity at pump intake conditions
- Determine the pump capacity and motor horsepower required to deliver the desired flow or rate limited by the ESP equipment
- Determine the power cable type and gauge based on formation parameters
- Ensure ESP equipment failure data is properly documented
- Review failure trends
- For an ESP design, select the appropriate protector for a given application
- Calculate the production rate and pump intake pressure using widely accepted techniques applicable to unconventional resource wells
- Determine the pump capacity and motor horsepower required to deliver the desired production rate in unconventional resource wells

Suggested prerequisite

• Electric Submersible Pumps (ESP) [PCE-ESP-1]

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Flow Assurance and Production Chemistry [PCE-FAP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

The term “Flow Assurance” and the tools of “Production Chemistry” comprise this eLearning course’s content to examine the identification, remediation, and preventive aspects of common wax, asphaltene, scale, and corrosion problems common to most all hydrocarbon production scenarios in one manner or another. Each of these problems requires the application of varied principles and practices of production chemistry in various ways to directly address the control and removal of these complications which negatively impact production. Pictures, illustrations, and examples of typical field problems and challenges faced are developed with the singular goal of presenting proven, least cost, safe remedies to return production to its initial, expected rate.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers; field supervisors; field technicians, service company engineers, and especially engineers starting a work assignment in production engineering and operations or other engineers wanting a foundation in the principles of managing the identification, treatment, prevention, and overall control of oilfield waxes, asphaltenes, inorganic scales, and corrosion.

You will learn

- Typical oilfield “flow assurance” issues and problems due to waxes, asphaltenes, inorganic scales, and corrosion
- How to interpret revealing signs of corrosion and erosion failure, scale formation, and related downhole deposits and how to prevent or minimize their production loss effects
- How formations become damaged due to related flow assurance and production chemistry issues
- The importance of collecting data to categorize options to choose an optimum well prevention and treatment plans
- How to recognize, prevent, remove, and manage organic paraffin and asphaltene field deposits
- How to recognize, prevent, remove, and manage typical common soluble and insoluble scales in oil and gas operations
- The conditions required for the formation of gas hydrates
- How ice crystals and methane in pipelines can lead to severe plugging of lines if not prevented from occurring or regularly removed by pigging operations

This eLearning course is included in these eLearning series:

- Completions and Workovers
- Production Operations I

Formation Damage and Matrix Stimulation [PCE-FDC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course addresses less than expected production results following initial completion or any well intervention operation and the many possible causes involved. Characteristics of formation damage are explained. Matrix acidizing (acidizing operations conducted at treatment pressures less than fracture pressure) is developed for both limestone and sandstone formations to improve production. Important principles of candidate selection and job planning, and execution are addressed.

Designed for

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

You will learn

- The basic causes of oilfield formation damage and how they are recognized
- The concept of “True Formation Damage” and the principles of formation remediation once it has been correctly identified as being the cause of lost production
- How “pseudo” damage and differs from True Formation Damage
- The principles of limestone matrix acidizing and the chemistry and reactions involved
- The principles of sandstone matrix acidizing and the chemistry and reactions involved
- Formation damage identification and the positive results achieved by successfully conducting matrix acidizing jobs

Suggested prerequisite

- Perforating [PCE-PEC-1]

This eLearning course is included in these eLearning series:

- Basic Drilling, Completions, and Workover Operations
- Completions and Workovers
- Production Operations I
- Production Technology for Other Disciplines

Formation Damage and Matrix Acidizing Fundamentals [PCE-FDF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	10 hrs

This eLearning course addresses the complex oilfield phenomena that studies and attempts to resolve production loss or less than expected production rate following initial completion or any well workover or intervention activity. Formation damage is a term often used to describe the cause of production loss; its use is commonly misunderstood or misused as many factors and circumstances may be the cause of reduced rate. The set of circumstances referred to as "True" Formation Damage is described in detail; production loss caused by these circumstances may often be remediated as long as causes are properly defined, and appropriate remedial steps are taken. Other causes of production shortfall, also grouped into the formation damage term to describe lost production, are identified in the eLearning course along with recommended remedial steps to address them.

Designed for

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

You will learn how to

- Illustrate the impact of formation damage upon production
- Explain the wide variety of reasons, sources, depositional environments, and routine operations' activities that result in production limitations
- Assess formation damage "skin" values
- Calculate production rates with various levels of formation damage as well as no formation damage
- Describe how TFD is recognized and how PD is recognized and present the characteristics and elements of each
- Illustrate clay stabilization through the use of positively charged cation exchange to stabilize negatively charged clays to limit clay migration, hydration, and other damaging mechanisms

Suggested prerequisite

Formation Damage and Matrix Stimulation [PCE-FDC-1]

This eLearning course is included in the Production Operations I eLearning series.

Gas Lift [PCE-GLC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

Gas lift is a common technique used in the oil and gas industry to enhance the production of oil or natural gas from a well. It involves injecting gas into the well to reduce the hydrostatic pressure of the fluid column in the wellbore, which helps lift the oil or gas to the surface. Gas lift is a simple but effective method for increasing the production rate of oil wells, especially in situations where there is already a high gas/liquid ratio. It can be adjusted by controlling the rate of gas injection and the depth at which gas is injected to optimize oil production from the well.

Designed for

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

You will learn

- Understand the concept of gas lift in both unloading mode and operating mode to start up a gas lift completion and operate the completion over its life
- Identify the principles of gas lift valve performance and the proper location of the operating valve and unloading valves
- Recognize the characteristics of lift gas performance analysis to properly establish the most efficient gas lift completion performance conditions

Suggested prerequisite

- Perforating [PCE-PEC-1]

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Gas Lift Fundamentals [PCE-GLF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course describes when best to use gas lift, run inflow performance analysis sensitivity cases, and select optimum tubing size to achieve production rate targets in wells in conventional and unconventional resources plays. It describes the gas lift theory, equipment and covers the best practices of gas lift design, surveillance, and optimization.

Designed for

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

You will learn how to

- Explain situations when gas lift is appropriate
- Calculate the production rate and the flowing bottom-hole pressure from inflow performance analysis in a well completed with a gas lift system
- Calculate the gas lift rate and pressure required to produce the well at a stable flow for various tubing sizes
- Select the appropriate tubing size for a well to be completed with a gas lift system
- Calculate the production rate and flowing bottom-hole pressure using widely accepted techniques applicable to unconventional resources wells completed with a gas lift system
- Design a gas lift installation with the required number of unloading mandrels, charge pressure, and orifice size lift valves at the appropriate spacing based on available gas lift pressure and required lift rate for conventional and unconventional resources
- Operate, troubleshoot and optimize gas lifted wells and network systems

Suggested prerequisite

- Gas Lift [PCE-GLC-1]

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Hydraulic Fracturing
[PCE-HFC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

The reality is that the industry began fracking conventional gas wells in 1947 in the Hugoton Field in southwest Kansas. What is relatively new is the technology and tools which allow us to place multiple hydraulic fracture stimulations along a single lateral in a horizontally drilled unconventional well.

This eLearning course covers basic rock mechanics, stimulation design considerations, and optimum fracture length at the level. It covers both fracture acidizing and propped hydraulic stimulations. It reviews propped hydraulic fracturing for both the conventional sandstone reservoirs and unconventional shale reservoirs and explains why the techniques are different.

Designed for

Production Operations Staff, Reservoir Engineers, Facilities Staff Drilling and Completion Engineers, Geoscientists, Field Supervisors and Managers, Field Technicians, Service Company Engineers and Managers.

You will learn how to

- Describe the significance of rock mechanics in all relevant production engineering operations
- Describe the most common non-chemical stimulation methods, their objectives and limitations in conventional resources plays
- Describe the most common non-chemical stimulation methods, their objectives and limitations in unconventional resources plays
- Describe the basic principles of hydraulic fracturing in conventional plays, the difference between acid and proppant treatments, and how to select optimum stimulation candidates
- Describe the basic principles of hydraulic fracturing in unconventional resource plays, the difference between slickwater and cross-linked treatments, and how to select optimum stimulation candidates

Suggested prerequisite

- Formation Damage and Matrix Stimulation [PCE-FDC-1]

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Completion and Workovers
- Production Operations

Onshore Conventional Well Completions
[PCE-OCW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course describes the major tools, techniques, and processes for completing wells in conventional situations.

Designed for

Production Operations Staff, Reservoir Engineers, Facilities Staff Drilling and Completion Engineers, Geoscientists, Field Supervisors and Managers, Field Technicians, Service Company Engineers and Managers

You will learn

For conventional plays in onshore situations:

- The purpose and basic operational aspects of wellhead, flow control equipment, and the major components used in a basic well completion in conventional plays
- The impact that drilling practices may have on reservoir productivity
- Specify the production target of a well and describe the type of completion or workover design components required to achieve the target
- Describe the basic properties and function of tubing
- Describe which fluid systems are the most important for implementing successful completions and workovers in wells in conventional plays
- Describe the most common equipment components used in conventional wells and what they are used for
- Describe the most relevant steps for implementing completion procedures in wells in conventional resources plays and the proper interaction with all parties involved required
- Describe the most relevant aspects of HSE in completion operations
- Describe how a well flows, the impact of well control on fluid flow, and the most common control and monitoring devices
- Describe the basic requirements to abandon conventional wells Specify the production target of a horizontal well, and describe how this differs from a typical vertical well

Suggested prerequisite

- Well Performance and Nodal Analysis Fundamentals [PCE-WPN-2]

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Completions and Workovers
- Production Operations I

Onshore Unconventional Well Completions
[PCE-OUW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

The term “Unconventional Resources” cuts a wide swath and encompasses many different and unrelated hydrocarbon resources. They have constituted a small but relevant segment of the oil and gas industry for many decades. However, since only about 1998, with the development of shale drilling and completion methodologies, have unconventionals become front page news. Although most relevant in North America, shale plays are being probed and tested in many regions of the world.

This eLearning course addresses both the completion process and the physical completion design of unconventional shale wells at the level. The strongest focus of the course is horizontal shale wells but also includes sections on Coalbed Methane and Heavy Oil.

Designed for

Production Operations Staff, Reservoir Engineers, Facilities Staff Drilling and Completion Engineers, Geoscientists, Field Supervisors and Managers, Field Technicians, and Service Company Engineers.

You will learn how to

- Describe the purpose and basic operational aspects of wellhead and flow control equipment in wells in unconventional plays
- Describe the purpose of each of the major components used in a basic well completion in unconventional resources plays, and the impact that drilling practices have on reservoir productivity
- Describe the function and limitations of each surface and subsurface component of a basic onshore completion in unconventional resources plays
- Describe the basic properties of completion components materials and their limitations in unconventional resources plays
- Describe which fluid systems are the most important for implementing successful completions and workovers in wells in unconventional resources plays
- Describe the most relevant steps for implementing completion procedures in wells in unconventional resources plays, and the proper interaction with all parties involved required
- Describe the most common techniques used to drill, complete, stimulate, & produce typical wells in coalbed methane reservoirs

Suggested prerequisite

- Onshore Conventional Well Completions [PCE-OCW-1]

This eLearning course is included in these eLearning series:
- Completions and Workovers
- Production Operations I

Perforating
[PCE-PEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course illustrates the tools and processes for establishing communication between a well and the productive formation(s) accessed by the well. The evolution of shaped charges is presented, and the means for delivering perforating charges into a well using various gun configurations is illustrated. The importance of understanding charge performance to select the appropriate charge for a particular set of well conditions is discussed.

Designed for

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

You will learn

- The various shaped charges, their design, performance, shot phasing and shot density options, and their advantages and limitations
- The three primary perforating gun conveyance systems and the various gun types available and their individual features Concepts like perforation tunnel damage, gun standoff, underbalance, gun correlation on depth, and other engineering input requirements for each perforation job design

Suggested prerequisite

• Onshore Unconventional Well Completions [PCE-OUW-1]

This eLearning course is included in these eLearning series:
- Completions and Workovers
- Production Operations I
- Production Technology for Other Disciplines

Primary and Remedial Cementing
[PCE-PRC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course presents an overview of the planning and execution required to achieve the quality primary cementing of well casing strings to successfully isolate a wellbore's geological column, including the well's productive zone(s). Equipment and cement displacement practices are illustrated and described, and methods to assess the resultant cement sheath surrounding casing following a cementing job. Preliminary lab work to formulate primary cement blends is described. Various methods are presented in the remedial repair of poorly cemented zones, which can lead to life of the well production problems. Several different cement squeeze techniques are explained, and recommended practices are described.

Designed for

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

You will learn

- The manufacturing processes to blend composite materials that make up oilfield cement
- The various uses of additives to modify cement properties
- The cementing tools at the surface and downhole and the related cement displacement process to achieve a quality primary cement job to isolate a casing string
- The casing cement evaluation tools and methods to assess cement job quality
- The various practices that comprise options to attempt repair of primary cementing jobs that are referred to as cement squeeze operations
- How to evaluate a cement bond log and make recommendations
- How to conduct plug and abandonment operations, what they are, basic equipment used and expected results to securely isolate the wellbore from the environment and human interaction for the future

Suggested prerequisite

- Onshore Unconventional Well Completions [PCE-OUW-1]

This eLearning course is included in these eLearning series:
- Basic Drilling, Completions, and Workover Operations
- Basic Drilling Technology
- Production Operations I

Production Logging
[PCE-PLC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

Experience indicates that surface fluid measurements are not adequate to describe the efficiency of the downhole production system. In new completions, production logging services are used both to ensure optimum ultimate recovery and to investigate production problems brought to light by surface performance. In older wells, the logs aid in identifying mechanical issues and thus assist in planning remedial work for declining producers. If properly planned and executed, production logging is an intrusive measurement method which will help to diagnose the health of producer or injector wells.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers, as an introduction to Production Logging within the frame of a production engineering curriculum.

You will learn

- The principles of cased-hole evaluation tools
- The typical applications and justification for running cased-hole evaluation tools
- The conveyance methods for running cased-hole evaluation tools in the field
- The principles of wireline-run cased hole evaluation tools
- The principles and operation of
  - the logging tools associated with flowmeter tools
  - basic temperature logs
  - basic radioactive tracer logs
  - basic spinner flowmeter logs
  - the gradiomanometer log
- The performance of cased hole logs in single phase flow
- The advantages of running multiple tools within a Production Combination Tool
- Discuss the added value of running a downhole video log in addition to production logs

Suggested prerequisite

• Production Problem Diagnosis [PCE-PPD-1]

- It is recommended that the learner have previous knowledge of basic Inflow and outflow concepts, fluid behavior and completion downhole equipment.

This eLearning course is included in the Production Operations I eLearning series.

Production Logging Fundamentals [PCE-PLF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

From the awareness wells through intelligent completions, the goal of production logging is to accurately interpret downhole tool measurements.

This eLearning course focuses on the description of the physical behavior of single and two-phase flow in wells and introduces the conventional interpretation methods and their limitations.

The latest developments of production logging tools for application in multiphase flow and highly deviated/horizontal wells are covered in the last section. These tools provide a more detailed and reliable picture of fluid distributions and flow rates and overcome the limitations of conventional tools, which remain applicable.

Designed for

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

You will learn

- Calibration principles of flowmeter tools
- The principles involved in interpreting production logging tool data
- The performance of cased hole logs in multi-phase flow
- The application of cased hole logs in deviated wells
- The application of recent advances in cased hole logs in deviated and horizontal wells
- Actual field applications of production logs in three-phase flow
- How production logs can assist water shut-off decisions

Suggested prerequisite

• Production Logging [PCE-PLC-1]

* It is recommended that the learner have previous knowledge of basic Inflow and outflow concepts, fluid behavior and completion downhole equipment.

This eLearning course is included in the Production Operations I eLearning series.

Production Logging in High-Angle/Horizontal Wells Fundamentals [PCE-PLH-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8 hrs

The goal of production logging is to obtain an accurate interpretation of downhole tool measurements of temperature, pressure, fluid holdups, and fluid velocities to determine flow rates of each phase. These measurements provide the only way to know for sure what is happening downhole. This eLearning course focuses on interpretation of multiple-phase flow in high-angle to horizontal wells. Basic flow regime principles are reviewed and the effects on flow regime due to increasing well deviation are discussed. Because high-angle flow tends to be stratified in most cases, array logging tools that make multiple measurements across the wellbore profile are introduced. Two basic approaches for calculating multiple-phase flow rates in high-angle wells are presented.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers, and petrophysicists who need to be able to interpret production logs or understand the production log interpretations done by others.

You will learn

- How increasing wellbore deviation increases slip velocity and heavier phase fluid holdup as well deviation increases to 90°
- Why center-weighted production logging measurements are not suitable for calculating fluid holdup and flow rates in high-angle to horizontal wells
- How gas holdup optical probes, water holdup resistance probes, and multiple-phase holdup capacitance probes work
- How array mini-spinners work
- How to calculate two-phase flow rates from a single-pass logging program using multiple holdup and spinner array measurements

- * It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

Production Logging Wellsite and Downhole Environment [PCE-WDH-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

The goal of production logging is to obtain an accurate interpretation of downhole tool measurements of fluid holdups and fluid velocities. Achieving this goal requires an understanding of the equipment used at the well site to make these measurements and the equipment used to deploy the tools downhole. It is important to know where the tools are in the well with relation to the well components described in the well schematic. Because most production logging tools only measure what is inside the innermost casing string, it is also necessary to know when the primary cement job may be seriously degrading permitting flow behind pipe. This eLearning course covers well site equipment, gamma ray, casing collar and depth measurements, and acoustic methods to determine cement quality behind pipe.

Designed for

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

You will learn

- The basic components of surface equipment used to log a flowing well
- The basic methods used to flow a well
- The fundamental types of completions used in typical wells and the problems associated with acquiring and interpreting production log data in these types of completions
- The basic information shown in a wellbore sketch and how to use this when planning production logging jobs
- How gamma ray and casing collar tools work and how to use them to depth align production logs to open hole logs
- How wireline depth measurements are made and how they compare with pipe tallies and coiled tubing depth measurements
- How conventional cement bond and ultrasonic cement bond logging tools work, what they measure, and how to do a qualitative interpretation of cement bond quality

- * It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

Production Principles
[PCE-PPC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course introduces four characteristics of optimum oil and gas depletion production principles, namely:

1. Effects of Geological and Reservoir Properties
2. Inflow and Outflow Performance
3. Tubing Strings, Outflow, and Lift Mechanics
4. Field Development Planning

Each is examined to illustrate the importance of up-front data acquisition to perform studies to understand target design objectives for both conventional oil and gas reservoirs and unconventional shale oil and shale gas reservoirs and unconventional coal bed methane reservoirs.

Designed for

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

You will learn

- Effects of depositional environment and the rock cycle in the formation of hydrocarbon accumulations
- Reservoir engineering principles that guide optimum conventional and unconventional reservoir development
- The important characteristics of oilfield Inflow and Outflow and their related mathematical flow equations and applied principles required for system modeling
- Why a well flows on natural flow and the eventual requirement for artificial lift to maximize overall recovery as reservoir depletion occurs and reservoir energy diminishes
- Special considerations for tubing regarding erosional velocity and critical flow condition
- Key field development parameters that are common to all well designed hydrocarbon exploitation systems

This eLearning course is included in these eLearning series:
- Production Operations I
- Production Technology for Other Disciplines

Production Problem Diagnosis
[PCE-PPD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	10 hrs

The early detection of “Problems” in producing and injection wells is one of a Production Engineer’s primary responsibilities. The earlier that one recognizes a problem exists, the less severe the problem, the sooner the problem can be corrected, and the sooner the production rate will be restored. This eLearning course focuses on four primary aspects of “Problem Wells”: 1) Causes, 2) Effects, 3) Detection, and 4) Prevention.

Designed for

Production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geoscientists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Identify the characteristics of “Problem Wells”
- Recognize that the term “Problem Well” can be applied to both producing and injection wells
- Recognize the many different causes of “Problem Wells”
- Recognize how these different causes manifest themselves in either productivity reductions or operational problems associated with our wells
- Recognize the various diagnostic methods available to determine that a problem(s) exists
- Understand the various Production Logging Tools (PLT) available to determine the causes of our well problems
- Determine the “Problem Wells” based on a table
- Properly diagnose a “Problem Well” based on information given in a table
- Understand the importance of complying with well component requirements to ensure the integrity of a well though the life of the well
- Understand the process of Root Cause Failure Analysis as it applies to ESP failures
- Recognize many of the methods available to us to prevent wells from becoming “Problem Wells”

Suggested prerequisite

- Formation Damage and Matrix Stimulation [PCE-FDC-1]

This eLearning course is included in these eLearning series:
- Production Operations I
- Production Technology for Other Disciplines

Production Technology Applications
[PCE-PTA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course addresses selected applications which may be put into practice in designing and operating a hydrocarbon asset.

Both conventional limestone and sandstone reservoir examples and situations as well as unconventional shale oil and gas reservoirs and various real-world applications are presented for discussion. Among various technologies presented are an overview of subsea development, well completion equipment, smart wells and smart field know-how and hardware and software, expandable tubulars, swellable elastomers, produced water shut off chemistry, surveillance practices, and other contemporary production technology advancements regularly utilized in contemporary developments throughout the oilfield.

Designed for

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

You will learn how to

- Describe examples of proven, established, historical oilfield industry production technology application and practices
- Describe examples of more recently developed proven, established, oilfield industry production technology application and practices
- Justify establishing superior oilfield data gathering practices and related data quality control, data organization, and data access methods
- Recall the history of and present day application and advancement of digitalization in the oilfield
  Explain the diversity of downhole well completion tool applications and the proper selection of completion equipment

This eLearning course is included in the Production Technology for Other Disciplines eLearning series.

Reciprocating Rod Pumps Fundamentals [PCE-RRP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8.5 hrs

The eLearning course focuses upon understanding the three main components of a rod pump well completion, namely, the surface unit, the rod string, and the downhole pump. Each pump component is examined and investigated to define specific rod pump completion loading and design parameters. Related overall rod pump design considerations necessary for optimizing pump design and operation are presented. Different types of surface unit configuration geometries are presented with the positives and negative attributes of each discussed. The API rod string design method is reviewed, and two rod string designs are then conducted as exercises. Steel and fiberglass rods as well as continuous rod (Weatherford Corod™) designs are illustrated with positive and negative features highlighted. Surface dynamometer data gathering for rod pump optimization is presented.

Designed for

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

You will learn how to

- Apply the working principles and operating characteristics of oilfield reciprocating rod pump artificial lift technology
- Employ the steps necessary to design, maintain, and service rod pump surface unit equipment, rode strings, and downhole pumps
- Develop engineering and operating skills to successfully design, properly set up, maintain, and provide overall service for implementing and applying reciprocating rod pump artificial lift technology
- Design a rod pump rod string using Modified Goodman method
- Highlight the considerations and adjustments being reviewed by API regarding standards for proper consideration of rod fatigue and related corrosion effects upon rod string design
- Work several rod pump design exercises to assess maximum and minimum pump load, minimum and maximum rod stress, motor selection, strokes per minute, stroke length, and related overall rod pump design parameter selection

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Rod, PCP, Jet Pumps, and Plunger Lift [PCE-RPJ-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course will specifically describe the engineering design and operational requirements of Rod Pump, Progressing Cavity Pump (PCP), Jet Pump, and Plunger Lift well completion types.

Designed for

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

You will learn how to

- How to evaluate reservoir and well conditions to choose the appropriate artificial lift system for each set of conditions
- How rod pump, PCP pump, jet pump, and plunger lift artificial lift systems work
- How to design and optimize rod pump, PCP pump, jet pump, and plunger lift completions
- Why surveillance and monitoring of artificial lift systems is essential
- Various API and related design standards and practices that represent key, proven artificial lift system performance fundamentals

Suggested prerequisite

- Primary and Remediate Cementing [PCE-PRC-1]
- Perforating [PCE-PEC-1]

*It is recommended that the learner have previous knowledge of basic Inflow and Outflow concepts and related Nodal™ Analysis principles and applications. The Production Principles eLearning course covers Inflow and Outflow at the awareness competency level.

- "NODAL Analysis" is a trademark of Flopetrol Johnston, a division of Schlumberger Technology Corporation, and is protected by U.S. Patent #4,442.710.

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Sand Control [PCE-SCC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course illustrates various causes of sand production and its related effect upon producing systems. Alternatives that range from simply tolerating minimal sand production volumes to complex downhole and surface equipment and practices to mitigate the negative effects of sand production are presented. Basic gravel pack design is discussed, and a design problem is presented. Expandable sand screens are illustrated.

Designed for

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

You will learn how to

- Identify the need for sand control
- Recognize the causes of sand movement
- Define what consolidated sand is, and what it is not
- Identify both non-mechanical and mechanical methods of sand control
- Recognize that minor sand volume produced may be tolerated
- Identify various screen types for sand control
- Outline aspects of pre-packed screens for sand control
- Describe the principles of sand control screen and gravel completions
- Identify the three steps comprising a gravel pack completion design
- Describe various fluid options for pumping gravel slurry into a gravel pack completion
- Outline the frac pack completion well performance results
- Outline the function of an expandable sand screen completion
- Identify the components of an expandable screen and possible benefits resulting from the use of expendable

Suggested prerequisite

- Formation Damage and Matrix Stimulation [PCE-FDC-1]

This eLearning course is included in these eLearning series:

- Basic Drilling, Completions, and Workover Operations
- Completions and Workovers
- Production Operations I
- Production Technology for Other Disciplines

Sand Control Fundamentals
[PCE-SCF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	7.5 hrs

This eLearning course begins by discussing both the causes of sand production and the effects that sand production can have on our oil and gas wells. The subsequent sections describe the methods and the equipment used to control sand production. All the major types of sand control completions are discussed, along with their strengths, weaknesses, and the conditions under which they can be applied. Many new technologies have been introduced in the last several years, such as FracPacking and Expandable Screens. This eLearning course will discuss several that have been successfully applied. We will also discuss many of the more common problems encountered and how to avoid these problems.

Designed for

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

You will learn how to

- Outline the completion options for sand control
- Recognize completions with no direct downhole mechanical control devices
- Identify equipment installed downhole to control the sand
- Describe chemical methods to control sand production
- Describe many different types of screen designs used in sand control completions, with or without a gravel pack
- Describe the use of gravel packs in both openhole and cased hole completions
- Determine formation sand size distribution and why it is required to perform a successful gravel pack
- Describe the completion equipment required to place a tight gravel pack in a well
- Describe how to gravel pack horizontal wells using brines or gels
- Describe how alternate path technology can be used to ensure successful gravel packs when using gel carrier fluids
- Identify the common mistakes that reduce productivity in gravel packed wells
- Apply Darcy's law calculations to determine effects of a positive skin

This eLearning course is included in the Production Operations I eLearning series.

Special Purpose Production Logging Fundamentals
[PCE-SPP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	11 hrs

This eLearning course focuses on interpretation of special purpose production logging techniques, namely noise logging, radioactive tracer logging, and distributed temperature surveys using fiber optic cables. Noise logging principles are covered and examples of using noise logs to identify fluid entry/exit points and leaks and to distinguish single-phase from two-phase flow are given. Radioactive tracer techniques are presented, and examples are shown for calculating flow rates in shut-in and flowing wells using slug tracking and velocity shot techniques. Instrumentation is covered for fiber optic temperature measurements and some examples showing how this works are given. This eLearning course concludes with a lecture and an exercise on designing an integrated production logging program. Unlike conventional and array production logging measurements that can only sense what is happening inside the casing, noise, radioactive tracer, and temperature measurements can also sense some of what is happening behind the casing.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers, and petrophysicists who need to be able to interpret production logs or understand the production log interpretations done by others.

You will learn

- How noise and radioactive tracer logging tools work
- How to use a noise log to distinguish between single-phase flow and two-phase flow
- How to use noise and radioactive tracer log measurements to estimate flow rates, find leaks, and find fluid entry and exit points
- Know the benefits of a spectral noise log over a conventional noise log
- How fiber optic temperature measurements are made and how to interpret them to find fluid entries and fluid exits
- How to design an integrated production logging program to solve a basic production logging problem
- How to determine oil and gas holdup in the completion from pulsed neutron spectroscopy carbon/oxygen and inelastic count rate ratio measurements

* It is recommended that the learner have previous knowledge of basic open hole logging principles.

This eLearning course is included in the Production Logging eLearning series.

The Role of Production Technology
[PCE-TRP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

Any oil and gas operation has certain key, fundamental aspects and "things that must happen" for the producing asset to be properly developed or re-developed initially and to continue to perform at its optimum efficiency and profitability throughout its life. Well-defined practices and processes must be put in place. The project team and its cumulative skill set necessary to conceive and execute what must happen are essential and indispensable for any oil and gas industry organization.

This eLearning course addresses the concept of Production Technology and the production technologists who define and implement the details of managing a hydrocarbon asset. Production technologists (PTs) are subject matter experts (SMEs) across all oilfield disciplines who contribute both formally and semi-formally throughout an asset's life. Their teamwork and focus continually brings both proven oilfield practices as well as prototype emerging and new technology to fruition in a hydrocarbon exploitation development.

This eLearning course develops the context of what PTs do, how they interact, how they function in leadership roles, and presents many types of production technology applications that are envisioned, initiated, developed in detail, implemented, and managed.

Designed for

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

You will learn how to

- Define the oilfield term "Production Technology"
- Describe the technical qualities and character of subject matter experts in oil and gas organizations who are referred to as "production technologists"
- List various common responsibilities of an industry "production technologist"
- Recall two cases of well completion design (one for an unconventional shale well and the other for a conventional sandstone well) and the generic routines that a production technologist might follow in making completion design decisions

This eLearning course is included in the Production Technology for Other Disciplines eLearning series.

Well Completions Fundamentals [PCE-WCF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

This eLearning course covers five sections, including well completion equipment, packers, landing nipple and lock mandrel systems, safety valves, and circulation devices.

Designed for

Engineers within the first two years of a completions and/or workover role, Production operations staff, Service company engineers and managers, Drilling engineers, Reservoir Engineers, Field supervisors and managers, other asset team members who routinely work with completion or workover staff.

You learn how to

- Identify the functionality linked to downhole equipment
- Describe the difference between wellheads and Christmas trees
- Describe the functions of a wellhead
- Analyze a video of a wellhead, identifying the various annuli and various seals
- Describe the function of a Christmas tree
- Analyze a video of a Christmas tree video, and identify the various valves and their functions
- Identify the appropriate API standards to reference
- Identify the various characteristics of a tubing string, including weight/internal diameter, outside diameter, metallurgy, and associated properties
- Describe the main differences between API connections and premium connections
- Explain the results from a torque/turn chart
- Describe tubing and connection selection criteria
- Describe several packer setting methods
- Explain the main options for connecting the tubing to the packer
- Describe the physical basis for tubing length changes
- Calculate a simple tubing length change
- Describe the components of a landing nipple and lock mandrel system and explain why this system is used
- Identify the primary function of a safety valve
- Differentiate between a surface controlled and a subsurface controlled valve
- Design a completion, incorporating equipment, reservoir data, fluid data, etc.

This eLearning course is included in the Completions and Workovers eLearning series.

Well Intervention [PCE-WIC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course describes the operating capabilities of the main types of intervention techniques, including bullheading, slickline, electric line, coiled tubing, hydraulic workover units, and workover rigs. The general relative costs of each type of method will be discussed as well as the main operational abilities of circulating, rotating, pushing/pulling, and entering a "live" well.

Designed for

Engineers within the first two years of a completions and/or workover role, Production operations staff, Service company engineers and managers, Drilling engineers, Reservoir Engineers, Field supervisors and managers, other asset team members who routinely work with completion or workover staff.

You will how to

- Describe the main components of a/an:
  - Slickline unit
  - Braided wireline unit
  - Electric line unit
  - Conventional workover (completion) unit
  - Snubbing (hydraulic workover) unit
  - Coiled tubing unit
- Compare the critical operational benefit and/or constraints of each of these methods

This eLearning course is included in these eLearning series:

- Basic Drilling, Completions, and Workover Operations
- Completions and Workovers

Well Performance and Nodal Analysis Fundamentals [PCE-WPN-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9 hrs

This eLearning course explains the key principles in analyzing well performance parameters of any production (or injection) well using the principles and practices of NODAL™ analysis, also referenced as system analysis. Inflow and outflow equations are developed, multiphase hydraulics are reviewed, the building blocks of NODAL™ analysis are expanded, and several exercises are worked.

Designed for

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

You will learn how to

- Collect and validate required data to evaluate well performance using computer modeling, performance history matching and predict potential problems
- Calculate productivity index and estimate basic reservoir parameters by interpreting a simple pressure buildup analysis in conventional and unconventional resources plays
- Identify flow restrictions from basic inflow performance analysis, recommend actions to improve well productivity, and describe how to use choke equation calculations and its limitations

*"NODAL Analysis" is a trademark of Flopetrol Johnston, a division of Schlumberger Technology Corporation, and is protected by U.S. Patent #4,442,710.

Suggested prerequisite

- Production Principles [PCE-PPC-1]

This eLearning course is included in these eLearning series:

- Production Operations I
- Production Technology for Other Disciplines

Workover Fundamentals [PCE-WOF-2]		
STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9 hrs

The Workover Fundamentals eLearning course is designed to help you follow a workover process to solve well problems. It will allow you to witness how the process is being applied by using the process against a well problem. After understanding how the workover process is applied, you will have the opportunity to use the process with other resources and apply it to a given problem.

Designed for

Engineers within the first two years of a completions and/or workover role, Production operations staff, Service company engineers and managers, Drilling engineers, Reservoir Engineers, Field supervisors and managers, other asset team members who routinely work with completion or workover staff.

You will learn how to

- Explain the differences between a workover and intervention
- Provide examples of simple interventions
- Understand the purpose behind and importance of conducting workovers
- Identify the three general steps of a workover
- Identify tools used to recognize if well problems exist
- Understand the three basic classes of well problems with regard to their location
- Understand the “8 Basic Steps” to a workover
- Recognize the General Workover Design Sequence
- Recognize that the number of barriers and type of barriers can change during the course of a workover
- Recognize the more common workover problems
- Express questions and considerations that are needed to identify best workover solutions
- Understand an example thought process of design decisions behind correcting a casing leak
- Apply the general workover sequence to a well problem example to develop a workover procedure by utilizing techniques learned in previous sections
- Identify the methods utilized in performing the basic procedures in most workover designs, including killing a well, releasing and re-setting packers, and offloading the well
- Recognize blending of the workover checklist, the general workover sequence, and general workover principals to assist in the design of a workover
- Explain the necessity for contingency planning

This eLearning course is included in the Completions and Workovers eLearning series.

Basic Petroleum Geology – Unconventional Petroleum Resources [GEO-UPR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course introduces the petroleum geology of Unconventional Resources, which are an increasingly important part of the oil and gas industry.

The first part of the eLearning course explains the basic concepts of unconventional resources, and the key differences between conventional fields and unconventional resources. The geology and technological factors controlling productivity for unconventional resources are described, and essential operational technologies, including horizontal drilling and multistage hydraulic fracturing are discussed.

To highlight and reinforce the basic concepts of unconventional shale resource plays, the second part of the eLearning course focuses on two case studies; first, the Eagle Ford Shale Play of southeast Texas; and second, the Niobrara Shale Play of Colorado-Wyoming, as an example of a "shale hybrid play."

Designed for

Geoscientists, engineers, team leaders, geoscience technicians, asset managers, and anyone involved in Petroleum Exploration and Production who needs to understand Petroleum Geology concepts at a basic level or to communicate with others about it.

You will learn how to

- Explain what is meant by an Unconventional Resource and how it differs from a Conventional Field
- List the geologic factors controlling productivity of unconventional resource plays
- Recognize the importance of geomechanical factors, in particular, stress field orientation
- Describe key aspects of horizontal drilling and hydraulic Fracturing technologies as they relate to shale resource plays
- Explain the concept of a shale hybrid play
- Describe key technical developments that have led to increased productivity from shale plays and be cognizant of world oil and gas shale resource estimates

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Hydraulic Fracturing [PCE-HFC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

The reality is that the industry began fracking conventional gas wells in 1947 in the Hugoton Field in southwest Kansas. What is relatively new is the technology and tools which allow us to place multiple hydraulic fracture stimulations along a single lateral in a horizontally drilled unconventional well.

This eLearning course covers basic rock mechanics, stimulation design considerations, and optimum fracture length at the level. It covers both fracture acidizing and propped hydraulic stimulations. It reviews propped hydraulic fracturing for both the conventional sandstone reservoirs and unconventional shale reservoirs and explains why the techniques are different.

Designed for

Production Operations Staff, Reservoir Engineers, Facilities Staff Drilling and Completion Engineers, Geoscientists, Field Supervisors and Managers, Field Technicians, Service Company Engineers and Managers.

You will learn how to

- Describe the significance of rock mechanics in all relevant production engineering operations
- Describe the most common non-chemical stimulation methods, their objectives and limitations in conventional resource plays
- Describe the most common non-chemical stimulation methods, their objectives and limitations in unconventional resource plays
- Describe the basic principles of hydraulic fracturing in conventional plays, the difference between acid and proppant treatments, and how to select optimum stimulation candidates
- Describe the basic principles of hydraulic fracturing in unconventional resource plays, the difference between slickwater and cross-linked treatments, and how to select optimum stimulation candidates

Suggested prerequisite

- Formation Damage and Matrix Stimulation [PCE-FDC-1]

This eLearning course is included in these eLearning series:

- Completions and Workovers
- Production Operations I

Introduction to Reservoir Geomechanics and its Application [PPH-IPG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This introductory eLearning course is designed to familiarize the learners with reservoir geomechanics, its fundamentals and terminology along with exploring methodologies used for solving problems associated with different subsurface operations.

Designed for

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

You will learn how to

- Recognize the significance of rock mechanics and petroleum geomechanics in development of hydrocarbon resources and other subsurface operations
- Identify applications of geomechanics for optimization and risk mitigation for several different subsurface operations
- Use the basic terminology of petroleum geomechanics eg, in-situ stresses, pore pressure, failure criteria, constitutive models, fracture networks, and several other terms
- Describe the basic principles of rock mechanics and its problem-solving techniques for different geomechanical problems such as borehole stability, sand production, compaction and subsidence, caprock integrity, hydraulic fracturing and more

This eLearning course is included in these eLearning series:

- Introduction to Geomechanics for Unconventional Reservoirs
- Unconventional Reservoir Geoscience and Engineering

Introduction to Unconventional Reservoirs
[RES-IUR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course introduces the Unconventional Reservoir Engineering set of eLearning courses. It introduces the basic terminology of all the disciplines and discusses the fundamental reservoir characterization techniques. Also covered are the basics of reservoir management and integrated teamwork and how they are essential to proper field development.

Designed for

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types.

You will learn

- What types of unconventional reservoirs exist
- How they are different from conventional reservoirs
- How the geologic characterization is different from conventional reservoirs
- How reservoir management is different from conventional reservoirs
- How reservoir enhancement is different from conventional reservoirs
- How reservoir surveillance is different from conventional reservoirs
- How reservoir evaluation is different from conventional reservoirs
- What constitutes a “sweet spot” in unconventional reservoirs

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Seismic for Unconventional Reservoirs
[GEP-SUR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course is designed to familiarize anyone using seismic data with how seismic data is used to explore and develop unconventional reservoirs. One key goal of this course is to explain the large and confusing amount of jargon used by the geophysical community when using seismic data.

Designed for

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

You will learn how to

- Identify rock physics for shale reservoirs
- Describe seismic analysis for unconventional reservoirs
- Describe microseismic, including surface and subsurface recording arrays
- Describe source (event) recording and location detection
- Describe three component recording
- Identify the role of Hodograms in source orientation
- Identify the importance of microseismic monitoring in different stress areas

This eLearning course is included in these eLearning series:
- Basic Geophysics
- Unconventional Reservoir Geoscience and Engineering

Unconventional Reservoir Analysis
[RES-URA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, you will learn the fundamental ways that various well tests and production analyses are applied to unconventional reservoirs. Diagnostic Fracture Injection Tests (DFITs), Diagnostic Plots, Rate Transient Analysis (RTA), Decline Curve Analysis (DCA) are all historic production rate and pressure analysis tools that are being applied to unconventional reservoirs. The fundamental principles will be reviewed before the Unconventional Reservoir Analysis Fundamentals eLearning course covers the application skills. Additionally, the fundamental principles of Reserves and Resource management will be covered.

Designed for

All petro-technical professionals who have little experience with unconventional reservoirs but who need or desire to start developing some understanding of important basic concepts and methods associated with these resource types.

You will learn

- What a DFIT, RTA, DCA analysis is
- How to read a Diagnostic Plot
- Why the analysis of these techniques is different in unconventional reservoirs
- Fundamental principles of reserves and resource management

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Analysis Fundamentals [RES-URA-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	9.5 hrs

This eLearning course is designed for professional engineers and geoscientists with a basic understanding of unconventional rocks and fluids and the drilling and completion of horizontal laterals who wish to quickly learn single well analysis techniques, including the key elements of these reservoirs and the technologies to exploit them. Diagnostic plots to identify flow regimes and rate transient analysis (RTA) to understand individual well performance are discussed. Field-level topics include field development and reservoir surveillance. Decline curve analysis (DCA) for individual wells is presented, followed by reserves and resources estimations in unconventionals, primarily under the Petroleum Resources Management System (PRMS) guidance. Attendees should leave this course with the tools to understand individual well behavior as well as field planning and development in the reservoirs which supply an ever-increasing fraction of the world's oil and gas, unconventional reservoirs.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn how to

- Calculate volumetric estimates in unconventional reservoirs
- Apply material balance analysis with corrections for unconventional reservoirs
- Calculate properties from DFIT's
- Calculate drainage volumes from rate transient analysis
- Match historical data and forecast future production using statistical tools adjusted for unconventional reservoirs

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Properties [RES-URP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course examines the key parameters and how they are measured to understand unconventional reservoir rock properties. Organic, rock, and mechanical quality factors are defined, and various measurement techniques are described, along with an understanding of the uncertainty ranges associated with those measurements.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn

- Specifics about how organic, rock and mechanical quality is quantified
- Why each factor is important in the understanding of unconventional reservoirs
- The difference between Tight Gas Sands and Shale Reservoirs
- Uncertainties in Well and Laboratory measurements of Rock Properties

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Unconventional Reservoir Properties Fundamentals [RES-URP-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course is designed for professional engineers and geoscientists with little experience in unconventional reservoirs who wish to quickly learn the key elements of these reservoirs and the technologies to exploit them. Focused on shale (tight) oil, tight gas, and coalbed methane, this course begins with an introduction to unconventionals then reviews geoscience elements from the previous eLearning courses and demonstrates their use in unconventional reservoir engineering. Fluid sampling for laboratory tests and fluid property correlations are presented. Drilling and completion of wells in unconventional reservoirs are considered, with a focus on horizontal wells. Stimulation fluid systems and proppants are briefly discussed. A key test for stimulation design, diagnostic fracture injection tests (DFIT's) is presented along with classic test signatures. Attendees should leave this course with a better understanding of the basic physics of unconventional reservoirs and the fluids they hold as well as the basics of placing wells in those reservoirs to drain those fluids.

Designed for

Subsurface technical professionals, geoscientists, completion engineers, reservoir engineers, petroleum engineers, and drilling engineers.

You will learn how to

- Manage the difference between unconventional and conventional fluids
- Develop relationships between rock properties and well performance
- Calculate flow rates under conditions in which fluid models break down
- Use simulated rock volumes and discrete fracture networks

Suggested prerequisite

• Unconventional Reservoir Properties [RES-URP-1]

This eLearning course is included in the Unconventional Reservoir Geoscience and Engineering eLearning series.

Contaminant Removal – Gas Dehydration
[GAS-CRD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course provides an overview of processes used to dehydrate natural gas with specific emphasis on (1) absorption using glycol dehydration and (2) adsorption using molecular sieve.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- List the three most common gas dehydration options used in oil and gas processing
- Identify typical applications
- Describe the advantages and disadvantages of each
- Describe the components and process flow in a typical glycol dehydration unit
- State the typical TEG circulation ratios for a glycol dehydration system
- Determine the minimum lean TEG concentration required for a given water removal requirement
- Calculate the volumetric TEG circulation rate based on a given water removal requirement
- Describe the effect of the number of trays or height of packing on the contactor performance
- Describe the sizing parameters for the contactor and regeneration system
- Describe the co-absorption BTEX, H2S, CO2 and the TEG, and list the methods to mitigate emissions
- Explain the process of adsorption
- List the common adsorbents used in gas dehydration
- Describe the typical adsorption dehydration cycle for a molecular sieve unit
- Describe the factors that cause the useful capacity of the sieve to be less than the new equilibrium capacity
- List the parameters that affect the sizing of the adsorber vessels
- Describe the mol sieve regeneration process and factors that affect its design and operation

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Contaminant Removal – Acid Gas and Mercury Removal
[GAS-CRA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course explains the processes of removing mercury and acid gases from a natural gas stream. The eLearning course also describes the basic amine process flow diagram (PFD) and explains the advantages of using MDEA for removing H2S but leaving CO2 in the gas stream. Also discussed are when to use a Claus sulfur recovery unit (SRU) and a tail-gas-clean-up unit (TGCU) versus acid gases injection and why liquid product treating may be required.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Explain why mercury is removed from a natural gas stream, and list two common mercury absorbents
- List the process options for acid gas removal from a natural gas stream
- Describe a basic amine process flow diagram
- Estimate the amine circulation rate, regenerator reboiler duty, and circulation pump power for an AGRU
- State the conditions where a physical solvent may be advantageous over an amine solvent for acid gas removal
- List examples where it may be advantageous to selectively remove H2S from a gas stream but leave some or all of the CO2 in the gas
- Describe the process flow diagram for a standard Claus sulfur recovery unit (SRU)
- Explain why a tail-gas-clean-up unit (TGCU) may be required, and list processes that may be applied
- Describe why liquid product treating may be required, and provide examples of common processes used
- List the advantages of acid gas injection over installation of an SRU and TGCU

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Fluid Flow
[GAS-FFC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course discusses the flow of fluid through a pipe segment. Single phase and multiphase flow are explored. In addition, simple correlations are used to estimate important fluid flow parameters.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Explain Bernoulli's equation, including how to estimate and apply the friction factor
- Describe the difference between Newtonian and non-Newtonian fluids
- Explain economic pipe diameter and describe typical velocity and pressure drop guidelines for sizing piping systems
- Calculate fluid velocity and estimate the pressure drop in a plant piping system using simple correlations
- Describe common gas transmission pipeline flow correlations and their applications
- Describe the parameters that affect heat transfer for various piping systems
- Describe the most common flow regimes in multiphase flow systems
- Explain the difference between liquid hold-up and liquid volume fraction and list factors that affect their value
- Describe common slugging mechanisms and list methods to limit or reduce the impact of slugging events
- Describe erosional velocity and explain how it can be estimated for various systems

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Heat Transfer Equipment
[GAS-HTE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course provides an overview of the heat transfer equipment and mechanisms commonly used in the oil and gas industry. The eLearning course also provides an overview including advantages, disadvantages, and applications of different types of heat exchangers.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Identify types of heat exchangers and common applications in oil and gas processing facilities
- Describe heat transfer mechanisms: conduction, convection, and radiation
- Define heat transfer coefficient and describe the primary parameters that affect its value
- Describe the rate equation used to calculate heat transfer area
- Describe the “effective temperature difference” and explain how it affects heat transfer area
- Estimate heat transfer surface area required for a heat exchanger application
- Describe shell and tube exchanger types and applications
- Describe compact heat exchangers and fired heaters
- List the four primary process cooling (heat rejection) methods
- Describe why air-cooled heat exchangers are so frequently used, key operating parameters, and the difference between induced draft and forced draft designs

This eLearning course is included in these eLearning series:
- Gas Conditioning and Processing Principles
- Basics of Static Mechanical Equipment

Hydrocarbon Components and Physical Properties
[GAS-HCP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course describes the basic terminology and hydrocarbon nomenclature commonly used in the oil and gas industry. This eLearning course also explains methods used to determine hydrocarbon fluid composition and approaches to and implications of the characterization of heavy hydrocarbons (C6+) in mixtures.

This eLearning course also demonstrates how to estimate hydrocarbon physical properties (density and viscosity) for both liquids and vapors, including their purpose and use as applied in facilities engineering calculations.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Describe the concept of atomic mass, molecular mass, and the mol
- Identify the four main hydrocarbon groups
- Practice the concept of relative density
- Discuss how a gas chromatograph works, the limitations of various analysis methods, and the difference between an extended analysis and a standard gas chromatographic analysis
- Recognize the uncertainties involved with characterizing the C6+ components in a natural gas, condensate or crude oil stream, and describe the relationship of these factors with hydrocarbon liquid composition
- Describe an Equation of State, its purpose and uses
- Define standard (normal) conditions for SI and FPS units, and calculate the molar volume at these conditions
- Describe the gas compressibility factor and use it to calculate gas density
- Define the property “viscosity”, list applications where it is used, and describe correlations that can be used to predict its value
- Estimate the density of a hydrocarbon liquid at a specified temperature and pressure

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Introduction to Production and Gas Processing Facilities
[GAS-IGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course provides an overview of production and gas processing facilities. The concepts addressed in This eLearning course include: 1) the crude oil and natural gas value chains, 2) common contaminants in production streams, 3) crude oil, produced water and natural gas quality specifications, 4) typical production facility and gas processing schemes, and 5) NGL products the economics of their recovery. Knowledge of these basic concepts is critical to understanding the selection and specification of processing facilities between the wellhead and product markets.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- State typical crude oil and produced water specifications
- Describe process flows for each stream in production facilities
- List problems associated with and strategies to deal with solids production, e.g., sand, wax, asphaltenes
- List the components, including contaminants, found in produced gas streams
- State typical natural gas sales or transportation specifications
- Calculate higher heating value and Wobbe number
- List the products of a typical natural gas processing plant, their associated markets, and describe common terminology
- Describe typical process flows for each stream in gas processing facilities
- Explain the difference between gas conditioning to meet a HCDP specification and gas processing to recover NGLs
- Describe shrinkage and how it is calculated

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Pumps and Compressors
[GAS-PCC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course provides an overview of types of pumps and the basic principles and criteria that apply to all pumps. The emphasis is on process-type pumps used in surface facilities. The concepts of cavitation, Net Positive Suction Head Required (NPSHR), and Net Positive Suction Head Available (NPSHA) are also discussed. The second focus of this course is compressors, including their applications, types, and selection criteria. The course ends with a discussion of the principles of operation of the various types of compressors.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Identify types of pumps and common applications in oil and gas processing facilities
- Describe how a pump selection chart can be used to select pump type
- Explain the relationship between head and pressure
- Calculate the pump power requirement
- Describe the differences in performance characteristics of centrifugal and positive displacement pumps
- Explain the principle of operation of a single stage centrifugal pump, and identify the main pump components
- Describe the system head curve and explain how it affects pump selection
- Explain the principle of operation of plunger pumps, common configurations, and identify the main pump components
- Describe how a compressor selection chart can be used to select compressor type
- Explain the relationship between compressor head and pressure
- Calculate the compressor power requirement
- Estimate the compressor discharge temperature
- Explain the principle of operation and identify the main compressor components of: 1) centrifugal compressor, 2) reciprocating compressor, and 3) rotary screw compressor
- Describe a centrifugal compressor performance curve, and identify and describe the surge line and stonewall

This eLearning course is included in these eLearning series:
- Gas Conditioning and Processing Principles
- Basics of Rotating Mechanical Equipment

Qualitative Phase Behavior and Vapor-Liquid Equilibrium
[GAS-QPB-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course describes the phase or phases that exist at given conditions of pressure and temperature of single and multi-component systems. The eLearning course also explains the concepts of critical point, cricondentherm, cricondenbar, dense phase, and retrograde condensation. In addition, the eLearning course explains how to perform bubble point, dew point, and flash calculations, and describes how to stabilize hydrocarbon liquids using stage separation.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Describe pure component phase behavior
- Describe multicomponent phase behavior and phase envelopes
- Define critical point, cricondentherm, cricondenbar, dense phase, and retrograde condensation
- Summarize the effect of C6+ characterization on the shape of the phase envelope
- Recognize the effect of various non-hydrocarbon components on the shape of the phase envelope
- List examples of fundamental applications of phase envelopes in facilities design and operations
- Explain the concept of equilibrium vaporization ratio, K
- List the common methods of estimating K values
- Describe flash, bubble point, and dew point calculations and list examples of their application
- Describe the effect of composition on bubble point, dew point, and flash calculations for a hydrocarbon mixture
- Describe stabilization of hydrocarbon liquids using stage separation
- Summarize the differences between Reid Vapor Pressure (RVP) and True Vapor Pressure (TVP)

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Refrigeration, NGL Extraction, and Fractionation
[GAS-RNG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course explains the concepts of mechanical refrigeration, valve, and turbine expansion, and NGL extraction systems. The eLearning course also explains the process of fractionation in oil and gas operations.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- List the most common applications of refrigeration in oil and gas processing
- Review the operation of a mechanical refrigeration system, and describe the effect of condenser and chiller temperature on compressor operation and energy consumption
- Explain why economizers are commonly used in mechanical refrigeration systems
- Describe factors that are considered in selection of a refrigerant, and explain cascade refrigeration and why it is used
- Explain the operation of expansion refrigeration processes (valve and turboexpander)
- List the common process configurations for the different levels of NGL extraction (including HCDP control)
- Understand the difference between stage separation and fractionation
- Define relative volatility and how it affects the difficulty of separation
- Explain how a fractionator (distillation column) separates components, and describe the operation and purpose of the reboiler, condenser, reflux accumulator, and pump
- List types of internals used in fractionators to achieve mass transfer, and describe their advantages and disadvantages

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Separation
[GAS-SEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course describes separators, their use and application, in the oil and gas industry. The principle of gas-liquid and oil-water separations are discussed along with separator sizing. This eLearning course also explains what emulsions are, how they form, and their influence on separator design. Also discussed are methods and equipment used to destabilize and eliminate emulsions.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Describe separator applications and common types of separators
- List the sizing criteria for 2-phase and 3-phase separators
- Discuss the principles of gas-liquid separation and how they are applied in separator design
- Describe the effect of inlet piping size and inlet devices on separator sizing
- List the types of mist extractors and describe typical applications
- Estimate separator size based on gas-liquid separation criteria
- Describe emulsions, how they form, and how they influence separator design
- Discuss how emulsions can be destabilized and eliminated
- Estimate the size of an oil dehydrator based on liquid-liquid separation criteria

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Thermodynamics and Applications of Energy Balances
[GAS-TAE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course provides an overview of the concepts of thermodynamics, which is the foundation for all processing calculations. This eLearning course explains the first and second law of thermodynamics and their application in facilities. Also covered are applications of energy balance equations, the concepts of enthalpy and entropy, and an explanation of how to use P-H diagrams to perform calculations on a simple refrigeration system.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Define the terms system and surroundings and explain the difference between open and closed systems
- State the first law of thermodynamics and how it is applied to facilities
- Describe the second law of thermodynamics, and explain how it is applied to facilities
- Write the energy balance equations for a heat exchanger, valve, separator, and compressor
- Calculate the duty of a heat exchanger where no phase change occurs and also for an exchanger where a phase change does occur
- List methods used to estimate enthalpy and entropy
- Describe a P-H diagram and use it to perform calculations on a simple refrigeration system

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Water/Hydrocarbon Phase Behavior
[GAS-WHP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course describes hydrates, explores conditions favoring hydrate formation, and discusses how to prevent hydrates from forming. The eLearning course also describes how to estimate the hydrate formation temperature of a natural gas stream and the key differences between low dosage hydrate inhibitors and thermodynamic inhibitors.

Designed for

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers.

You will learn how to

- Estimate the water content of sweet and sour natural gas
- Describe the conditions that favor hydrate formation
- Estimate the hydrate formation temperature of a natural gas stream
- Compare and contrast the use of MeOH and MEG to prevent hydrate formation
- Describe the differences between low dosage hydrate inhibitors and thermodynamic inhibitors

This eLearning course is included in the Gas Conditioning and Processing Principles eLearning series.

Combustion Behavior of Hydrocarbons [PRS-CBH-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course covers combustion behavior of hydrocarbons. It will review vocabulary, concepts, and the factors that drive calculations regarding combustion behavior.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- The fundamentals of flammability and flammable limits typical of hydrocarbons
- The characteristics of hydrocarbon fires and explosions
- Essential variables in calculations of typical fire and explosion scenarios

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Controls and Safety Instrumented Systems Fundamentals [PRS-CSI-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

This eLearning course extends the learning from the SIS, Monitoring, and Control eLearning course. There will be some sizing calculations and discussion of common instrumentation and types of control valves, with their advantages and disadvantages. Learning will be applied to the example facility. There will be two interactive sessions with discussion of applications chosen by course participants.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Explain control valve sizing and selection for some common applications
- Explain the advantages, disadvantages, and typical applications of commonly used instrumentation
- Explain the application of commonly used process control techniques
- Explain how a Safety Instrumented System (Emergency Shutdown System) is applied in facility design, using the logic which was introduced in the eLearning course
- Apply the learning to the example facility

Suggested prerequisite

- SIS, Monitoring and Control [PRS-SIS-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Fire Protection Systems [PRS-FPS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, you will learn about the main fire protection strategies, passive and active protection, fire water and foam applications, fireproofing materials, and the use of drainage, containment, and remote impounding in prevention and mitigation of fire and explosion.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- The intent of fire protection
- Passive fire protection options
- Active fire protection options
- Basic principles and applications of explosion protection systems

This eLearning course is included in these eLearning series:

- Process Safety Engineering Principles
- Basics of Static Mechanical Equipment

Flow Assurance Fundamentals for Surface Facilities [PRS-FLA-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4 hrs

This eLearning course reviews the typically employed sand control/ mitigation options, and the key issues associated with the oil desanders. It also discusses what wax, asphaltene, and scales are, the problems caused, and how to mitigate them will be described. This eLearning course covers the following topics:

- Sources of sand and typical characteristics in surface production facilities
- Problems resulting from sand production
- Sand detection equipment options and applications
- Sand control/mitigation and disposal options
- Wax in crude oil systems and associated operational issues
- Asphaltenes in crude oil and associated operational issues
- Scale and scale control options in oil production facilities

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe what is oil treating and why it is important
- List typical sales oil specifications
- Outline typical emulsion heating methods and their applications
- Describe design parameters, treating temperature, treating flux, heat flux, and heat release density
- Perform basic sizing of a heater treater
- Describe chemical demulsifiers, what are they and how they destabilize and eliminate emulsions
- List the key factors and criteria considered for selection of chemical demulsifiers
- Estimate demulsifiers injection rate and cost
- Explain how electrostatic treaters work and what their advantages are over other treating methods
- List different types and typical configurations
- Perform basic sizing of an electrostatic treater
- Describe the main desalting process configurations, i.e., process flow diagrams, major equipment, etc.
- List the main steps involved with desalting
- Outline the primary applications of the main desalting configurations
- Identify typical problems encountered in desalting operations, their causes, and solutions

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Gas, Oil, and Water Composition and Properties [PRS-GOW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course identifies the typical compositions of gas, oil, and produced water and describes how to determine the physical and thermal properties using charts or simple correlations. Knowing compositions and how to estimate thermal and physical properties are essential to size, evaluate, and troubleshoot the required equipment for processing the fluids from the well to meet sales, transportation, or disposal specifications.

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Practice the concept of relative density of a gas, liquid
- Practice converting from standard gas volumetric flow to mass flow
- Practice converting liquid volumetric flow to mass flow
- Describe the concept of atomic mass, molecular mass, and mol
- Identify the four main hydrocarbon groups
- Describe an Equation of State, its purpose and uses
- Describe the gas compressibility factor, and use it to calculate gas density
- Define the property “viscosity”, list applications where it is used, and describe correlations that can be used to predict its value
- List the methods available to estimate hydrocarbon liquid density
- Estimate the water content of sweet and sour natural gas
- Discuss the difference between an extended analysis and a standard gas chromatographic analysis
- Recognize the uncertainties involved with characterizing the C6+ components in a natural gas, condensate or crude oil stream, and describe the relationship of these factors with hydrocarbon liquid composition
- Identify the typical compositions of crude oil
- Describe the physical and thermal properties of crude oil that are most used in facilities work and describe how the properties are determined
- Identify the typical composition of brine water
- Describe the physical and thermal properties of brine water that are most used in facilities engineering work, and explain how these properties are determined

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Gas-Liquid Separation Fundamentals [PRS-GLS-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4 hrs

This eLearning course will review practical aspects of oil gas separation systems, sizing of vertical and horizontal separators, and the key issues associated with gas-liquid separation systems, including feed pipe, inlet devices, mist extractors, etc. This eLearning course covers the following topics:

- Principles of Gas-Liquid Separation
- 2-Phase Separators
- Mist Extraction Devices
- Vertical and Horizontal Separators

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe the different kinds of gas-liquid separation equipment typically encountered in oil and gas facilities and applications for each type
- Review the various components of different gas-liquid separation equipment types and their function
- Describe typical gas-liquid equipment separation performance criteria and their basis
- List the fluid properties and operating conditions needed to perform gas-liquid separation equipment selection and sizing
- Outline gas-liquid separator sizing fundamentals

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Historical Incident Databases, Plant Layout, and Equipment Spacing [PRS-HID-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course deals with Historical Incident Databases, Process Safety Metrics, and the layout of operating facilities at the basic level.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- Terminology related to historical incident databases (HIDs) and process safety metrics
- How process safety metrics are related to HIDs
- Why and how HIDs are used
- Findings from a few readily available HID sources, including Duguid and UKHSE
- Where site selection and layout fit into the normal design sequence
- The main safety considerations and other criteria in site selection and layout
- Application of industry spacing guidelines

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Historical Incident Databases, Metrics, and Specific Facilities (Bad Actors) Fundamentals [PRS-HID-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4 hrs

This eLearning course extends the learning from the eLearning courses to the Fundamental level, using applications of the learning to an example facility as the primarily learning reinforcement tool. There are several short evaluations, and two interactive sessions to discuss the applications developed by course participants.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- Applications of HID
- Criteria for sizing flare headers
- Identify potential process safety incidents at the example facility by considering specific systems and equipment (Bad Actors)

Suggested prerequisites

- Historical Incident Databases, Plant Layout, and Equipment Spacing [PRS-HID-1]
- Specific Plant Systems and Equipment [PRS-SPS-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Leakage and Dispersion of Hydrocarbons [PRS-LDH-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course covers accidental leaks and calculating concentration and dispersion of those leaks. This eLearning course also discusses how calculations can be made to keep people safe from exposure to leaks and what the risks are when working around hazardous materials.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Detect the conditions in which accidental release can occur, and identify the factors that affect the amount of release
- Assess gas and liquid leak rate equations
- Estimate vapor cloud size
- Describe the factors associated with gas dispersion
- Analyze the risks of hydrogen sulfide and oxygen deficiency on people
- Estimate downwind concentration of a leaked gas
- Estimate probability of fatality from exposure to a material
- Assess probit function and estimate probability of fatality using the function

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Leakage and Dispersion, Combustion Behavior, Sources of Ignition Fundamentals [PRS-LDC-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

This eLearning course extends the learning in the corresponding three eLearning courses to the Fundamental level, using a combination of exercises and readings with two interactive sessions.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- Estimation of hydrocarbon behavior on loss containment
- Identification of common ignition sources
- Estimation of hydrocarbon behavior following ignition

Suggested prerequisites

- Leakage and Dispersion of Hydrocarbons [PRS-LDH-1]
- Combustion Behavior of Hydrocarbons [PRS-CBH-1]
- Sources of Ignition and Hazardous Area Classification [PRS-SIH-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Oil Gathering Systems Fundamentals [PRS-OGS-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2.5 hrs

This eLearning course describes typical oil gathering system configurations from the wellhead to the central processing facility – onshore and offshore, including well test satellites, piping arrangements, and multiphase flow fundamentals. Also, the Beggs and Brill correlation is utilized to gathering system line sizing, estimate the hydrodynamic slug size using the Scott correlation, and apply the Flannigan correlation to determine the liquid hold up in an oil gathering line.

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe typical oil gathering system configurations from the wellhead to the central processing facility – onshore and offshore
- Outline typical wellhead piping arrangements – onshore and offshore
- Explain the purpose and operation of a typical well test satellite, and example configurations and components
- Discuss multiphase flow fundamentals, basic flowline sizing methods, and operational issues

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Oil Stabilization, Sweetening, Storage, and VRU Crude Fundamentals [PRS-OSV-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3 hrs

This eLearning course will provide you with the principles of fractionation stabilization to achieve high quality condensate or crude oil, to maximize the revenue potential of your facility. The options for tank storage of this product will be reviewed to ensure the correct volumes are in place for process upsets, at the lowest capital and operating cost. Emissions from the tanks, a growing concern worldwide will be examined, focusing on vapor recovery units to monetize the gases, while providing safety protection to the tankage from over and under pressure excursions. The Engineering Principles reviewed will help you to examine your facility/design for opportunities to make more revenue, reduce operating costs and reduce fugitive emissions.

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Explain what crude oil stabilization is
- Describe the purpose of stabilization
- Identify typical stabilized crude specifications, e.g., RVP/TVP, and their basis
- Describe the commonly used processes for stabilizing crude oil, including the equipment involved and typical operating conditions
- Identify and explain the purpose and operating conditions of the major equipment items used in the various stabilization processes
- Describe typical processes, equipment and operating conditions used for removing H2S from crude oil
- Describe the main types of aboveground storage tanks used for crude oil storage and their applications
- List the different floating roof types and their applications
- Describe the evaporative emissions aspects of the different storage tank types
- Describe the different types of floating roof rim seals and their applications
- Explain how a Vapor Recovery Unit works and where it is used

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Oil Treating and Desalting Fundamentals
[PRS-OTR-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5.5 hrs

This eLearning course reviews the various types of oil treating equipment available and their applications, and the key issues associated with the oil treater systems. It also covers main desalting process configurations, i.e., process flow diagrams, major equipment, etc. This eLearning course covers the following topics:

- Oil treating overview
- Oil treating methods: application of heat, chemical demulsifiers, retention time, electricity, mechanical devices
- Desalting crude oil material
- Desalting crude oil process configurations

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe what is oil treating and why it is important
- List typical sales oil specifications
- Outline typical emulsion heating methods and their applications
- Describe design parameters; treating temperature, treating flux, heat flux, and heat release density
- Perform basic sizing of a heater treater
- Describe chemical demulsifiers, what are they and how they destabilize and eliminate emulsions
- List the key factors and criteria considered for selection of chemical demulsifiers
- Estimate demulsifiers injection rate and cost
- Explain how electrostatic treaters work and what their advantages are over other treating methods
- List different types and typical configurations
- Perform basic sizing of an electrostatic treater
- Identify the two gravitational treating units
- Describe pros and cons of gravitational treaters
- Explain the purpose of crude oil desalting
- Describe the main desalting process configurations, i.e., process flow diagrams, major equipment, etc.
- List the main steps involved with desalting
- Outline the primary applications of the main desalting configurations

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Oil-Water Separation Fundamentals
[PRS-OWS-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3 hrs

This eLearning course describes the characteristics of three-phase separators and discusses the methods used for oil-water separation. The following key concepts are covered in this eLearning course:

- Emulsions
- Stokes' Law
- Oil dehydrators
- Three-phase separation

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe emulsions, how they form, and how they influence separator design
- Discuss how emulsions can be destabilized and eliminated
- Describe Stokes' Law and explain the influence of its Key Parameters on the Oil-Water separation
- Estimate the settling velocity of water in three cases of Condensate, Heavy Oil, and Emulsion with different viscosity values
- Discuss how emulsions can be destabilized and eliminated to achieve the Basic Sediment and Water specifications
- Estimate the size of an oil dehydrator based on liquid-liquid separation criteria
- Describe separator applications and common types of 3-phase gas liquid-liquid separators
- List the sizing criteria for 2-phase and 3-phase separators
- Discuss the principles of gas-liquid-liquid separation and how they are applied in separator design
- Compare the residence time and droplet settling methods and discuss their application

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Overview of Reservoir Engineering for Facilities Operations
[PRS-REF-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course provides an overview of four topics that describe how petroleum fluids initially flow from within the reservoir porous rocks to the surface facilities naturally and later by using artificial lift when the reservoir pressure declines and leaving a significant amount of petroleum fluids underground.

To maximize oil production rate and minimize operating costs, this eLearning course covers the following topics:

- Reservoir traps, rocks, and drive mechanisms
- Reservoir fluid classification and phase envelopes
- Inflow performance relationship
- Artificial lift

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe the different types of reservoir traps, different types of rocks, and identify the rock type that normally holds oil and gas, the meaning, significance, and typical values of porosity and permeability
- Estimation of reservoir temperature and pressure, and how this information impacts surface facilities design and operation ·
- Impact of reservoir drive mechanism on production profiles, equipment selection, and sizing
- Describe the five main reservoir fluid types, their typical compositions and characteristics, and provide examples of how the reservoir fluid phase envelopes and impacts surface facilities' design and operation
- Explain how the various reservoir fluids affect the phase envelope for specific reservoirs and their impact on surface facilities
- Define "artificial lift", discuss the different types, their pros and cons, and applications, and provide examples of how artificial lift method selection can impact surface facilities design and operation
- Estimate system pressure losses for "artificial lift" applications

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Overview of Solution Gas Handling Fundamentals [PRS-OSG-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3.5 hrs

This eLearning course reviews the main gas processing operations; what they are, why they are needed, how they work, and the key issues associated with gas processing systems.

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe the main compressor types and their applications
- Perform a compressor power calculation
- Outline typical sales gas specifications
- Describe the main gas processing operations, what they are, why they are needed, and how they work for:
  - Gas sweetening
  - Gas dehydration
  - NGL recovery

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

PHA Techniques and LOPA Fundamentals [PRS-PHA-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8 hrs

This eLearning course builds on Process Hazards Analysis techniques and Layers of Protection from the eLearning course. It includes an in-depth look at each of the topics listed and two interactive sessions.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Select appropriate PHA methods, including HAZOP and API 14C
- Identify suitable applications for LOPA

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Process Hazards Analysis and Layers of Protection Analysis [PRS-PHA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course addresses Process Hazards Analysis (PHA) and Layer of Protection Analysis (LOPA). It will cover PHA definitions, concepts, and techniques, as well as the definition and purpose of LOPA and the LOPA procedure.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- The purpose, premise, and scope of a PHA
- PHA methodology, including HAZOP and API14C
- The differences between methods, including benefits and disadvantages
- The purpose and steps of a LOPA procedure
- The role of independent protection layers and conditional modifiers in LOPA

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Process Safety Risk Analysis and Inherently Safer Design [PRS-PSR-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course provides basic concepts and definitions needed to better understand and utilize Process Safety and Inherently Safer Design. This eLearning course also includes various models, strategies, and examples to better analyze and reduce risk and apply Inherently Safer Design.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn

- How to analyze and assess different types of risk analyses
- How to utilize models that are associated with risk management
- The importance of building safety into processes
- How Inherently Safer Design can be applied

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Produced Water Treatment Fundamentals (PRS-PWT-2)

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5 hrs

This eLearning course introduces the technologies which govern the design and performance of Produced Water Treatment (PWT) systems. An important objective is to provide information and knowledge which a petroleum engineer needs to select and operate effective water treatment equipment. The eLearning course provides the engineer with both fundamental and practical knowledge that is needed to understand how and why specific technologies are included in a water treatment system and to evaluate or improve their performance. An overview of generic onshore and offshore PWT processes provides the focus for summarizing the configuration of "typical" water treatment systems.

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Explain the technologies that govern the design and performance of produced water treatment systems
- Explain the basic chemistry and unique characteristics of produced water, dissolved gases, dissolved minerals, dissolved and dispersed hydrocarbons, extraneous chemicals, etc.
- Define retention time, fluid velocity, nozzle sizing, inlet device design (cyclonic inlets), and outlet nozzle vortex control for primary separators
- Identify where, why, and how deoiling hydrocyclones are used for produced water treatment
- Define the designs, operating principles, capabilities, and weaknesses of dissolved gas flotation, induced gas flotation, and mechanical flotation
- Explain the operating principles for nutshell media bed filtration
- Describe the basics of membrane filtration technology
- Define the common methods for oilfield water disposal/injection
- Explain how to use Silt Density Index (SDI), NACE TMO-173 filtration tests, TOG measurements, and/or TSS measurements to define water quality
- Discuss the purposes and capabilities for the seawater injection system's front-end technologies
- Identify the basic configuration of the media bed filter's internals and the operating parameters for multi-media and nutshell media filters

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Relief and Flare Systems [PRS-RFS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

In this eLearning course, you will learn about causes of overpressure, the different types of relief valves and their applications, depressurization, and flare systems.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Understand the typical causes of overpressure
- Identify the different types of relief devices and their applications
- Describe the purpose and operation of a depressurization system
- Identify major components of a flare system and describe their purpose

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Relief, Flare, and Depressurization Fundamentals [PRS-RFD-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course extends the learning from the corresponding eLearning course to the Fundamental level. There are quantitative and non-quantitative exercises, and proposed applications at the example facility. There will be two interactive sessions that will include discussions of applications developed by the course participants.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Size a relief valve for vapor service
- Size a relief valve for liquid service
- Describe how to calculate the relief load due to full bore failure of a heat exchanger tube
- Calculate inbreathing and outbreathing for atmospheric tanks
- Identify the key sizing parameters for flare headers and depressuring systems

Suggested prerequisite

• Relief and Flare Systems [PRS-RFS-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Risk Analysis and Inherently Safer Design Fundamentals [PRS-RAI-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	8.5 hrs

This eLearning course builds on risk analysis and inherently safer design from the Process Safety Risk Analysis and Inherently Safer Design eLearning course. It includes an in-depth look at each of the topics listed and two interactive sessions.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Select and apply common methods of risk analysis
- Identify opportunities for use of ISD at different stages of facility life cycle

Suggested prerequisite

- Process Hazards Analysis and Layers of Protection Analysis [PRS-PHA-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

SIS, Monitoring and Control [PRS-SIS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course is comprised of two sections, Safety Instrumented Systems (SIS) and Monitoring and Control. Within this eLearning course, you will find multiple control method examples and the concepts of SIL and SIF, and a case study that highlights the eLearning course.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Define and explain process control
- Identify the process safety instrumentation goals
- Identify and discuss the methods of control
- Describe the elements of feedback, cascade, and feedforward control
- Explain control modes and the elements of alarm philosophy
- Discuss the application of SCADA, DCS, MVC, MIS
- Describe Safety Instrumented Systems
- Illustrate when and why Safety Instrumented systems are used with reference to some key aspects of IEC 61511/ISA S84
- Define Safe Integrated Levels (SIL) and its assessment
- Discuss the effects of Test Frequency on Risk Reduction and Safe Integrated Levels

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Sources of Ignition and Hazardous Area Classification [PRS-SIH-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course covers two main sections, Sources of Ignition and Hazardous Area Classification. The Sources of Ignition section looks at electrical and non-electrical sources along with their controls. Non-power ignition is also included as an independent section regarding the sources of ignition. The Hazardous Area Classification section illustrates the fundamental purposes of HAC and the standards that are available.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Identify the ignition characteristics of fuel
- Explain the probability of leak ignition by release rate category
- Identify common non-electric sources of ignition
- Indicate the primary controls for non-electric sources of ignition
- Describe how electrical equipment can become a source of ignition
- Describe Hazardous Area Classification and design alternatives
- Identify the purpose of Hazardous Area Classification
- Compare IEC and US standards of Gas groups
- Describe the correlation between area classification and risk assessment
- Identify and describe non-power electrical ignition sources
- Identify non-power ignition controls

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Spacing and Layout, Fire Protection Fundamentals [PRS-SLF-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	5 hrs

This eLearning course extends the learning from the Historical Incident Databases, Plant Layout, and Equipment Spacing and Fire Protection Systems eLearning courses to the Fundamental level. Specific exercises will reinforce learning of the principles and will apply them to the example facility. There will be two interactive sessions in which those applications will be reviewed. Additional material will discuss some of the more complex fire and explosion control situations which may exist in downstream facilities.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Explain the logic of facility and process area layout
- Explain the reasons for selection of a fire prevention philosophy
- Explain how the selected fire control facility can be implemented
  Illustrate those learnings using the example facility

Suggested prerequisites

- Historical Incident Databases, Plant Layout, and Equipment Spacing [PRS-HID-1]
- Fire Protection Systems [PRS-FPS-1]

This eLearning course is included in the Process Safety Engineering Fundamentals eLearning series.

Specific Plant Systems and Equipment [PRS-SPS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course covers several sections, including piping systems, storage facilities, pumps and compressors, heat exchangers, and pressure vessels.

Designed for

Facilities/process engineers, as well as engineers and operations staff involved in process safety and asset integrity.

You will learn how to

- Define the piping system and identify the components associated with it
- Explain why piping systems have a high incident rate and identify its failure modes
- Identify different types of flanges and their main types of failures
- Analyze an incident to determine its failure modes and how they could have been eliminated
- Discuss the main issues that arise from storage tanks
- Classify the different types of storage facilities
- Explain the vapor recovery system from roof tanks and issues that can arise with floating roof tanks
- Classify the different types of atmospheric storage tanks and the potential types of fires that can arise from each type
- Identify the types of pressurized storage and the main issues associated with it
- Illustrate how loading trucks and rail cars are used to prevent loss of containment
- Identify the causes of pump release
- Classify and analyze the two main types of pumps and their issues
- Discuss mechanical single seals and tandem seals and explain their functions
- Identify the three main types of compressors and issues that can arise
- Identify the main types of fired heaters
- Discuss the issues that can occur with direct fired heaters
- Explain how furnace tube failure can occur
- Compare firetube and furnace fired heaters in regard to ignition and explosion
- Identify the main types of heat exchangers and issues that can arise
- Identify types of equipment within pressure vessels
- List and explain the causes of pressure vessel release

This eLearning course is included in the Process Safety Engineering Principles eLearning series.

Transportation of Crude Oil Fundamentals [PRS-TCO-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2.5 hrs

This eLearning course reviews transportation of crude oil utilizing hydraulic grade line (HGL), and the key issues associated with the pumping systems. Also, the operating principles of centrifugal pumps including NPSH requirements and how to determine the temperature profile along a pipeline will be described. This eLearning course covers the following topics:

- Overview of crude oil transportation options
- Centrifugal pumps
- Pipeline pump stations
- Pipeline pumps

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Identify the most common oil transportation methods
- Describe the typical tanker size classes used for crude oil transport
- Discuss the applications and pros/cons of rail transport of crude oil
- Explain Bernoulli's equation, including how to estimate and apply the friction factor
- Perform pipeline/piping friction loss calculations
- Construct the Hydraulic Grade Line for an oil pipeline application, including location of the pump stations, pump type selection, and pumping power estimation
- Explain economic pipe diameter and describe typical velocity and pressure drop guidelines for sizing piping systems
- Describe the basic layout of a pipeline pump station
- Describe the operating principles of centrifugal pumps, including NPSH requirements
- Outline the commonly used plant and pipeline piping grades
- List codes and standards applicable to oil pipeline and plant piping applications
- Perform wall thickness calculations for pipeline and plant piping applications

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Water Injection Systems Fundamentals [PRS-WIS-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3.4 hrs

This eLearning course reviews the water injection facilities commonly used as a function of the application and the purpose and operation of the various components, and the key issues associated with water injection systems. Also, the main compressor types and applications and compressor power calculation will be described. This eLearning course covers the following topics:

- Overview of water injection systems
- Basic principles of sea water injection
- Water deaeration and sulfate removal
- Water injection pumps

Designed for

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

You will learn how to

- Describe injection water quality specifications
- Define the common methods for oilfield water disposal/injection
- Identify the key characteristics that define water quality for injection or disposal
- Explain how to use Silt Density Index (SDI), NACE TMO-173 filtration tests, TOG measurements, and/or TSS measurements to define water quality
- Discuss the seawater injection system equipment's purpose and capabilities
- Discuss the purposes and capabilities for the seawater injection system's front-end technologies
- Identify the basic configuration of the media bed filter's internals and the operating parameters for multi-media and nutshell media filters
- Describe the basic operating principles and limitations for multi-media bed filters and nutshell bed filters
- Describe how vacuum extraction towers and gas stripping towers remove dissolved oxygen from injection water
- Describe the potential for the development of alternate technologies to simplify and reduce costs for dissolved oxygen removal from injection water
- Describe the process for removing sulfate from injection water to reduce the potential for scale formation and reduce the possibility for SRBs to convert sulfate in the injection water to corrosive sulfides

This eLearning course is included in the Oil Production and Processing Facilities Principles for Engineers eLearning series.

Corrosion Control and Protection
[MEC-CCC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course covers the main causes of corrosion in upstream oil and gas operations, as well as monitoring and mitigation methods. The various corrosion mechanisms give rise to a number of different forms of corrosion damage, which will be reviewed. Participants will be introduced to the design principles of simple cathodic protection systems and the basics of utilizing corrosion inhibitors.

Designed for

Managers, engineers, chemists, and operators who need to understand corrosion and its control management in oil and gas production and processing.

You will learn how to

- Define corrosion
- List the different forms of corrosion
- Describe the likely effects of corrosion on safety, environment, and business issues
- Describe the basic aspects of electrochemical corrosion
- Describe the four necessary elements to form an electrochemical corrosion cell
- Identify the different forms of corrosion encountered in oil and gas facilities
- Define the basic corrosion principles which apply to cathodic protection
- Describe the galvanic series of metals and its significance
- Identify methods of corrosion control
- Recognize the use of coatings, corrosion inhibitors, biocides and cleaning pigs and scrapers as forms of corrosion protection

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Fired Heaters and Boilers
[MEC-FHB-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course describes the types of fired heaters used in oil and gas processing, their common applications and service conditions along with the organizations that provide codes and standards for fired heaters. In addition, the eLearning course discusses the design and operation of fired heaters, economic selection criteria, typical pressure-temperature ratings, materials of construction and limitations. The eLearning course finishes discussion with types of boilers, applicable service conditions, materials of construction and limitations for boilers and water quality considerations.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Describe the types of fired heaters used in oil and gas processing, most common applications, and service conditions
- Identify organizations that provide codes and standards for fired heaters
- Describe major code requirements that affect design, material selection, inspection, and safe practices
- Describe design and operation of fired heaters, economic selection criteria, typical pressure-temperature ratings, materials of construction, and limitations
- Describe types of burners, applicable service conditions, construction materials, and limitations
- Describe how Nox emissions are monitored and controlled
- Describe the purpose of coatings, linings, and heat insulation
- Identify basic types of boilers, applicable service conditions, materials of construction and limitations for boilers, and water quality considerations
- Describe the corrosion processes and protection requirements

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Gas and Steam Turbines
[MEC-GST-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course describes the basic types of gas and steam turbine engines used as prime movers/drivers in oil and gas applications and explains their key components, sizing, standards and specifications, and control systems.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Describe how a gas turbine works
- Identify the types of gas turbines, major components, and common applications
- Describe the main factors that affect gas turbine performance
- List the options for heat recovery from gas turbines
- Explain the differences in the design and application of heat recovery from gas turbines
- Describe inlet air filtration systems and air-cooling options
- List common fuel gas specifications for natural gas
- List common pollutants in exhaust emissions and describe their mitigation methods
- Describe gas turbine control systems
- List common steam turbine applications as prime movers in oil and gas facilities
- Describe the types of steam turbines used, key mechanical components, and auxiliary systems
- List applicable company standards and industry codes for steam turbine driven equipment
- Describe types of rotors used and differences in their performance
- Describe the relationship between power output, steam inlet, and exhaust conditions and how this impacts facility design and operation
- Describe common steam turbine control strategies
- List typical steam turbine damage mechanisms and maintenance and repair techniques
- Outline the key steps in supplier selection and materials sourcing
- Describe procedures for over-speed testing

This eLearning course is included in the Basics of Rotating Mechanical Equipment eLearning series.

Machinery Design, Materials and Subsystems [MEC-MDM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course describes the principal materials used for the components for major types of rotating equipment. It also explains how each of the following are used with major types of rotating equipment along with applicable standards and codes: gears, transmission systems, couplings, seals, lubrication, and filtration systems.

Designed for

Facilities Engineers, Process Engineers, Senior Operations Personnel, Field Supervisors, Engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Describe the principal materials used for the components for each major type of rotating equipment
- Outline the criteria that are used in the selection of these materials
- List how materials can affect operations and maintenance
- List applicable codes and standards for materials related to rotating machinery
- Describe the gearing transmission systems used with the major types of rotating equipment
- Describe how couplings transmit power and explain the difference between a rigid and a flexible coupling and under which circumstances each is used
- Outline the functions of gearing and coupling systems and the principal design factors for each system
- Identify the key properties of lubricating oil that are special to gearing systems
- List the failure modes typically encountered in gear and coupling systems and how to identify them before they become failures
- List the key operational and maintenance considerations of gearing and coupling systems
- Describe the key material and manufacturing considerations
- List seal types, categories and the advantages and disadvantages of each
- Describe the key mechanical and operational differences between mechanical contact seals and dry gas seals
- List the codes and standards used for seals in the energy industry
- List the various types of bearings, describe the principles of lubrication for the different bearing types, and list under what conditions they would be used

This eLearning course is included in the Basics of Rotating Mechanical Equipment eLearning series.

Mechanical Equipment [MEC-MEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course describes the principles and application of thermodynamic work and energy, primarily the principles of dynamic response, the structural and foundation concepts and its impact on equipment performance, and the cause and effect of different types of vibrations.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Define the terms “system” and “surroundings” and explain the difference between open and closed systems
- State the first law of thermodynamics, and how it is applied to facilities
- Describe the second law of thermodynamics and explain how it applies to facilities
- Write the energy balance equations for a heat exchanger, valve, separator, and compressor
- List the various types of foundations
- List the determining factors during foundation selection
- Describe the importance of equipment leveling
- Define offset alignment, rotational alignment, and soft foot
- Discuss the process of grouting and potential issues
- List alignment guidelines
- List piping installation and support considerations
- Describe the concepts of equipment condition monitoring, and performance analysis of rotating equipment
- List the parameters typically monitored for pumps and compressors
- Identify the causes and effects of machinery vibrations in pumps and compressors
- Define the techniques typically used to mitigate vibration
- Define the basic principles of centrifugal action in kinetic pumps and compressors
- Describe the basic approach to characterizing a pumping/ compression system
- Define the system curve and describe how to develop it
- Determine the operating point of the system and the pump/ compressor
- Describe how to use pump/compressor selection charts for the selection of the proper pump/compressor type

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Mechanical Equipment Inspection, Operation and Maintenance Core [MEC-MEI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course describes the key considerations, specifications, and codes and standards for inspection, operation, and maintenance of non-rotating equipment.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Define the type of equipment that constitute Non-Rotating Equipment (N-RE)
- Outline the common processes of startup and shutdown of Non-Rotating Equipment (N-RE)
- List common problems that occur during startup and shutdown that can affect equipment integrity
- Describe operating N-RE as units and part of a station
- Describe operational processes and their shutdown parameters that control unit and station operation
- Describe the basic activities and functions of SCADA systems for N-RE systems
- List routine maintenance activities for N-RE in oil and gas facilities
- Define concepts of inspection, routine maintenance, preventive maintenance, repairs and planned major overhauls
- List considerations for sparing of N-RE in oil and gas facilities
- Describe the concepts of stand-by units, spare units and spare capacity
- Describe the process of inspection planning for N-RE
- List the inspection techniques used on N-RE
- Describe RBI and identify associated codes and standards
- List the principal safety issues with N-RE
- Define concepts of equipment reliability and availability related to N-RE
- Describe the concept of risk when applied to N-RE

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Piping Systems and Welding
[MEC-PSW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course describes the material and construction methods and piping system codes, including industry requirements and principles related to piping system operation, safety, reliability, and availability outlining applicable codes/standards and statutory requirements. The eLearning course also explains the purpose of welding, codes, types of weld processes, welding metallurgy, filler materials, shield materials, testing practices, and quality control.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Describe the processes for manufacturing industrial pipe for high pressure and hazardous material containment
- Describe industry design, material, and construction methods
- Define piping specifications, economic selection criteria, and project specific requirements
- Identify pressure, temperature, and weight factors, and describe how they are applied to piping systems
- Define pipe sizing criteria and equations, outlining loads/limits
- Describe key code references applicable to piping sizing and selection criteria
- Explain pipe and fitting manufacturing codes, standards, and industry specifications
- Describe the physical properties of the fluid and the pipeline that affect liquid flow
- Define the application and importance of conservation of energy, conservation of mass to determining hydraulic behavior
- Determine flow friction coefficients and calculate proper line size/pressure drop relationship for hazardous liquids pipelines
- Define issues related to piping system layout and integration with other equipment
- Discuss the five types of welding used in pressure vessels and their application
- Explain the differences between Procedure Qualification Record (PQR) and Welding Performance Qualification (WPQ)

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Properties of Materials
[MEC-PMC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

With time, significant improvements have been made to metal compositions to ensure increased safety, operability, and reliability of the finished product in the field. These improvements have been documented in standards such as American Society of Mechanical Engineers (ASME). Knowledge of these standards is crucial to understanding design and fabrication specifications. This eLearning course provides an overview of the standards that impact the design and fabrication of pressure vessels.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Recognize the basic materials used in pressure vessels
- Define what materials are acceptable and which are not for vessels as compared with piping
- Compare the chemical and physical characteristics of plates, forgings, and piping materials
- Name the most common steel making process for fine grain pressure vessel steel
- Describe the difference between “as rolled” and normalized plate grain structure
- Discuss the iron carbon phase diagram
- Discuss the characteristics of Austenitic Stainless and Martensitic Stainless Steels
- Identify uses of Austenitic Stainless in low temperature applications
- Discuss uses of Martensitic Stainless
- Describe an overview of Duplex Stainless materials
- Discuss Low Alloy Chrome Moly materials for high temperature applications
- Define the types of cladding
- Discuss the advantages of each type
- Review the steps necessary to produce a clad plate in each process

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Reciprocating Engines for Process Facilities
[MEC-REC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course describes the basic types of reciprocating engines, including key operational aspects, characteristics, performance, design, fuel and aspiration systems, codes and standards, testing, and sizing for engines used as prime movers/drivers in oil and gas applications.

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors; engineers who select, design, install, evaluate or operate gas processing plants and related facilities.

You will learn how to

- Describe the basic types of reciprocating engines
- List key performance criteria
- Outline the sizing process for reciprocating engines
- Describe the contents of project mechanical specifications typical for reciprocating engines
- Describe the types of fuels and the type of aspiration systems used in reciprocating engines
- List applicable company/industry codes and standards for reciprocating engines
- Describe systems for starting, lubricating oil, and cooling water
- Describe the inspection and testing of reciprocating engine emissions and performance
- Describe maintenance and repair techniques

This eLearning course is included in the Basics of Rotating Mechanical Equipment eLearning series.

Storage Tanks
[MEC-STC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course describes storage tanks used to store liquid or liquefied commodities. Key concepts for storage tanks explained in the eLearning course include:

- Types and their limitations
- Factors influencing basic engineering design, material selection, fabrication, inspection and testing, operation, and safe practices
- Environmental and safety considerations
- Industry codes and standards

Designed for

Facilities engineers, process engineers, senior operations personnel, field supervisors, engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

You will learn how to

- Describe a high-level classification of types of storage tanks used to store liquid or liquefied commodities
- Describe the types of storage facilities and the products that can be stored in each
- Identify industry codes and standards that cover different tank types
- Identify terminals as intermodal and logistics nodes
- Describe the classification of types of storage tanks
- Describe the factors that distinguish storage tanks
- Describe the selection process of storage tanks
- Identify economic factors used to size and select storage tanks
- Describe the factors that influence the design, construction, operation, and maintenance of above ground (AST) and underground storage tanks (UST)
- Explain environmental and safety considerations and containment requirements for ASTs and USTs
- Describe process facilities and how they affect storage tanks
- Identify typical products or product contaminants that can cause loss of structural or operational integrity of storage tanks
- Identify organizations that develop and provide codes and standards for the design and construction of storage tanks
- Describe the code requirements that affect the basic engineering design, material selection, fabrication, inspection and testing, operation, and safe practices of storage tanks
- Identify codes that govern field-welded, shop-welded bolted atmospheric, and low-pressure storage tank

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Unfired Pressure Vessels
[MEC-UPV-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course explains the industry pressure vessel design and specifications, including the organizations that provide the applicable codes and standards.

Designed for

Facilities Engineers, Process Engineers, Senior Operations Personnel, Field Supervisors, Engineers who select, design, install, evaluate or operate gas processing plants and related facilities

You will learn how to

- Identify the purpose of the code
- Identify the sections of the Boilers and Pressure Vessels (B&PV) Code
- Learn the major components of Section VIII, Div. 1
- Differentiate between an ASME Section VIII, Div. 1 vessel and B31.3 piping
- List the bodies and regulations that govern pressure vessel design and operations
- Describe all design criteria items for pressure vessels
- Differentiate between design pressure, maximum allowable working pressure, and maximum allowable pressure
- Discuss design stress levels according to temperatures
- Differentiate between operating and design temperatures and pressures
- Calculate wall thicknesses of shells, heads, and cones using the formulas from ASME Section VIII, Div. 1
- List corrosion allowances for process nozzles and minimum nozzle neck thicknesses
- State the differences in types of heat treatment
- Compare the results of each type of heat treatment
- Discuss requirements for Post Weld Heat Treatment, methods, and cooling procedures
- Explain the basics of corrosion including rust
- Determine corrosion allowance (CA) for general hydrocarbon use and natural gas service
- Identify the corrosive elements in hydrocarbon processing
- Discuss the ramifications of vessel penetrations
- Identify the options available to remedy nozzle penetrations
- Discuss the rules for inspection openings and manways
- Identify the Records Retention requirements
- Examine vessel appurtenances: vessel internals, externals, and supports; openings (other than process nozzles), externals, vessel supports

This eLearning course is included in the Basics of Static Mechanical Equipment eLearning series.

Control Systems for Oil and Gas Applications (Part 1) [INC-CS1-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course provides an introduction and overview of control systems typically encountered in oil and gas facilities.

Designed for

Process, chemical, and mechanical engineers, (i.e., non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems.

You will learn how to

- Describe the relationship between current, voltage, and resistance
- Differentiate between self-powered and loop-powered devices
- Explain the nature of backup AC and DC power
- Describe what control is, types of control, and its purpose and architecture
- Identify the nature of analog and digital input and output signals
- Describe signals, the use of pneumatic actuators and control systems, and managing noise
- Identify various signal converters and types of wiring and cabling
- Describe instrument tag numbers, PID symbols, and documentation

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Control Systems for Oil and Gas Applications (Part 2) [INC-CS2-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course provides an overview of safety instrumented systems and their applications in oil and gas facilities. The focus is on understanding terminology, concepts, and common pitfalls to improve communication with electrical and I&C professionals.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Explain Safety Instrumented System (SIS) and their uses
- Recognize the importance of identifying risks and hazards, and conducting assessments and analysis to address them
- Differentiate between BPCS and SIS
- Recognize the importance of SIL 1 to SIL 4 classifications
- Describe the SIS life cycle
- Identify the need for product and application diagnostics
- Define management of change (MoC)
- Identify the need for a safety requirement specification
- Identify the purpose of an uninterruptible power supply (UPS)

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Control Valves for Oil and Gas Applications [INC-CVO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

This eLearning course provides an overview of the control valves and actuation devices commonly used in oil and gas operations. The focus is on understanding terminology, concepts, typical equipment configurations, and common pitfalls to make proper selection that is fit for application.

Designed for

Process, chemical, and mechanical engineers, (i.e., non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems.

You will learn how to

- Provide an overview of valve construction
- Briefly discuss the various methods of valve actuation
- Discuss the relevance of the vena contracta
- Compare the difference between flashing and cavitation
- Describe the various types of control valves
- Describe the various types of actuation devices
- Provide a basic overview of pressure regulators and their applications

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Instrumentation Selection for Oil and Gas Applications (Analysis) [INC-ISA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course focuses on an analysis of the composition of the oil and gas product. Analysis of process streams is common in many industries and can be performed using numerous methods, some of which are covered.

Designed for

Process, chemical, and mechanical engineers, (i.e., non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems.

You will learn how to

- Describe the basic elements of an analysis system
- Review the need for basic sediment and water (BS&W) measurement
- Explain the need to measure pH in the oil and gas industry
- Describe the basis of Thin Layer Chromatography (TLC)
- Describe the basis of colorimetry
- Describe the working principle of UV fluorescence
- Select an instrument suitable to measure H2S in a gas stream
- Describe the technologies available for oxygen measurement

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Instrumentation Selection for Oil and Gas Applications (Flow) [INC-ISF-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	6 hrs

In this eLearning course, we discuss various types of flow meters, including their technology, components, features, use, and technology in the oil and gas industry.

Designed for

Process, chemical, and mechanical engineers, (i.e., non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems.

You will learn how to

- Review the basics of flow profiles
- Discuss the different technologies used for flow switches
- Identify the working principle, and advantages and disadvantages of the following positive displacement meters
- Identify the working principle, advantages, and disadvantages of the following head loss meter technologies
- Describe the basic working principle of a turbine meter
- Explain Faraday's law and how this may be applied to the measuring liquid flow
- Describe the working principle of Doppler-based meters
- Review the working principle of transit-time meters
- Explain the working principles of clamp-on meters
- Review some of the tube arrangements used in Coriolis measurement
- Describe the phenomenon of vortex shedding and the formation of vortices
- Explain how the Strouhal factor varies with the bluff body shape and Reynolds number
- Describe the working principle of a typical vortex meter
- Discuss the role of a three-phase separator
- Identify the need for multiphase flow metering (MPFM)
- Explain the differences between calibration, verification, proving, and validation
- Discuss some of the on-site open and closed tank prover systems
- Explain the working principle of a bidirectional pipe prover
- Describe the working principle of eight unidirectional pipe prover
- Review the use and working principle of piston provers
- Describe the role of a LACT system
- Discuss the role of environmental influences
- Identify some common selection criteria

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Instrumentation Selection for Oil and Gas Applications (General) [INC-ISO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course introduces the learner to the field of instrumentation and control in the oil and gas industry. Other topics included are fluid properties, material selection, material compatibility end, operation of switches, relays, and solenoids, basic principles underlying the 4-20 mA instrument signal control loop, instrumentation documentation, and instrument connections.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Identify fluid properties as they relate to instruments selection in the oil and gas industry
- Describe the material selection criteria in instrument selection
- Gain guidance on some of the material compatibility requirements within the industry
- Discuss the operation of switches, relays and solenoids
- Describe the basic principles underlying the 4-20 mA instrument signal control loop
- Describe typical instrumentation documentation
- Describe the three main types of instrument connections

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Instrumentation Selection for Oil and Gas Applications (Level) [INC-ISL-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course explains the reason for measuring level and the various technologies available to measure level.

Designed for

Process, chemical, and mechanical engineers, (i.e., non-instrumentation and non-electrical disciplines), as well as other technical and non-technical professionals with little or no background in IC&E systems.

You will learn how to

- Review basic reasons for measuring level
- Discuss the pros and cons of using a bridle
- Explain the basic functions of a stilling well
- Describe how a simple sight glass is used to monitor the level
- Review how float systems can provide direct reading outputs
- Examine the use of hydrostatic pressure measurement in an open tank level measurement
- Describe the use of electronic remote diaphragm seals
- Discuss the working principle of ultrasonic gap point level meter
- Examine the working principles of conventional pulse radar
- Describe a simple laser-based level measuring system
- Examine the working principle of a Geiger Muller tube
- Explain the principle of tank strapping

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Instrumentation Selection for Oil and Gas Applications (Pressure, Temperature) – [INC-ISP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

This eLearning course focuses on temperature and pressure devices that are critical in detecting and preventing abnormal conditions, which may result in a loss of containment and/or safety events.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Review the fundamental principles of temperature measurement
- Describe the correct application and installation of RTDs, thermocouples, and thermistors
- Describe the requirements for specifying thermowells
- Review the basics of radiation thermometry
- Describe the working principles of the main types of mechanical pressure measurement and their applications
- Describe the features of multi-variable pressure transmitters

This eLearning course is included in the Industrial Automation for Oil and Gas Applications eLearning series.

Division-based Equipment Selection and Installation in Oil and Gas Facilities [ELE-DIV-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is part of a three-part series that introduces the principles and concepts used for the installation of electrical equipment in hazardous (explosive) atmospheres.
Hazardous Area Classification in Oil and Gas Facilities discusses the process of Hazardous Area Classification, where we determine the risk of ignitable atmospheres being present. This eLearning course is relevant to both North American Standards (NFPA, NEC, CEC) and International Standards (IEC).

Division-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Division method used primarily in North America.

Zone-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Zone method used internationally (including North America).

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls, and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe how electrical engineers and designers use electrical area classification drawings to specify electrical equipment and installation practices in hazardous locations
- List the four aspects of hazardous location installations
- List the standards related to electrical installations in hazardous locations
- Define the common terms used in area classification including Class, Division, Group, and T-Code
- Describe the impact of Division, Group, and T-Code designations on equipment specification
- Describe the role of NRTLs as they apply to hazardous area rated equipment
- Explain the principles, pros, and cons of various protection methods commonly used in hazardous area rated electrical equipment
- Describe the basic installation requirements for equipment in hazardous locations
- Compare Division and Zone rated equipment

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Electric Motors and Motor Control in Oil and Gas [ELE-MOT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course explains electric motor drivers including electric power generation fundamentals, basic AC motor types used in oil and gas, selection criteria, efficiency and performance standards, mechanical and electrical design aspects, typical accessories, motor starting techniques, and typical maintenance, inspection, and commissioning activities.

Designed for

Facilities personnel who interface with facility electrical power systems, including project engineers, operation leads, instrumentation, controls personnel, and electrical engineers who are new to electrical power systems within oil and gas facilities.

You will learn how to

- Describe a motor driver and its key operational aspects
- Describe differences in operation between induction and synchronous motors and how to select between the
- Identify key design and operating parameters of electric motors
- Identify electric motor de-rating factors
- Describe the relationship between motor torque and speed
- List available motor accessories and their functions
- Describe the typical data shown on the motor nameplate
- Describe the methods of motor starting and their pros/cons
- Describe the operation of variable speed drives and their effects on electrical equipment
- Describe items generally covered in optional Factory Acceptance Testing
- Describe common steps in commissioning motors
- List typical motor maintenance activities and typical failure modes

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Electrical Safety in Design for Oil and Gas Facilities [ELE-SAF-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course focuses on the design elements of industrial facility power systems common in the energy industry that relate to Electrical Safety. By understanding the effects, causes and factors associated with Shock and Arc Flash hazards, engineers have the opportunity to design and configure power distribution systems to be inherently as safe as possible. Good design achieves a high degree of safety performance while also achieving high reliability, as well as the ability to perform maintenance and additions while equipment is de-energized but maintaining continuity of service to the facility.

Designed for

Facilities personnel who interface with facility electrical power systems, including project engineers, operation leads, instrumentation, controls personnel, and electrical engineers who are new to electrical power systems within oil and gas facilities.

You will learn how to

- Describe how design, installation, operation, and maintenance work together to achieve safety results
- Identify electrical hazards in the workplace and how to avoid them
- Describe the Hierarchy of Risk Control
- Explain the role of design and engineering in electrical safety
- Describe the causes and effects of shock on the human body
- List techniques used to protect people from electric shock
- Explain the causes and effects of Arc Flash/Blast and the factors that impact Arc Flash Incident Energy
- List methods that operations and engineering can use to reduce arc flash risk
- Describe the potential trade-offs between achieving electrical safety and reliability and methods to achieve both
- Explain the importance of working on electrical equipment in a "De-energized" or "Dead" state
- List the limited situations that could justify "Energized Work"
- Describe the design elements that impact electrical safety with the goal of an inherently safe operation
- Describe the operational considerations for electrical work, including 1) Temporary power equipment, 2) Risks of working around overhead power lines, 3) Preventative and predictive maintenance strategies
- Safety impact of unlabeled or mislabeled equipment

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Hazardous Area Classification in Oil and Gas Facilities [ELE-HAZ-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is part of a three-part series that introduces the principles and concepts used for the installation of electrical equipment in hazardous (explosive) atmospheres.

Hazardous Area Classification in Oil and Gas Facilities discusses the process of Hazardous Area Classification, where we determine the risk of ignitable atmospheres being present. This eLearning course is relevant to both North American Standards (NFPA, NEC, CEC) and International Standards (IEC).

Division-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Division method used primarily in North America.

Zone-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Zone method used internationally (including North America).

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls, and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe the conditions required for an explosion
- Explain the risk that electrical equipment represents in the presence of ignitable atmospheres
- Describe the four elements of safely installing electrical equipment in hazardous areas
- Describe the risk factors we encounter in hazardous locations and protective layers applied
- List the industry standards related to area classification
- Describe the various hazardous substances commonly encountered and their key properties related to hazardous location installations
- Describe the roles and responsibilities for various disciplines related to hazardous area classification, installation, and operations
- Define the terms used in hazard area classifications
- List the considerations that lead to determining area classification
- Describe how area classifications are documented, and how to interpret these documents

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

NEC-Based Electrical Design, Installation and Safety Codes [ELE-EDI-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	7 hrs

This eLearning course is designed to give learners a jump-start in navigating and applying the National Electrical Code, NFPA 70 for oil and gas installations. Various sections of the code are discussed as they relate to oil and gas facilities. Though not required, learners will get a richer experience if they can obtain a copy of the National Electrical Code, NFPA 70 to review in conjunction with this eLearning course.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of electrical systems within oil and gas facilities.

You will learn how to

- Describe the need for codes and regulations in the oil and gas industry
- Describe the role of OSHA and enforcement mechanisms for common industry-recognized codes and standards
- Identify codes and standards used for sizing, specification, and installation of electrical equipment and infrastructure for oil and gas facilities Identify codes and standards used for determining the degree and extent of hazardous (explosive) areas in oil and gas facilities
- Describe the purpose and scope of the NEC
- Describe the role of circuit breakers, fuses, and overload relays and the code sections that reference their sizing
- Describe the scope, purpose, and history of NPFA 70B

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Principles of Power Systems in Oil and Gas Applications (Part 1) [ELE-PR1-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course is the first of two eLearning courses intended for those with little or no background in electrical theory or the practical application of those principles to power systems in typical oil and gas or industrial facilities. We strongly encourage taking both eLearning courses. This eLearning course covers the basics of electricity and generating electricity.

The eLearning course avoids the typical academic approach and instead focuses on explaining complex concepts using easy-to-understand analogies. These analogies are then immediately extended to describe how the concepts are used in the design of industrial power systems. Once the basic equipment principles are described, examples are given of how they are applied to affect the safety, reliability, efficiency and cost of power systems.

By the end of these two eLearning courses, the learner should be able to interpret the basic elements of simple one-line diagrams, identify the equipment voltage, power, and current ratings, relate them to the physical equipment installed and understand facility power consumption and energy cost factors.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe electricity and its role in energy
- Explain the general structure of a power system
- Describe the roles and materials used for conductors, insulators and semiconductors
- Describe how magnetic fields and electric fields are related
- Define the common electrical properties of Voltage, Current, Resistance, and Power
- Describe how these properties impact electrical equipment design such as conductors, transformers, motors, and generators
- Describe a basic AC and DC electrical circuit and its components
- Use Ohm's Watt's and Kirchhoff's Laws to solve basic electrical problems
- Describe how basic series and parallel circuits behave and how they are wired
- Describe how static electricity is generated and the hazards associated

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Principles of Power Systems in Oil and Gas Applications (Part 2) [ELE-PR2-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course is the second of two eLearning courses intended for those with little or no background in electrical theory or the practical application of those principles to power systems in typical oil and gas or industrial facilities. We strongly encourage taking Principles of Power Systems in Oil and Gas Applications (Part 1) first.

The eLearning course avoids the typical academic approach and instead focuses on explaining complex concepts using easy-to-understand analogies. These analogies are then immediately extended to describe how the concepts are used in the design of industrial power systems. Once the basic equipment principles are described, examples are given of how they are applied to affect the safety, reliability, efficiency, and cost of power systems.

By the end of these two eLearning courses, the learner should be able to interpret the basic elements of simple one-line diagrams, identify the equipment voltage, power, and current ratings, relate them to the physical equipment installed and understand facility power consumption and energy cost factors.

This eLearning course covers the following topics:

- Three-Phase Power Systems and Harmonics
- Conductor Design
- Overview of Industrial Power Distribution Systems
- Grounding (Earthing) and Bonding

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe 3-phase power systems, their characteristics, applications, and advantages
- List the basic equations used for DC, AC single phase, and 3-phase power systems
- Describe harmonics, their sources, and their impact on power systems
- Explain the basics of conductor construction, selection, and sizing
- Summarize the relationship between conductor current carrying capacity, cross-sectional area, insulation design, ambient conditions, and installation methods

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Zone-based Equipment Selection and Installation in Oil and Gas Facilities [ELE-ZON-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is part of a three-part series that introduces the principles and concepts used for the installation of electrical equipment in hazardous (explosive) atmospheres.

Hazardous Area Classification in Oil and Gas Facilities discusses the process of Hazardous Area Classification, where we determine the risk of ignitable atmospheres being present. This eLearning course is relevant to both North American Standards (NFPA, NEC, CEC) and International Standards (IEC).

Division-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Division method used primarily in North America.

Zone-based Equipment Selection and Installation in Oil and Gas Facilities covers equipment selection and installation practices for the Zone method used internationally (including North America).

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls, and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe how Electrical Area Classification Drawings are used by Electrical Engineers and Designers to specify electrical equipment and installation practices in hazardous locations
- List the four aspects of hazardous location installations
- List the standards related to electrical installations in hazardous locations
- Define the common terms used in area classification including Zone, Group, and T-Code
- Describe the impact of Zone, Group, and T-Code designations on equipment specification and installation
- Describe the role of Certified and Notified Bodies as they apply to hazardous area rated equipment
- Explain the principles, pros, and cons of various protection methods commonly used in hazardous area rated electrical equipment
- Describe the basic installation requirements for equipment in hazardous locations
- Compare Division and Zone rated equipment

This eLearning course is included in the Introduction to Electrical Engineering eLearning series.

Compliance and Pollution Events and Environmental Impacts and Assessments (U.S. Focus) [PIP-CPE-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

In this eLearning course, you will learn the US legislation, regulations, and compliance requirements for pipelines. Also discussed are environmental impacts statements and assessment.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Explain the background of US environmental legislation, especially the National Environmental Policy Act, and similar legislation around the world
- Describe some of the history and politics behind the creation of environmental policy
- Compare and contrast US environmental policy and legislation with that of other energy producing nations
- Explain how US environmental legislation is implemented by regulating agencies
- Describe the major aspects of environmental assessments and environmental impact studies
- Describe the impact of environmental protection laws on pipeline design, permitting, construction, and operations
- Describe the process in producing an EIS – Environmental Impact Statement in compliance with NEPA
- Describe from historic cases studies how
  - Accidents and incidents drive development of codes and regulations in the pipeline business
  - Role of media reporting and public perception of incidents may drive responses both short and long term
  - Events affect the general public, the operator, the industry and regulators
  - Being a linear facility often of considerable length and in multiple jurisdictions, renders control of pipeline facilities more difficult
  - Transparent and exposed pipeline activities are subject to public scrutiny

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline Construction (U.S. Focus) [PIP-PIC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

In this eLearning course, you will learn a brief history of pipelines and the Company and Contractors' responsibilities during pipeline construction. Also discussed are key onshore and offshore construction activities.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Describe the Company and Contractor's responsibilities during the construction phase of onshore and offshore pipelines in the U.S.
- Describe the options for contracting the major onshore and offshore pipeline projects and the factors that determine which method is used
- Describe the key activities during onshore and offshore pipeline construction
- Describe the major tasks during each major construction activity
  Define the environmental effects of construction in the short-term and long-term
- Define the differences in welding and inspection between onshore and offshore pipelines
- Describe the need for and basic processes of trenching and burial
- Define the challenges and solutions for shore crossings, including horizontal directional drilling and riser installations

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline Hydraulics and Flow Assurance [PIP-PHF-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course explains hydrocarbon gas and liquids' physical properties and fluid flow characteristics. Topics also covered are friction flow, volumetric flow, multiphase flow, and flow assurance considerations for pipeline systems.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Describe the physical properties and fluid flow characteristics of hydrocarbon gas and liquid
- Apply volumetric flow equations for natural gas & liquid flows
- Define the key parameters for pump station locations based on hydraulic profile & compressor station locations
- Describe the impact of system pressure on volumetric flow rate, diameter, friction losses, and compression power in gas pipelines
- Describe multiphase flow characteristics
- Describe the importance of temperature management, uses of insulation, and the challenges of design, installation and operation of insulation/heat tracing systems
- Describe the fluid characteristics, flow assurance issue, and methods to manage hydrates, wax/paraffinic fluids, multiphase flow, scale

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline O&M, Leak Detection, Repairs, Alterations and Abandonment (U.S. Focus) [PIP-POM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

In this eLearning course, you will learn the key aspects of daily operations and maintenance of pipeline systems. You will recognize the reasons for monitoring pipelines, how to detect leaks, and common systems that are used for leak detection. Also covered in this eLearning course are key actions and components of pipeline emergency response programs and primary methods to debottleneck a pipeline system. You will learn about the code requirements for asset integrity management, primary onshore and offshore pipeline repair methods, and the general principles behind SIMOPS procedures. Lastly, you will learn about the issues that must be addressed when reactivating an idled pipeline and the requirements to abandon a pipeline correctly.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Describe the risks and consequences of pipeline incidents by type of service and location
- Define High Consequence Area [HCA] and list the impacts on pipeline design and operation
- List the primary pipeline defects and the required repair methods for each
- List the specialized materials, supplies, and equipment that may be required for emergency repairs
- Explain the variety of definitions for decommissioning, idling, and abandoning pipeline facilities

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline Pump and Compressor Stations and Terminals (U.S. Focus) [PIP-PCS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, you will learn the important role played by pumps and compressors in transporting hydrocarbons in pipelines. The eLearning course also covers meter stations, launcher and receiver stations, storage facilities, and valve stations.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Describe the equipment and facilities that constitute, along with the pipeline, a pipeline system, including:
  - Pump and compressor stations
  - Storage
  - Metering
  - Launchers and receivers
  - Valve stations
  - Utilities
- List facilities/components that would typically be found in:
  - Field gathering systems, field injection systems, Crude oil systems, Natural gas systems
  - Refined product systems, NGL products systems, distribution systems

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline Routing and Geomatics (U.S. Focus) [PIP-PRG-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, you will learn basic terminology, concepts, and methods associated with defining a specific location on Earth as part of a pipeline route/alignment description. This includes basic requirements for surveying, the use of advanced techniques like global positioning systems (GPS), remote sensing imagery, and techniques for subsea surveying (bathymetry) applicable for offshore pipelines. The eLearning course further covers key considerations for pipeline route selection and exclusion zones, as well as the impact population density may have on the design of a pipeline.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Define monument, benchmark, longitude and latitude
- Define basic requirements of surveying and describe how points on the earth are uniquely defined relative to the rest of the world
- Define how global positioning systems (GPS) and remotely sensed imagery have modernized surveying techniques over the last 20 years
- Describe methods and inherent difficulties for subsea surveying
- Describe the basic surveys required for pipeline design, construction, and operations
- Describe the impact of geographic information systems (GIS) on pipeline surveys, drawings, and maps
- Describe the functionality of Web/internet resources (such as Earth/Map) for the pipeline engineer and operator
- Describe the critical issues in routing a pipeline
- Compile a list of critical route selection criteria, and identify potential “fatal flaw” situations including:
  - Public safety aspects of pipeline construction, operations, and maintenance
  - Environmental considerations of pipeline construction, operations and maintenance
- Describe the role GIS plays incurred pipeline route selection and how Web/internet resources can assist
- Describe advantages/disadvantages of using existing corridors
- Define the why population/occupied building density must be consider in pipeline routing

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Pipeline Strength, Stability and Environmental Considerations (U.S. Focus) [PIP-PSS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

This eLearning course explains the strength, stability, and environmental considerations in building and operating pipelines on land and in the sea. Topics covered include longitudinal stress, pipelay operations, thermal and pressure effects, and hydrodynamic and soil resistance.

Designed for

Engineers or Facilities Engineers involved in design, operation, maintenance or construction of pipelines or pipeline facilities.

You will learn how to

- Describe the similarities and differences between the ASME 31.4, ASME B31.8, and ISO 13623 with respect to calculating and determining acceptance of pressure-related stresses
- Define the contributing factors for longitudinal stress and where these would likely occur based on pressure, bending, axial loads, thermal/pressure expansion
- Describe the stresses occurring during offshore pipelay operations and the differences and similarities between S-Lay, J-Lay, and Reel Lay Define and describe the application of tie-in/installation temperature, ground temperature, pressure end effects, soil/support frictional resistance
- Describe the hydrodynamic and soil resistance model for pipeline stability
- Define the differences between point and body stability, static stability, dynamic stability
- Define the issues for pipe stability and integrity when in a free (unsupported) span in water and in air

This eLearning course is included in the Pipeline Engineering Principles eLearning series.

Principles of Power Systems in Oil and Gas Applications (Part 1) [ELE-PR1-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course is the first of two eLearning courses intended for those with little or no background in electrical theory or the practical application of those principles to power systems in typical oil and gas or industrial facilities. We strongly encourage taking both eLearning courses. This eLearning course covers the basics of electricity and generating electricity.

The eLearning course avoids the typical academic approach and instead focuses on explaining complex concepts using easy-to-understand analogies. These analogies are then immediately extended to describe how the concepts are used in the design of industrial power systems. Once the basic equipment principles are described, examples are given of how they are applied to affect the safety, reliability, efficiency and cost of power systems.

By the end of these two eLearning courses, the learner should be able to interpret the basic elements of simple one-line diagrams, identify the equipment voltage, power, and current ratings, relate them to the physical equipment installed and understand facility power consumption and energy cost factors.

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe electricity and its role in energy
- Explain the general structure of a power system
- Describe the roles and materials used for conductors, insulators and semiconductors
- Describe how magnetic fields and electric fields are related
- Define the common electrical properties of Voltage, Current, Resistance, and Power
- Describe how these properties impact electrical equipment design such as conductors, transformers, motors, and generators
- Describe a basic AC and DC electrical circuit and its components
- Use Ohm's Watt's and Kirchhoff's Laws to solve basic electrical problems
- Describe how basic series and parallel circuits behave and how they are wired
- Describe how static electricity is generated and the hazards associated

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Principles of Power Systems in Oil and Gas Applications (Part 2) [ELE-PR2-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	3 hrs

This eLearning course is the second of two eLearning courses intended for those with little or no background in electrical theory or the practical application of those principles to power systems in typical oil and gas or industrial facilities. We strongly encourage taking Principles of Power Systems in Oil and Gas Applications (Part 1) first.

The eLearning course avoids the typical academic approach and instead focuses on explaining complex concepts using easy-to-understand analogies. These analogies are then immediately extended to describe how the concepts are used in the design of industrial power systems. Once the basic equipment principles are described, examples are given of how they are applied to affect the safety, reliability, efficiency, and cost of power systems.

By the end of these two eLearning courses, the learner should be able to interpret the basic elements of simple one-line diagrams, identify the equipment voltage, power, and current ratings, relate them to the physical equipment installed and understand facility power consumption and energy cost factors.

This eLearning course covers the following topics:

- Three-Phase Power Systems and Harmonics
- Conductor Design
- Overview of Industrial Power Distribution Systems
- Grounding (Earthing) and Bonding

Designed for

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers (0-5 years) with a need to improve basic understanding of instrumentation and control systems within oil and gas facilities.

You will learn how to

- Describe 3-phase power systems, their characteristics, applications, and advantages
- List the basic equations used for DC, AC single phase, and 3-phase power systems
- Describe harmonics, their sources, and their impact on power systems
- Explain the basics of conductor construction, selection, and sizing
- Summarize the relationship between conductor current carrying capacity, cross-sectional area, insulation design, ambient conditions, and installation methods

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refinery Corrosion Overview [REF-COV-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~1 hr

This eLearning course aims to educate on the sources of corrosion coming from the type of crude oil processed in a specific refining installation.

A brief discussion is held to relate the quality of the crude oil processed and the potential corrosion impacts in the process units where the crude oil is processed. Afterwards, downstream process streams are produced, treated, and blended to get the typical final products from the refining industry.

Corrosion in oil refineries is caused by contaminants present in the crude like salts containing chlorides, sulfur, nitrogen, organic (naphthenic) acids, oxygen, water, metals (V, Ni, Na), by-products formed during processing like heat stable salts, and amines used to eliminate CO2 and H2S. Detailed discussions of each one of the types of corrosion produced by each one of these contaminants are held along the eLearning course.

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refinery Separation Processes Corrosion [REF-RFP-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~1 hr

This eLearning course aims to educate on the sources of corrosion, types of corrosion and mechanisms for preventing or mitigate the impact on Crude Distillation and Vacuum Distillation process units.

Detailed discussion on the corrosion mechanisms and the impact on equipment and instruments taking place at Crude and Vacuum Distillation Units are held.

Corrosion preventing actions that can be applied during the design stage and control actions during normal operation, routine and special maintenance activities are discussed along the eLearning course.

Effective corrosion control minimizes its destructive impact, thereby enhancing operating cycles of process units, optimizing maintenance costs, and ensuring safer and more profitable operations of the refining installations.

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refinery Conversion Processes Corrosion [REF-RCP-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~5 hrss

Detailed discussions on the corrosion mechanisms and the impact on equipment and instruments taking place at each one of the refining process units listed above are held.

Corrosion-preventing actions that can be applied during the design stage and control actions during normal operation, routine, and special maintenance activities are discussed for each process unit along the eLearning course.

Effective corrosion control minimizes its destructive impact, thereby enhancing the operating cycles of process units, optimizing maintenance costs, and ensuring safer and more profitable operations of refining installations.

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refinery Treatment Process Corrosion [REF-RTP-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~1 hr

This eLearning course aims to educate on the sources of corrosion, types of corrosion and mechanisms for preventing or mitigate the impact on the following process units: Amine Treatment and Merox Treatment.

Detailed discussions on the corrosion mechanisms and the impact on equipment and instruments taking place at each one of the treatment refining process units listed above are held.

Corrosion preventing actions that can be applied during the design stage and control actions during normal operation, routine and special maintenance activities are discussed for each process unit along the eLearning course.

Effective corrosion control minimizes its destructive impact, thereby enhancing operating cycles of process units, optimizing maintenance costs, and ensuring safer and more profitable operations of the refining installations.

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refinery Storage Corrosion [REF-RSC-1]

STATUS	LEVEL	DURATION

This eLearning course aims to educate on the sources of corrosion, types of corrosion and mechanisms for preventing or mitigate the impact on most of the storage facilities existing in an oil refinery installation.

Detailed discussions on the corrosion mechanisms and the impact on equipment and instruments taking place at the storage facilities are held.

Corrosion preventing actions that can be applied during the design stage and control activities during normal operation, routine and special maintenance activities are discussed for each type of tank and their associated facilities along the eLearning course.

Effective corrosion control minimizes its destructive impact, thereby enhancing operating cycles of process units, optimizing maintenance costs, and ensuring safer and more profitable operations of the refining installations and their storage facilities.

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refining and Petrochemical Operation Supervisory Skills [REF-SUP-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~4 hrs

This eLearning course describes the generic skills that an operational supervisor should possess to develop a successful performance in leading the daily operational work within a refining or petrochemical installation. These skills include the following items: leading and mentoring, safety, planning, procedures preparation and written and oral communication, among others.

Study cases resolution will be included in this eLearning course to reinforce the provided theoretical knowledge.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

- Supervisory Skills: Conflict resolution, communication, diversity management, teamwork, motivation, coaching and mentoring, change management, mechanical integrity
- Safety Skills per OSHA 3918-08 2017: Safe work practices, including work permits, Log Out/Tag Out, response before emergencies (fire, explosion, leaks, etc.), Personal access to process units
- Planning Skills: Operators and supervisory staff training requirements, operational staff number determination and profile, maintenance planning, operational shift planning
- Basic skills to prepare and review operational procedures and instructions
- Basic skills to prepare written and verbal presentations, daily instructions, and reports in general

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refining and Petrochemicals QA/QC Laboratory Management [REF-QAC-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~4 hrs

Refinery laboratories manage the testing of crude oil, gases & fuels, petrochemicals, and a variety of other refining industry feedstocks, byproducts, and final products for the market. Due to the highly flammable nature of petroleum products, refinery labs must be operated with the utmost caution and care.

Through this eLearning course, a general vision of the activities commonly developed in a QA/QC lab is revised, providing orientation on the best practices to execute them in a safe and optimal way.

This eLearning course provides a comprehensive knowledge of the activities and constraints developed in a refining lab, emphasizing the importance of good communication and interaction among the different parties that uses the information herein generated for operational decision making.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

- Objectives of a QA/QC Lab inside a Downstream facility
- Lab Information Management System (LIMS)
- Industry standards used in QA/QC Lab
- Lab Equipment Management (testing, gauging, metering, calibration, among others)
- Most common test methods used in the refining industry.
- Sampling process management
- Outsourcing test management
- Management of Lab Sections:
  - Physical Chemistry
  - Chromatography
  - Analytical Chemistry
- Test Results Reporting
- Complaints Management
- HSE topics in a QA/QC Lab

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refining and Petrochemicals Routine Maintenance, Planning, and Control [REF-RMP-1]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~4 hrs

All mechanical and automated equipment in a refining installation needs periodic maintenance or repairs. Unscheduled repairs can be very disruptive and costly.

In an oil refinery, cost efficiency and safety are maximized by planning, organization, and having the right personnel in place. Routine maintenance programs can be efficiently planned and executed.

In this eLearning course, you will learn about the different types of routine maintenance, the relations between the stakeholders, the communication flows, the critical elements to ensure a successful routine maintenance, the use of CMMS (Computerized Maintenance Management System) and the safety aspects related to the routine maintenance, among other related subjects.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

- Types of maintenance concepts review: reactive, preventive, condition-based, and proactive
- Routine Maintenance Organization Chart and stakeholders' definition
- Communication flow chart among stakeholders
- Critical elements to ensure a successful routine maintenance: design and engineering, critical equipment and spare part philosophy, maintenance function KPIs, inspection plans, among others
- Use of CMMS (Computerized Maintenance Management System) for routine maintenance and control: backlog follow-up, work orders emission and control, historical maintenance data, reports generation, among others
- RCM (Reliability Centered Maintenance) basic elements review: decision, analysis, and action
- Routine maintenance safety aspects
- Routine maintenance optimization

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refining and Petrochemicals Turnaround Planning and Control [REF-RPT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5.5 hrs

In petroleum refining, turnaround (TA) means a scheduled large-scale maintenance activity where an entire process unit, several of them or the overall refinery are taken off stream for an extended period for comprehensive maintenance and equipment or technology renewal. Once the TA is completed, it is expected that the processing unit will operate in a safe way until the next outage. However, the efficiency and throughput can also be improved, and a reduction in routine maintenance costs can be achieved.

TA operation involves months and sometimes years of planning and requires knowledge, skill, and familiarity with the unique systems and operations of the refinery to ensure the duration of TA per the plan and to have a safe and controlled back to operation process (startup and stabilization).

This eLearning course describes the complex relationships between the team planning the TA and the rest of the refinery organization. The detailed planning process of TA and pre-TA activities are also discussed.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

Basic Concepts (TA Definition, Communication issues, Staff requirements and organization chart, Software implementation, Contracting aspects and constraints, Financial approval levels)

Turnaround Planning (Scope definition, Risk analysis, Execution strategy setup, Timeline definition, critical path definition, Spare parts and materials/chemicals acquisition, Safety aspects, Communication flow chart)

Pre-Turnaround Planning (Scope definition, Execution strategy definition, Timeline definition, Spare parts and materials/chemicals acquisition, Safety aspects, Communication flow chart)

Turnaround Execution (Execution plan updating, Communication flow during TA, Follow up to activities accomplished and pending, Lock out/Tag Out execution, Pre-Commissioning and commissioning activities, Contractors' demobilization, HSE aspects)

Turnaround Close out (HSE statistics analysis, Cost analysis, Duration analysis, Lessons Learned, Contractor evaluations/appraisals)

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Refining Oil Movement and Storage Operations [REF-OMS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

A typical refinery has billions of dollars' worth of liquid assets (crude oil, intermediate process streams and final products) in hundreds of storage tanks. The inventory of these assets is monitored in real-time and moved within and across refinery boundaries in hundreds of movements on a daily basis.

The management of these assets is crucial not only from a safety point of view but also for reconciliation of receipts and dispatches to avoid discrepancies and thereby avoid huge losses of revenue or overpaid for less than ordered delivered products.

This eLearning course will provide the basis information for developing the daily operations associated with the storage and handling of the liquid and gaseous material associated to a typical oil refinery.

Basic principles to handling the different stored hydrocarbon and chemical materials are provided. Measurement of the volumes contained in tanks and transferred from one location to another is also discussed. The characteristics of the information systems to manage the refining oil and storage movements together with associated safety are also discussed.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

- Basic principles and controls for having a safe and continuous operation in feedstocks tanks, intermediate tanks, product tanks, marine dock facilities – loading and unloading operations
- Volume and mass measurement principles in tanks and transference operations
- Characteristics of the information systems associated to the refining oil movement and storage: 1) Tanks Information System (TIS), Oil Movement Management System (OMM)
- Oil Logistics, Accounting and Shipping Management System (OAS), Custody transfer operations principles, Storage effluents disposition
- Safety associated to the refining oil movement and storage: 1) Fire, 2) Explosion
- Products spillage

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Reliability Centered Maintenance (RCM) [REF-RCM-1]		
STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~4 hrs

Reliability-Centered Maintenance (RCM) is a complete framework that always attempts to extend equipment lifespans and decrease downtime, in the most cost-efficient way possible.

Essentially, Reliability-Centered Maintenance (RCM) provides a roadmap to analyze and act upon the root causes of equipment failures (technology, culture, design, and maintenance strategy inefficiencies) in pursuit of affordable asset reliability.

This eLearning course contains the basis to successfully implement an RCM program in a Refinery or Petrochemical installation. The steps to implement an RCM program, failure modes review, and consequences of failure assessment are discussed in detail.

Designed for

Process engineers, planning and economics engineers, inspection engineers, HSE engineers, maintenance engineers and supervisors, laboratory managers and supervisors, turnaround planners and operation supervisors.

You will learn

- Basic Concepts: Reliability and Maintenance, Types of Maintenance, SAE JA1011 Standard, RCM advantages and disadvantages, among others
- Steps to run an RCM Program:
  - Select and asset RCM analysis
  - Outline the functions of the system for the selected asset
  - Define the failure modes
  - Assess the consequences of failure:
    - Failure Modes and Effects Analysis (FMEA)
    - Failure, Mode, Effect, and Criticality Analysis (FMECA)
    - Hazard and Operability Studies (HAZOPS)
    - Fault Tree Analysis (FTA)
    - Risk-based Inspection (RBI)
  - Determine a maintenance strategy for each failure mode: condition-based maintenance (CBM), reactive maintenance, preventive maintenance, and predictive maintenance
  - Implement the strategy and perform regular reviews

This eLearning course is included in the Introduction to Refining Operations for Engineers eLearning series.

Acquiring Goods and Services
[PRJ-AGS-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is an introduction to procurement and contracting for the equipment, materials, and services needed for the development of petroleum projects. One subsection addresses procurement by owner organizations, including sourcing, transportation, and materials management. Additionally, participants become familiar with the distinct types of contracts used for project development. The course addresses the contracting process and factors for successful contract placement.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- The five major procurement functional areas and how each area facilitates procurement of quality equipment, materials, and supplies in a timely manner for a project
- The key activities of each of the following procurement topics and describe the activities associated with each one: procurement planning, purchasing, tracking manufacturing, logistics management, site materials handling
- Describe the major activities in the joint service buyer and seller contracting process

This eLearning course is included in the Facilities Project Management eLearning series.

Construction Management
[PRJ-CMC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course is an introduction to construction planning and site management for projects associated with petroleum developments. The eLearning course introduces key aspects of construction planning and contractor selection. Subsections address advanced work packaging, site HSE management, quality control and project closeout.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- How to effectively manage the construction initiation and execution process
- How the structured development of work packages helps maintain good jobsite labor productivity
- How to maintain good jobsite labor productivity through the structured development of work packages
- The benefits of construction quality control tools and techniques

This eLearning course is included in the Facilities Project Management eLearning series.

Cost Estimating for Facility Projects
[PRJ-CEC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course introduces key aspects of cost estimating, including estimate preparation and uncertainty assessment. Participants learn about the types of cost estimates, along with their uses and requirements at each succeeding stage of project development. Coverage includes selected topics in labor productivity, owner's costs, and contingency management.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- For each phase of project development, the name the estimate produced, its use, and the methodology used to create it
- How to guide the development of the definitive cost estimate that needed to secure full funding for a petroleum project
- Describe what estimate assurance is and briefly describe the steps in the assurance process

This eLearning course is included in the Facilities Project Management eLearning series.

Design Engineering Management
[PRJ-DEM-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course describes how completion of key engineering deliverables, careful design control, and the use of value-improving techniques result in facility designs that meet the needs of key business and operations stakeholders.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- How engineering design progresses through each development stage of the project development system
- How to improve the value of a project by selecting Value Improving Practices that focus on key value drivers such as cost, schedule, operability, and maintainability
- Explain why validation and verification of design engineering deliverables is a best practice
- Techniques for controlling the facility engineering design effort

This eLearning course is included in the Facilities Project Management eLearning series.

Interface Management for Programs and Projects
[PRJ-INT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course introduces interface management skills to establish a common framework of boundaries and communications among program or project stakeholders. Interface Management methodology starts with planning and continues with interface collaboration workshops. It includes an interface register, a communication plan, and a checklist of things to do (gather all disciplines based on design statements or feed studies, plan the project on paper, identify interface areas, etc.).

Designed for

Project managers, project engineers, project control representatives, and purchasing personnel who plan, manage, or participate in project teams.

You will learn

- Explain interface management terminology
- List the four major types of interfaces and give examples of each
- Describe the differences in managing internal and external interfaces
- Describe key components of an interface management plan
- Describe critical components of an interface management process
- Develop an interface chart that characterizes the directness of an interface between the owner organization and key contractors for a multi-project program

This eLearning course is included in the Facilities Project Management eLearning series.

Onshore Field Development Programs and Projects
[PRJ-OFD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces onshore petroleum development programs and projects in the upstream, midstream, and downstream segments of the petroleum industry. Development programs can span 5-10 years and are often composed of annual campaigns. These campaigns combine drilling and completion activities, infrastructure projects, and surface facility projects. The material presented is at the basic competency level.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- What each of the petroleum industry development segments are
- The process, characteristics, and challenges associated with petroleum program management
- How project teams use the stage-gate petroleum project development system used in the industry today

This eLearning course is included in the Facilities Project Management eLearning series.

Progress Measurement
[PRJ-PMC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course describes how to establish project progress measurement, track it regularly, and report performance to key stakeholders. It covers the five methods used to assess design engineering and field construction progress and introduces the concept of earned value analysis (EVA).

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- How to describe the different approaches used to measure project progress and give examples of their use
- The concept of earned value analysis, including how it to determine schedule and cost variance
- How to estimate the final cost of a project given the project budget, earned value and actual costs to date

This eLearning course is included in the Facilities Project Management eLearning series.

Project Governance
[PRJ-PGC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces the business and organizational context that frames petroleum project development. Project governance dictates how program and project management decision-making occurs. This course demonstrates how project managers scale a company's program and project governance framework to match the type, size, and complexity of its projects.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- What good governance is
- How governance guides programs and projects, including the seven elements necessary for effective management.
- How you can adjust the stage-gate project development system using project complexity criteria

This eLearning course is included in the Facilities Project Management eLearning series.

Project Resources and Organization
[PRJ-PRO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course discusses how you can select and organize resources in each stage of development. Key issues that affect organization design and personnel selection are examined. We will also explore competency and how to build high-performing teams.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- The key roles and responsibilities of the project sponsor, project manager, decision board, and integrated team members
- Explain what an organization breakdown structure is and describe the advantages & disadvantages of the matrix- and task-force types of project organizations
- Explain the concept of project manager competence and describe the skills needed in the technical, business, and leadership skill areas
- List the characteristics of a high-performing team and describe the key steps in a conflict resolution process

This eLearning course is included in the Facilities Project Management eLearning series.

Project Risk Management
[PRJ-RMC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces techniques and tools needed to identify and manage risks typical of petroleum projects. Topics include the risk management process: identifying, characterizing, and ranking risks and developing mitigation strategies. The course also describes how to use a risk register for assigning accountability and monitoring mitigation progress.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- How volatility, uncertainty, complexity, and ambiguity make managing petroleum projects extremely challenging
- How to use a five-step process to identify and manage petroleum project risks
- When best to use qualitative and quantitative risk assessments

This eLearning course is included in the Facilities Project Management eLearning series.

Scheduling
[PRJ-SCC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course introduces planning and scheduling for petroleum development projects. It describes how to create the distinct levels of critical path schedules needed to meet the project planning, control, and reporting needs of various stakeholders.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- The difference between planning and scheduling
- The process for developing a critical path schedule and the purpose of each step
- How to use only validated and approved information to read and create an informative, high-quality schedule
- Describe what a baseline schedule is, including who prepares it, when to prepare it, and how the PM can use it

This eLearning course is included in the Facilities Project Management eLearning series.

Scope Delivery
[PRJ-SDC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course describes how to validate a scope of work for a project and coordinate the discipline plans necessary to complete the execution stage. The eLearning course addresses the project execution plan (PEP) contents, including the Staffing plan, HSE Plan, Scope of Work, Risk Management Plan, Budget, Schedule, and EPC phase details. The eLearning course includes preparations tips for the PEP.

Designed for

Personnel working on development projects in the petroleum industry's upstream, midstream, downstream, and transportation segments. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- How to create a plan for developing a scope of work for your project
- The process for developing a sound project scope statement using the project charter and the preliminary scope statement
- How to verify a scope of work using a work breakdown structure
- Explain what a project execution plan is and how the team uses it to deliver the scope of work
- How to use the project execution plan to facilitate scope delivery

This eLearning course is included in the Facilities Project Management eLearning series.

Budgeting
[PEB-BUC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course is a guide through the most important activity an oil and gas company undertake. More important than exploring for oil or operating existing assets? Yes, and this eLearning course explains why that is true. When it comes to the big picture of economics, budgeting suddenly takes center stage and displays its power to drive economic success. Budgeting is where economic success is incubated. In this eLearning course, budgeting methodology is explained, and the contribution economic evaluation tools make sure the process is clarified.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Screen projects for inclusion into the capital budget allocation
- Economically rank projects
- Accommodate legal, safety and regulatory impacts to capital budgets
- Think like an executive when evaluating capital budget allocation to projects and corporate functions

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Cash Flow
[PEB-CFC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course forms the skeleton for understanding how a project will be valued. Forecasts for oil and gas volumes, price forecasts, inflation are incorporated to forecast how much money a project will generate. From calculating oil and gas revenue this eLearning course addresses royalties, operating expenses, capital expenses, operating taxes and other expenses.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Construct a revenue model
- Develop a full cash flow model
- Calculate net cash flow
- Distinguish between cash flow for concessions and production sharing contracts
- Produce robust flexible cash flow forecasts

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Decision Analysis Process
[PEB-DAP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

Is there anything more important to success than good decision making? This introductory topic provides an overview of the discipline and problem-solving approach of decision analysis. The most common business application is the capital investment decision. Back-of-the-envelope calculations are sufficient for most everyday decisions, such as whether and how to spend money and time.

Designed for

Personnel working on development projects in the upstream, midstream, downstream, and transportation segments of the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- Decision Analysis Process
  This lesson recommends a 10-step process, ranging from identifying a decision opportunity to the post-decision review. This is much like a typical problem-solving process as in engineering design. The added feature is formal value calculations using stochastic (probabilistic) methods.
- Expected Value Calculation Tools
  Decision trees and Monte Carlo simulation are the principal tools for calculating expected values. Though both methods solve for expected values, they do so in very different ways. Each method has its advantages and disadvantages, and often both methods serve different parts of an analysis.
- Influence Diagrams and Structural Decision Trees
  Developing a structural decision model is a good practice and is often an output of decision framing.

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Decision Policy and Value Calculations Fundamentals
[PEB-DPV-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	6.5 hrs

This eLearning course mostly focuses on maximizing shareholder value, measured as expected monetary value (EMV), which is risk-weighted (expected value) NPV. This eLearning course introduces value of information and Bayes' rule, and covers the following topics: 1) Decision Policy Component, 2) Time Preference 3) Social Factors in Decision Policy, 4) Establishing a Risk Tolerance Coefficient for Risk Policy

Designed for

Personnel working on development projects in the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- To decompose decision policy into objective(s), time preference, and risk preference
- An attribute-scoring approach to multi-criteria decision making (MCDM)
- Using lotteries to elicit trade-offs between time, risk, and conflicting metrics
- Historical development of present value discounting and discount rates used
- The present value (PV) formula that always works
- Why to not risk with the PV discount rate
- Correct attention to detail in the "Present Value Challenge"
- How to apply cashflow or NPV-equivalents for non-monetary criteria, such as CO2 emissions and Lost-Time Incidents
- Issues in trading-off social metrics for money
- About Quality-Adjusted Life Years (QALYs) and value differences across the world
- To view spending (time and money) on HSE as an optimization problem
- How decisions with significant potential for loss are difficult decision without a risk policy
- To select the best alternative as the one with the greatest expected utility or certainty equivalent (both criteria produce the same choices)
- To use the Utility Elicitation Program to practice making risky decisions and settling on a value for the risk tolerance coefficient

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Economic Decision Tools
[PEB-EDT-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course addresses the need for economic evaluation criteria for petroleum projects. How can one project be compared to another when the projects are in different regions or offshore versus onshore or gas versus oil? In the purest sense, economic evaluations are independent of the details of a project and focus on the particular economic inputs such as capital investment needed, operational expenses, royalty rates and, ultimately, the economic outcomes using comparative economic metrics to evaluate projects and make decisions.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Calculate compound interest
- Determine present values for future cash flows
- Evaluate NPV, DROI, IRR
- Choose the right economic metric
- Use economic decision tools to evaluate projects

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Financing and Ownership
[PEB-FOC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course explores financial aspects of how oil and gas companies manage the business of funding projects. Where do oil companies get the capital to explore for oil and gas? Do oil companies borrow money to develop projects? How much interest do they pay? What is the hurdle rate and why is it similar for almost all oil companies regardless of whether it is a large integrated company or an independent upstream company? These are some of the financial issues covered in this eLearning course.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Calculate the average cost of capital for a typical oil company
- Recognize the drivers for a company's hurdle rate
- Determine the opportunity cost of capital

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Judgments and Biases Fundamentals
[PEB-JBC-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This eLearning course introduces judgments and biases. Analysis quality depends mainly on the quality of inputs, and some of the inputs may be highly subjective. We rely upon subject matter experts (SMEs) to judge input probabilities and input distributions. We also ask SMEs to describe relationships (perhaps physical laws) so that we can model correlations. The following topics are also discussed.

Designed for

Personnel working on development projects in the upstream, midstream, downstream, and transportation segments of the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- Causes and characteristics of common motivational and cognitive biases
- To recognize indications of bias
- About the winner's curse bias experienced found in competitive bidding and how to adjust your bids
- About the optimizer's curse bias in developing an asset or project portfolio to temper your expectations
- How to design confidence interval tests for judging P90-P10 ranges
- How to use True/false questions and judging the quality of answers
- To self-appraise your personal calibration
- An approach for eliciting a continuous distribution function in stepped ranges
- To clearly and unambiguously define the event of interest
- What biases the SME might have, and to recognize and test for such biases
- Ways to capture the distribution from the SME's answers
- To ask the SME to describe how the subject parameter relates (correlates) to others in the model

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Monte Carlo Simulation and Distribution Fundamentals
[PEB-DIS-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2.5 hrs

Quality technical and business decisions require competent analyses of costs, benefits, and risks. You will learn a decision analysis process and foundation concepts so you can actively participate in multi-discipline evaluation teams. The focus is on designing and solving decision models.

Probability distributions express professional judgments about risks and uncertainties. These judgments carry through the calculations. Decision trees and influence diagrams provide clear communications and the basis for valuing each alternative. Monte Carlo simulation is a superior calculation alternative for some problems. Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. Familiarity with Microsoft® Excel® is required.

Designed for

Personnel working on development projects in the upstream, midstream, downstream, and transportation segments of the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn

- Name four discrete and four continuous probability distributions with an example of each
- Describe the correlation coefficient formula and provide three correlation examples
- Describe the Monte Carlo method
- Describe how to obtain a conditional probability from field data or Monte Carlo simulation (MCS) recordsets
- Describe at least two statistical MCS stopping rules
- Explain the improved efficiency of MCS using Latin hypercube sampling
- Compare payoff tables, decision trees, and MCS, identifying the strengths and weaknesses of each
- Explain optimization with MCS
- Describe two sensitivity analysis methods when using MCS
- Calculate deterministic variance and stochastic variance from a summary of deterministic and stochastic model results

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Oil and Gas Pricing
[PEB-OGP-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course demystifies oil and gas pricing. Is that possible? The answer is yes, and this eLearning course clarifies the factors contributing to how oil and gas pricing is determined. The tools and methods in common use for managing oil and gas pricing are described and participants will practice developing and applying pricing models. These models will contribute to the basis for an economic analysis and understanding of projects as companies make decisions in the real world.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Calculate crude prices taking into account API gravity and sulfur content
- Apply quality bank methods to forecast relative prices
- Inflate prices over the life of a project
- Apply marker crude methodology to forecast oil prices

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Petroleum Industry Accounting
[PEB-PIA-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course explores the difference between accounting and economics – and there is a world of difference. Oil and gas companies need both accountants and economists to run their businesses and they serve different functions within a company. But even beyond serving different functions they speak different languages and live in different worlds. In this eLearning course, we gain an appreciation for accounting terms, methodology and, most importantly, clarify the differences between accounting and economics.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Interpret the financial accounting section of annual reports
- Calculate depreciation, depletion, and amortization (DD&A)
- Separate cash flow from profit
- Recognize non-cash charges
- Focus on cash flow when selecting economic metrics for project evaluation

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Production Forecasting
[PEB-PFC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course sets the stage for understanding the business of making decisions in the oil and gas business. Key to making economic decisions is understanding how much oil and gas are anticipated to be produced each year of a project. Using multiple methods, this eLearning course demonstrates and develops the understanding of how oil and gas production behaves over time, and how to forecast the levels of production over time.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Forecast annual oil and gas production using exponential and constant percentage decline methods
- Forecast total production over the life of a project
- Calculate the economic limit when analyzing a project
- Use multiple methods to accurately forecast well and field production

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Risk and Uncertainty
[PEB-RUC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course addresses how to handle risk and uncertainty, which are always factors to consider when forecasting production, cash flow or economic outcomes. It provides clear definitions of risk and uncertainty, enabling the audience to identify different types of risk. The eLearning course demonstrates how probabilistic analysis works and how the modeling methods provide means for describing scenarios with a variety of possible outcomes.

Designed for

Managers, engineers, explorationists, field accounting supervisors and other personnel who need to develop or improve their skill and understanding of basic economic analysis and profitability of petroleum exploration and production.

You will learn how to

- Identify different types of risk
- Model risk and uncertainty
- Use mathematical methods to quantify risk
- Handle sunk costs and tax credits when considering risk
- Recognize and use probabilistic uncertainty models
- Recognize uncertainty in economic analysis

This eLearning course is included in the Basic Petroleum Economics eLearning series.

Value of Control Fundamentals [PEB-VCC-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4 hrs

This eLearning course introduces value of control and covers the following topics:

- **Decision Trees – Expanded**. Decision trees are the most recognizable feature of decision analysis. So, many people think these are synonymous.
- **Value of Control I**. Investing to reduce project and operations risk are typical value of control (VOC) problems. Improving "control" means taking action to improve the probability and/or outcomes of a chance event.
- **Value of Control II.** An oil tanker has a heightened risk of collision accidents and oil spills if it loses its steering or propulsion power system. This exercise is to develop a decision model to decide whether to spend additional money on maintaining the tanker's steering and propulsion systems.

Designed for

Personnel working on development projects in the upstream, midstream, downstream, and transportation segments of the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn how to

- When it is okay to put costs and benefits on branches when realizing those values
- Low- to moderate-cost software tools
- Advantages and disadvantages of decision trees compared to Monte Carlo simulation
- The distinction between threats and opportunities in project management terminology
- About the risk matrix (useful to illustrate the VOC concept, though not recommended for decision making)
- Set up and solve a decision tree to evaluate the value of a control-adding alternative
- Apply Monte Carlo to optimize one or multiple control decision variables
- Calculate the expected value (EV) cost of an accident
- Set up a decision tree to evaluate the EV cost of an accident vs amount spent on maintenance
- Calculate the EV cost of an accident with Low Maintenance plus Insurance

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Value of Information and Bayes' Rule Fundamentals [PEB-BRC-2]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4 hrs

This eLearning course introduces value of information and Bayes' rule, and covers the following topics:

- **Probability Types, Venn Diagrams, and Probability Rules**. Venn diagrams and probability trees are good ways to explain the foundation probability rules.
- **Bayes' Rule –** Bayesian analysis is central to information applications. Machine learning and variants are central to popular artificial intelligence methods, such as natural language processing. Typical investment decisions seldom have much data and rely instead on expert judgments. Bayes' rule calculates revised probabilities based on new information.

Designed for

Personnel working on development projects in the upstream, midstream, downstream, and transportation segments of the petroleum industry. This includes project managers, project engineers, facility engineers, production and operations engineers, wellsite supervisors, project control representatives, and supply chain personnel.

You will learn how to

- To draw Venn diagrams showing discrete outcomes of one to several events
- How to explain the addition and multiplication rules with Venn diagram or probability trees
- To extract conditional probabilities from Venn Diagrams and probability trees
- How using intuition to revise probabilities based on new information typically produces horrible results
- To set up a decision tree model with an alternative to acquire additional information before making a significant capital investment decision
- About the value of information (VOI), both perfect/imperfect
- To solve Bayes' rule calculations by formula, inspecting a Venn diagram, or (recommended) joint probability table
- To set up a probability tree for a typical oilfield equipment problem
- How to analyze the value of possibly corrupt information
- How to use Monte Carlo simulation to optimize a safety or quality threshold
- To set up and solve a decision tree to optimize the Platform Size with today's information

This eLearning course is included in the Petroleum Risk and Decision Analysis eLearning series.

Data Foundation for the Digital Oilfield
[DSA-DFD-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	5 hrs

Data is an often-neglected aspect of Petroleum Data Analytics projects. We are excited to get started building a predictive model given the new artificial intelligence/ machine learning techniques but if we rush over the data profiling steps, not understanding the possible inherent bias of our data sets, we can create very sophisticated but not very useful models. Remember the old adage "garbage-on, garbage-out." Effective data visualization techniques can help us tell an important story with the data and highlight new insights into operational systems. But on the other hand poor data visualization methods can allow an unsuspecting analysts to "lie with data."

Designed for

This is not a course for new data scientists but focuses on the rest of the engineers, geoscientists and data analysts who want to understand how this field is evolving.

You will learn

- Current data management practices, silos, clouds and lakes
- The truth about drilling and field sensors
- Data visualization and communications challenges (data storytelling)
- Current data management practices, silos, clouds and lakes
- The truth about drilling and field sensors
- Data visualization and communications challenges (data storytelling)

This eLearning course is included in The Impact of Data Analytics on the New Digital Oilfield eLearning series.

Digital Oilfield Challenges, Barriers to Adoption, and Risks
[DSA-DOC-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

In this eLearning course, we cover the enabling technology and IT infrastructure aspects of the digital oilfield through an understanding of the history of how the digital oilfield evolved (5 stages of digitization), the importance of a good data foundation, challenges in the adoption of digital solutions, and the threat from cybersecurity malware.

Designed for

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

You will learn

- Five stages of digitization of the oilfield
- Challenge to adoption and lessons learned
- Physical and cybersecurity challenges

This eLearning course is included in The Impact of Data Analytics on the New Digital Oilfield eLearning series.

The Future of the Digital Oilfield
[DSA-FDO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	6 hrs

There will be many factors that will influence the future of oil and gas operations, including technology trends, economics, market forces and demand for oil and gas products. What will the future digital oilfield look like? What will be the role of the future petroleum engineer? There are no right or wrong answers to this question and many factors that today are uncertain. But the best way to predict the future is to invent it.

Designed for

This is not a course for new data scientists but focuses on the rest of the engineers, geoscientists and data analysts who want to understand how this field is evolving.

You will learn

- Describe industrial Internet of Things (IoT)
- Explain automation and autonomy as emerging trends in digital technology
- Recognize the importance of using robots and drones in oil and gas operations
- Describe blockchain and digital supply chain
- Describe what are remote decision support centers
- Explain the importance of measuring what matters
- Recognize the future of production facilities – offshore and onshore
- Describe what is a digital twin
- Recognize the role of artificial intelligence (AI) and machine learning in oil and gas operations
- Recognize the role of data science and advanced engineering analytics in oil and gas operations
- Identify the five concerns in industrial artificial intelligence (AI)

This eLearning course is included in the Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications eLearning series.

Introduction to Data-driven Workflows
[DSA-IDW-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course introduces data-driven modeling, including its connection to machine learning. We will examine the rising applications of machine learning in different sectors of the economy and how this impacts daily life. Learners will then see how the principles and effects of machine learning are transforming work in the oilfield, focusing on the various applications of data-driven modeling and where this can make operations more efficient and profitable.

Designed for

This is not a course for new data scientists but focuses on the rest of the engineers, geoscientists and data analysts who want to understand how this field is evolving.

You will learn

- Define and describe machine learning
- Discuss the adoption of machine learning and data-driven modeling in our industry, including potential strengths and obstacles
- Identify the modes of machine learning and what distinguishes each
- Recognize the main forms of supervised learning
- Conceptualize applications of supervised learning
- Describe unsupervised learning and what distinguishes it from supervised learning
- Conceptualize applications of unsupervised learning
- Identify different data types
- Recognize sampling methods and their pitfalls
- Be able to interpret various measures of univariate statistics
  - Measures of central tendency
  - Measures of spread
  - Visual representations of data
  - Handling of outliers

This eLearning course is included in the Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications eLearning series.

Introduction to the Digital Oilfield
[DSA-IDO-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4.5 hrs

We will start by introducing the Digital Oilfield, what it is, how it developed and what the future of digital technology and data analytics in the oilfield might bring. The Digital Oilfield is a reality, but it is taking on new forms shaped by emerging digital technologies, improved data visualization and advanced analytics techniques.

Designed for

This is not a course for new data scientists but focuses on the rest of the engineers, geoscientists and data analysts who want to understand how this field is evolving.

You will learn

- Physics, statistics, and explainable AI
- Digital oilfield 2.0 (what's different this time)
- What's the big deal about big data and data science

This eLearning course is included in The Impact of Data Analytics on the New Digital Oilfield eLearning series.

Operational Technology and Field Networks
[DSA-OTF-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

The digital oilfield has brought together systems in the field with corporate financial systems and headquarters engineering experts to improve the overall performance of the producing asset from reservoir to surface production facilities to the sales or export market. The field systems grew up in a different environment than the corporate IT systems, so the integration of these disciplines is taking some time to perfect, and some interesting challenges present themselves along the way.

Designed for

This is not a course for new data scientists but focuses on the rest of the engineers, geoscientists and data analysts who want to understand how this field is evolving.

You will learn

- The convergence of OT and IT
- Digital field instrumentation and control system networks (SCADA)
- Enterprise system thinking and design

This eLearning course is included in The Impact of Data Analytics on the New Digital Oilfield eLearning series.

Supervised Machine Learning
[DSA-SML-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course introduces supervised learning as a key type of machine learning that drives data-driven analysis across economic sectors and impacts the experiences of consumers. The eLearning course focuses on the emerging uses of supervised learning in the oil and gas industry as an important complement to other forms of analysis, as well as subject matter expertise, in solving diverse problems and providing reliable data streams

Designed for

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

You will learn

- Distinguish between two forms of supervised learning: regression and classification
- Recognize use cases for regression and classification
- Identify why an iterative approach is essential in supervised learning
- Recognize covariance and correlation as key aspects of data pre-processing, and track their importance for supervised learning
- Recognize a generalized workflow for supervised learning
- Identify and explain the steps involved in exploratory data analysis
- Recognize the need for, and some of the nuances involved in, handling outliers
- Identify how to apply both the Standard and Min-Max methods
- Recognize how performance metrics are used to evaluate regression models
- Recognize that there is no universal algorithm that can be effectively used to evaluate machine learning models
- Describe how to determine training and testing sets from a single dataset
- Examine method for overcoming overfitting
- Examine validation techniques, including 3-fold cross-validation and K-fold cross-validation
- Follow and explain an end-to-end workflow for regression
- Identify the purpose of non-parametric regression
- Follow and explain an end-to-end workflow for classification problems
- Follow the workflow for several use cases involving supervised learning in the oilfield

This eLearning course is included in the Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications eLearning series.

Unsupervised Machine Learning
[DSA-UML-1]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course introduces unsupervised learning as a key type of machine learning that streamlines the extraction of information from raw data that can be very high dimensional, noisy, and heterogeneous. The eLearning course begins by placing unsupervised learning among the three forms of machine learning and explaining its distinguishing qualities. Unsupervised data analyses are shown to primarily comprise two goals: either pattern identification or dimensionality reduction. In the case of pattern identification, the objectives can be two-fold. The most common application is to condense large datasets into meaningful clusters that contain data points that share similar characteristics.

A second application is related to anomaly detection. This eLearning course shows that this can be challenging when dealing with multivariate data. In either case, tuning the algorithm to choose the appropriate number of clusters and balancing cluster homogeneity with inter-cluster differences is important. The eLearning course also discusses data pre-processing steps, including exploratory data analysis and scaling. A discussion of one of the approaches to clustering is provided to enable the participant to see unsupervised learning in action. Finally, the eLearning course reviews the uses of supervised learning in the oilfield. A case study approach shows basic and more complex applications, including studies from leading experts in the field.

Designed for

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

You will learn

- Increase awareness of the purposes and benefits of unsupervised learning
- Dig into how unsupervised learning works, including clustering and dimensionality reduction
- Assess the requirements for proper clustering or grouping of data
- Recognize how unsupervised learning and clustering is applied in the oilfield

This eLearning course is included in the Introduction to Machine Learning/Data Analytics for Subsurface Engineering and Geoscience Applications eLearning series.