The Competency Alliance

Net-Zero & Renewables

eLearning Courses

For Technical Professionals

Self-paced online series and eLearning courses

www.petroskills.com/blended

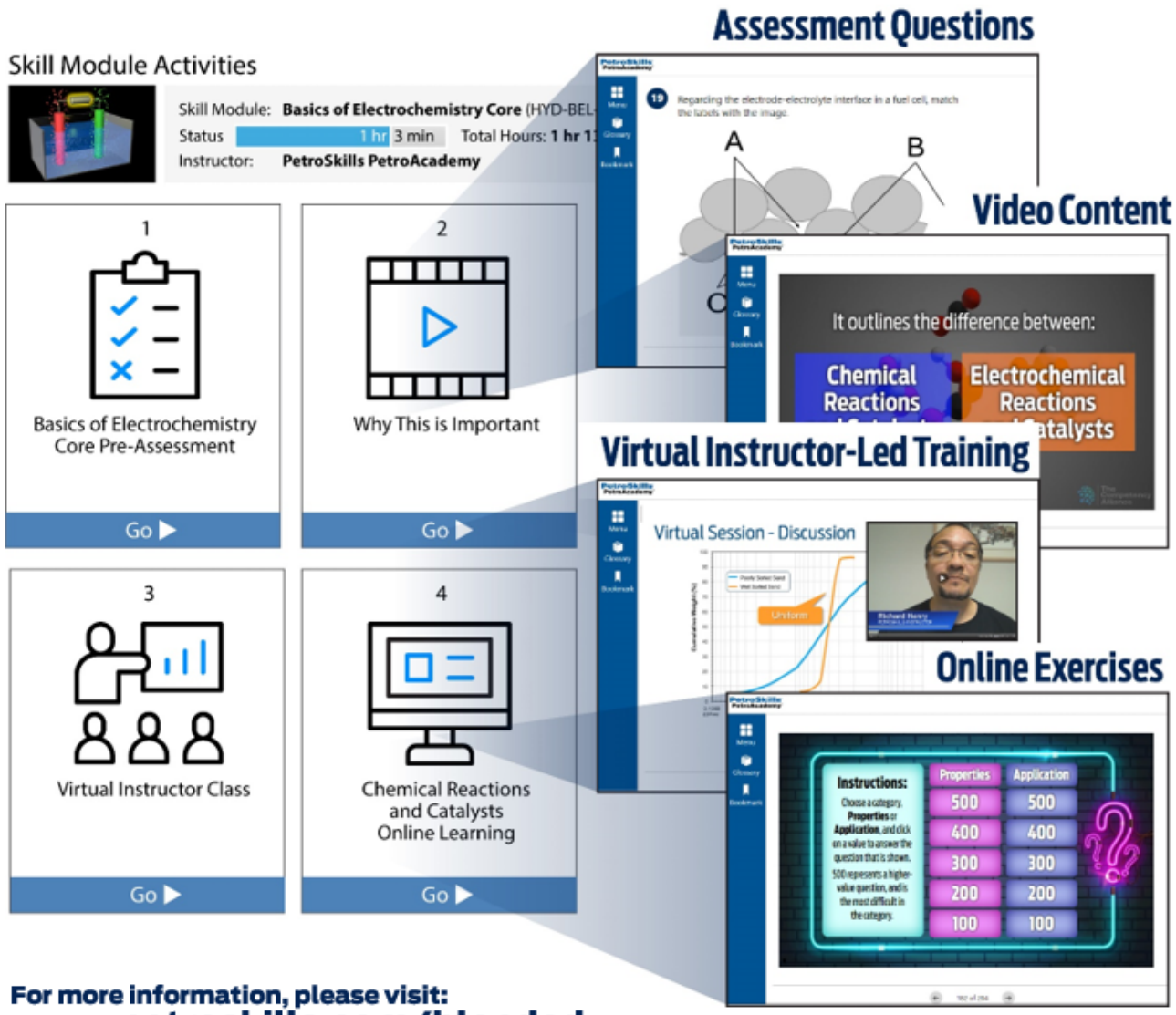
THE COMPETENCY ALLIANCE
ELEARNING SOLUTIONS

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.25.03 Mar-2025

eLearning Courses by Sector

Multi-Sector

Basic (Level 1)

ALL-AFC-1-C	Alternative Fuels	Released
ALL-BAR-1-C	Business Aspects of Global Warming and Alternative Energies	Released
ALL-CPF-1-C	Coherent Planning for the Future	Released
ALL-EPG-1-C	Existing Power Generation Technologies with Alternative Energies	Released

Carbon Capture

Basic (Level 1)

CCP-PPB-1-N	CO_2 Properties, Phase Behavior, and Compression	Coming soon
CCA-CCU-1-N	Carbon Capture, Utilization, and Storage	Released
CCP-DAC-1-N	Introduction to Direct Air Capture (DAC)	Coming soon

Foundation (Level 2)

CCP-CHP-2-N	CO_2 Capture for Hydrogen Production	Coming soon
CCP-OXF-2-N	Carbon Capture and Oxyfiring	Coming soon
CCP-CSP-2-N	Carbon Capture Case Studies and Operating Projects	Coming soon
CCP-PCA-2-N	Carbon Capture Using Post-Combustion Adsorbents	Released
CCP-PCM-2-N	Carbon Capture Using Post-Combustion Membranes	Released
CCP-PCS-2-N	Carbon Capture Using Post-Combustion Solvents	Released
CCP-PCC-1-N	Cost of Post-Combustion Solvent Capture	Released
CCP-LCH-2-N	Colored Hydrogen Overview and Precombustion Hydrogen Production	Coming soon

Carbon Sequestration

Basic (Level 1)

CSQ-CCC-1-N	The Case for Carbon Capture and Storage	Released
CSQ-CTS-1-N	CCS Capture, Transport, and Storage	Released
CSQ-VCB-1-N	CCS Value Chain, Business Models, and Commercial Drivers	Released
CSQ-STC-1-N	CO_2 Storage Concerns	Released
CSQ-STD-1-N	CO_2 Storage Design	Released
CSQ-SOP-1-N	CO_2 Storage Operations	Coming soon
CSQ-SRM-1-N	CO_2 Storage Resource Management System (SRMS)	Released
CSQ-SWS-1-N	CO_2 Storage Workflows	Released
CSQ-GCS-1-N	Geologic Carbon Storage	Released

Geothermal

GET-DUA-1-R	Direct Use Applications of Geothermal	Coming soon
GET-ELP-1-R	Geothermal Electricity Production	Released
GET-EBA-1-R	Geothermal Energy Benefits and Applications	Released
GET-NDG-1-R	Nature and Dynamics of Geothermal Systems	Released

Greenhouse Gas

Basic (Level 1)

GHG-CCR-1-N	Climate Change Risk and Opportunities Assessment	Released
GHG-DSG-1-N	Defining the Scope of the Greenhouse Gas Forecast	Released
GHG-DBN-1-N	The Drivers Behind Net-Zero	Released
GHG-INV-1-N	Greenhouse Gas Emissions Inventory Quality Management	Released
GHG-REP-1-N	Greenhouse Gas Emissions Reporting Requirements	Released
GHG-QUA-1-N	Greenhouse Gas Emissions Sources and Quantification	Released
GHG-TRA-1-N	Greenhouse Gas Emissions Tracking Over Time	Released
GHG-GGE-1-N	Introduction to Greenhouse Gas Emissions	Released
GHG-IES-1-N	Introduction to Greenhouse Gas Emissions Forecasting	Released
GHG-MES-1-N	Mapping Greenhouse Gas Emission Sources in the Oil and Gas Industry	Released
GHG-OPB-1-N	Operational Boundaries for Greenhouse Gas Inventories	Released
GHG-ORB-1-N	Organizational Boundaries for Greenhouse Gas Inventories	Released
GHG-SCO-1-N	Scope 1 and Scope 2 Greenhouse Gas Emissions – An Introduction	Released
GHG-SC3-1-N	Scope 3 Greenhouse Gas Emissions – An Introduction	Released

Foundation (Level 2)

GHG-ASF-2-N	Assumptions for Greenhouse Gas Forecasting and Developing Intervention Timelines	Released
GHG-BAU-2-N	Establishing Baseline(s) and Projecting Business as Usual (BAU) Greenhouse Gas Emissions	Released
GHG-IEX-2-N	Factors That Impact the Greenhouse Gas Forecast Fundamentals	Released
GHG-QCA-2-N	Greenhouse Gas Forecasting Quality Control, Assurance, and Reporting	Released
GHG-IRF-2-N	Identifying Risk in Greenhouse Gas Forecasting	Released
GHG-WOG-2-N	Working with Greenhouse Gas Emissions Factors	Released

Hydrogen

Basic (Level 1)

HYD-BEL-1-N	Basics of Electrochemistry	Released
HYD-DIS-1-N	Distribution Methods of Hydrogen	Released
HYD-GAL-1-N	Electrochemical Cells	Released
HYD-ELP-1-N	Electrochemical Processes	Released
HYD-HTF-1-N	High Temperature Fuel Cells and Electrolyzers	Released
HYD-COS-1-N	Hydrogen Compression and Storage	Released
HYD-HOV-1-N	Hydrogen Overview	Released
HYD-HPS-1-N	Hydrogen Process Safety	Released
HYD-PRO-1-N	Hydrogen Production	Released
HYD-HUC-1-N	Hydrogen Use Cases and Derivatives	Released
HYD-LTF-1-N	Low Temperature Fuel Cells and Electrolyzers	Released
HYD-SAF-1-N	Safety Aspects of Hydrogen	Released

Renewables

Basic (Level 1)

EST-ESC-1-R	Energy Storage	Released
SOL-SPG-1-R	Solar Power Generation	Released
WIN-WPG-1-R	Wind Power Generation	Released

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-FDO-1	The Future of the Digital Oilfield	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-UML-1	Unsupervised Machine Learning and Clustering	Released

Overview of Net-Zero and Renewables

ABOUT THIS SERIES

Globally, there is an ongoing shift in energy production away from fossil fuels and towards energy sources with lower carbon footprints. The primary objective of this series is to give an overview of the various available technologies and their pros and cons.

This series covers the political and business drivers for reducing CO_2 emissions and introduces the various technologies being introduced and researched. It is useful for anyone involved in strategic planning and implementing strategies that satisfy national, international, and company requirements for reducing greenhouse gas emissions in power generation environments.

Candidates can take the following self-paced eLearning courses individually or as a **9-hour online series. A** Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
The Drivers Behind Net-Zero	Level 1	1.5 hrs
Business Aspects of Global Warming and Alternative Energies	Level 1	1 hr
Existing Power Generation Technologies with Alternative Energies	Level 1	2 hrs
Carbon Capture, Utilization, and Storage	Level 1	2 hrs
Alternative Fuels	Level 1	1.5 hrs
Solar Power Generation	Level 1	1.5 hrs
Wind Power Generation	Level 1	3.5 hrs
Energy Storage	Level 1	1.5 hrs
Coherent Planning for the Future	Level 1	1.5 hrs

DESIGNED FOR

Senior and middle management and for anyone involved in the integration of low carbon power generation technologies into existing and future infrastructure.

LEVEL: Basic (Level 1)

COMING SOON

Carbon Capture from Stationary Industrial Sources

ABOUT THIS SERIES

Globally, there is an ongoing shift in energy production away from fossil fuels and towards energy sources with lower carbon footprints. The primary objective of this series is to provide an overview of electrochemical engineering concepts, principles, and applications.

The first two eLearning courses provide the foundational aspects and definitions associated with the science and technology of electrochemical engineering. The remainder of the eLearning courses cover the practical aspects of fuel cells and electrolyzers, key components of the emerging hydrogen industry.

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		
Carbon Capture, Utilization, and Storage	Level 1	2 hrs
Carbon Capture Using Post-Combustion Solvents	Level 2	3 hrs
Carbon Capture Using Post-Combustion Membranes	Level 2	2 hrs
Carbon Capture Using Post-Combustion Adsorbents	Level 2	2 hrs
Cost of Post-Combustion Solvent Capture	Level 1	1 hr
Colored Hydrogen Overview and Precombustion Hydrogen Production	Level 2	1.5 hrs
CO_2 Capture for Hydrogen Production	Level 2	~3.5 hrs
Carbon Capture and Oxyfiring	Level 2	~3.5 hrs
CO_2 Properties, Phase Behavior, and Compression	Level 1	~3 hrs
Carbon Capture Case Studies and Operating Projects	Level 2	~3.5 hrs

DESIGNED FOR

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

LEVEL: Basic (Level 1)

COMING SOON

Commercial Assessment for Carbon Storage

ABOUT THIS SERIES

Carbon Capture and Storage projects are being viewed as an important existing technology to aid in meeting global CO_2 reduction targets. This eLearning series is intended to provide a summary of CCS, including the CCS value chain, project life cycles, and the basics of CO_2 capture and transportation. Several courses take a deeper dive into the geologic storage of captured CO_2, from screening prospects to storage design and issues and concerns unique to geologic CO_2 storage. The Storage Resource Management System (SRMS), storage operations, and post-injection monitoring are summarized. Several global case studies of current projects are summarized to highlight lessons learned from these important early mover projects. Government and policy influence on commercial outcomes are reviewed along with typical project timelines and cost drivers. The series is helpful for anyone seeking a comprehensive "beginning to end" summary of the elements of CCS projects. Petrotechnical practitioners will benefit from the CO_2 storage modules, contrasting workflows with typical oil and gas prospecting and development.

Candidates can take the following self-paced eLearning courses individually or as a **~23-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
The Case for Carbon Capture and Sequestration	Level 1	2 hrs
CCS Capture, Transport, and Storage	Level 1	3 hrs
Geologic Carbon Storage	Level 1	2.5 hrs
CO_2 Storage Workflows	Level 1	2.5 hrs
CO_2 Storage Resource Management System (SRMS)	Level 1	1.5 hrs
CO_2 Storage Concerns	Level 1	2.5 hrs
CO_2 Storage Design	Level 1	2 hrs
CO_2 Storage Operations	Level 1	~3 hrs
CCS Value Chain, Business Models, and Commercial Drivers	Level 1	2.5 hrs

DESIGNED FOR

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

LEVEL: Basic (Level 1)

COMING SOON

Understanding Geothermal and Uses

ABOUT THIS SERIES

Geothermal energy is a renewable energy source encompassing two major energy sectors: heat production and electricity generation. Unlike other intermittent renewable energy sources, geothermal energy is continually generated through natural geological processes. Consequently, it is a base-load resource with zero carbon emissions and minimal land-use impact.

This series introduces the primary applications of geothermal energy, outlines the fundamental principles of heat transfer mechanisms in the Earth's crust, and describes geothermal plays and reservoirs associated with various geological settings.

Candidates can take the following self-paced eLearning courses individually or as a **~12-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Geothermal Energy Benefits and Applications	Level 1	3.5 hrs
Nature and Dynamics of Geothermal Systems	Level 1	3.2 hrs
Direct Use Applications of Geothermal	Level 1	~3 hrs
Geothermal Electricity Production	Level 1	4 hrs

DESIGNED FOR

Professionals seeking to acquire fundamental knowledge of geothermal energy and its primary applications (awareness level) will find this series particularly valuable. Given that numerous oil and gas industry skills, such as exploration, drilling, and reservoir engineering, directly translate to geothermal projects, this series will be especially beneficial for professionals in these fields.

LEVEL: Basic (Level 1)

Introduction to Greenhouse Gas Management, Accounting, and Reporting

ABOUT THIS SERIES

Climate change is a key sustainable development issue, and transitioning to a low-carbon economy is now imperative. Most governments are taking steps to reduce Greenhouse Gas (GHG) emissions through national policies that include introducing emissions trading programs, voluntary programs, carbon or energy taxes, and regulations and standards on energy efficiency and emissions.

Organizations must understand and manage their GHG risks to ensure long-term success and be prepared for future national or regional climate policies. A well-designed and maintained corporate GHG inventory (carbon footprint) is essential to managing these risks effectively. This series will provide fundamental knowledge about GHG emissions, including identification, management, mitigation, and reduction; quantification; consolidation into different scopes and inventories; and reporting.

Candidates can take the following self-paced eLearning courses individually or as a **14-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Introduction to Greenhouse Gas Emissions	Level 1	2 hrs
Organizational Boundaries for Greenhouse Gas Inventories	Level 1	1.5 hrs
Operational Boundaries for Greenhouse Gas Inventories	Level 1	1 hr
Greenhouse Gas Emissions Sources and Quantification	Level 1	2 hrs
Greenhouse Gas Emissions Tracking Over Time	Level 1	1 hr
Greenhouse Gas Emissions Inventory Quality Management	Level 1	2 hrs
Climate Change Risk and Opportunities Assessment	Level 1	1.5 hrs
Greenhouse Gas Emissions Reporting Requirements	Level 1	1.5 hrs
Scope 1 and 2 Greenhouse Gas Emissions – An Introduction	Level 1	2 hrs
Scope 3 Greenhouse Gas Emissions – An Introduction	Level 1	1.5 hrs

DESIGNED FOR

Anyone wanting to commence their learning or further consolidate their knowledge and competence regarding Greenhouse Gas (GHG) management.

LEVEL: Basic (Level 1)

Forecasting Greenhouse Gas Emissions Fundamentals

ABOUT THIS SERIES

Predicting and forecasting greenhouse gas emissions is especially important considering the regulatory environment and possible safety and environmental impacts. This series will cover the identification of emission modes, how to reduce such emissions, and finally, how to identify the optimal techniques and technologies to reduce emissions to more acceptable levels. This series will equip you with the skills and knowledge to analyze and forecast greenhouse gas emissions. Throughout the series, we will delve into various aspects of emissions forecasting, from fundamental concepts to advanced methodologies.

Candidates can take the following self-paced eLearning courses individually or as a **24-hour online series**.

eLearning Course Name		
Introduction to Greenhouse Gas Emissions Forecasting	Level 1	3 hrs
Defining the Scope of the Greenhouse Gas Forecast	Level 1	2.5 hrs
Mapping Greenhouse Gas Emission Sources in the Oil and Gas Industry	Level 1	2 hrs
Factors That Impact the Greenhouse Gas Forecast Fundamentals	Level 2	1.5 hrs
Working with Greenhouse Gas Emissions Factors Fundamentals	Level 2	2 hrs
Establishing Baseline(s) and Projecting Business as Usual (BAU) Greenhouse Gas Emissions Fundamentals	Level 2	3 hrs
Assumptions for Greenhouse Gas Forecasting and Developing Intervention Timelines Fundamentals	Level 2	3.5 hrs
Identifying Risk in Greenhouse Gas Forecasting Fundamentals	Level 2	2 hrs
Greenhouse Gas Forecasting Quality Control, Assurance, and Reporting Fundamentals	Level 2	4.5 hrs

DESIGNED FOR

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing Greenhouse Gas (GHG) emissions.

LEVEL: Basic (Level 1) | Foundation (Level 2)

Introduction to Hydrogen

ABOUT THIS SERIES

Globally, there is an ongoing shift in energy production away from fossil fuels and towards energy sources with lower carbon footprints. The primary objective of this series is to give an overview of the fundamentals of hydrogen and how it can be used as an energy carrier.

This series offers a comprehensive overview of hydrogen, a versatile and promising element poised to revolutionize various industries and contribute to a sustainable future. Throughout this series, you will explore the key properties and characteristics of hydrogen, production methods, carbon intensity, storage, and distribution to potential use cases. Finally, it covers safety aspects, such as how hydrogen can be produced, stored, distributed, and used safely. its historical significance, current uses, and emerging applications. This series will provide a solid foundation to understand its significance and explore its vast potential in shaping the future of energy and industry.

Candidates can take the following self-paced eLearning courses individually or as a **15-hour online series**. A Continuing Education Units (CEU) certificate is issued upon completion.

eLearning Course Name		
Hydrogen Overview	Level 1	2 hrs
Safety Aspects of Hydrogen	Level 1	2.5 hrs
Hydrogen Production	Level 1	2.5 hrs
Hydrogen Compression and Storage	Level 1	2 hrs
Distribution Methods of Hydrogen	Level 1	1 hr
Hydrogen Use Cases and Derivatives	Level 1	2 hrs
Hydrogen Process Safety	Level 1	3 hrs

DESIGNED FOR

This course is useful for anyone interested in an awareness of what hydrogen is and how it can be used in the energy and transport industries to assist in the energy transition to a lower carbon emitting future.

LEVEL: Basic (Level 1)

Foundations of Electrochemical Engineering

ABOUT THIS SERIES

Globally, there is an ongoing shift in energy production away from fossil fuels and towards energy sources with lower carbon footprints. The primary objective of this series is to provide an overview of electrochemical engineering concepts, principles, and applications.

The first two eLearning courses provide the foundational aspects and definitions associated with the science and technology of electrochemical engineering. The remainder of the eLearning courses cover the practical aspects of fuel cells and electrolyzers, key components of the emerging hydrogen industry.

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		
Basics of Electrochemistry	Level 1	2.5 hrs
Electrochemical Processes	Level 1	1.5 hrs
Electrochemical Cells	Level 1	2 hrs
Low Temperature Fuel Cells and Electrolyzers	Level 1	2 hrs
High Temperature Fuel Cells and Electrolyzers	Level 1	1.5 hrs

DESIGNED FOR

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

LEVEL: Basic (Level 1)

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 **30-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)

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 is 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 **~23-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)

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 Sector

Alternative Fuels
[ALL-AFC-1-C]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course covers the following topics:

- Coal, Oil, Gas
  - Traditional Power Generation
  - Integrated Gas Turbine Combined Cycle
- Hydroelectric
  - Nuclear Power Generation
  - Generation I, II, III, IV
- Nuclear Safety
- Geothermal
- Ocean
  - Mechanical
  - Thermal

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- List the various power production alternatives
- Describe traditional power generation techniques
- Describe turbines and boilers
- Describe waste heat recovery processes

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Business Aspects of Global Warming and Alternative Energies
[ALL-BAR-1-C]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1 hr

This eLearning course covers the following topics:

- How big is big – how much hydrocarbon usage do we need to displace?
- Carbon net zero
- Energy costs
- Life cycle assessment

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Gain an insight into how global business is affected by climate change policies
- Quantify the impact of CO_2 reduction and the predicted infrastructure requirements through the lens of power generation
- Describe the Life Cycle Assessment (LCA) process

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Coherent Planning for the Future
[ALL-CPF-1-C]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course covers the following topics:

- Learning from planning failures
- The future of fossil fuel production
- Integrating electrical generation
- Predicting the cost of generation

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Describe the factors behind recent blackouts and high cost of energy across Europe and California
- Explain the concept of energy density, capacity, and total life cycle
- Explain the ‘real’ cost of renewable energy
- Describe power supply and demand
- Describe planning and costing of renewable energy

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Existing Power Generation Technologies with Alternative Energies Core [ALL-EPG-1-C]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course covers the following topics:

- Coal, Oil, Gas
  - Traditional Power Generation
  - Integrated Gas Turbine Combined Cycle
- Hydroelectric
  - Nuclear Power Generation
  - Generation I, II, III, IV
- Nuclear Safety
- Geothermal
- Ocean
  - Mechanical
  - Thermal

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- List the various power production alternatives
- Describe traditional power generation techniques
- Describe turbines and boilers
- Describe waste heat recovery processes

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Carbon Capture, Utilization, and Storage [CCP-CCU-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course provides a 30,000-foot view of the emerging field of CO_2 capture from stationary industrial emissions sources – primarily combustion operations. CO_2 capture is part of the so-called "CCUS" chain – CO_2 Capture, Utilization, and Storage – wherein CO_2 is prevented from entering the atmosphere by removing it from flue gas or other vent streams, transported to an appropriate location, and injected deep underground into secure geologic formations or utilized.

The content parallels the information covered in depth in the PF-82 Carbon Capture from Stationary Industrial Sources course. PF-82 focuses on CO_2 Capture technology – both commercial and emerging – and background science.

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Describe the scale of CO_2 emissions and their impact
- Identify the major industrial emissions sources and their characteristics
- Explain the meaning of CCUS
- Recognize the major technology approaches to CO_2 capture and which are deployed
- Identify the CCS value chain
- Review the drivers and restrainers to deployment

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Carbon Capture Using Post-Combustion Adsorbents Fundamentals [CCP-PCA-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This eLearning course delves into the principles and challenges of post-combustion CO_2 capture using solid adsorbents. It discusses flue gas characteristics, adsorption operations, and the latest research on new adsorbents like Metal Organic Frameworks (MOFs). You will explore Pressure Swing Adsorption (PSA) and Temperature Swing Adsorption (TSA) cycles, their advancements, and current obstacles. It also evaluates the readiness of adsorption technology for large-scale use and its Technology Readiness Level, providing a thorough understanding of CO_2 capture technologies.

Designed for

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

You will learn how to

- Define the basic characteristics of the post-combustion capture approach
- Identify the characteristics of flue gas that make selective removal of CO_2 difficult
- Identify the operating principles of adsorbents
- Establish the difference between physisorption and chemisorption
- State the potential benefits of solid adsorbents for CO_2 capture
- Establish the difference between PSA and TSA process cycles
- Identify the current research work on new adsorbents for CO_2 capture, especially Metal Organic Frameworks
- State why an adsorbent that achieves high CO_2 loading is not necessarily a good adsorbent
- Identify advanced PSA cycles for CO_2 capture and state why progress has slowed down recently
- Identify the progress for TSA using circulating solids and innovative rapid cycle TSA
- Explain why adsorption is not yet ready for large-scale demonstration and state the Technology Readiness Level for adsorbent-based CO_2 capture

This eLearning course is included in the Carbon Capture from Stationary Industrial Sources eLearning series.

Carbon Capture Using Post-Combustion Membranes Fundamentals [CCP-PCM-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This eLearning course offers a comprehensive overview of post-combustion CO_2 capture, with a focus on polymeric membranes. You will learn about the basic characteristics of the post-combustion capture approach and its importance in reducing greenhouse gas emissions from industrial sources. The course covers the challenges of selectively removing CO_2 from flue gas, which contains various other gases and impurities. It delves into the operating principles of CO_2 separation using polymeric membranes, explaining how these membranes selectively allow CO_2 to pass through while blocking other gases. It addresses the Technology Readiness Level (TRL) of membrane capture, assessing the maturity and commercial viability of these technologies.

Designed for

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

You will learn how to

- Define the basic characteristics of the post-combustion capture approach
- Identify the characteristics of flue gas that make selective removal of CO_2 difficult
- Identify the operating principles of CO_2 separation using polymeric membranes
- Identify the main operating costs for polymeric membrane systems
- State the pros and cons of polymeric membranes for post-combustion CO_2 capture
- Describe and compare the different membrane systems available for post-combustion capture
- State the Technology Readiness Level (TRL) of membrane capture

This eLearning course is included in the Carbon Capture from Stationary Industrial Sources eLearning series.

Carbon Capture Using Post-Combustion Solvents Fundamentals [CCP-PCS-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3 hrs

This comprehensive eLearning course delves into the intricacies of post-combustion CO_2 capture, a pivotal technology in reducing greenhouse gas emissions from fossil-fuel power plants. Participants will gain a thorough understanding of the fundamental principles, challenges, and advancements in this field.

Designed for

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

You will learn how to

- Define the basic characteristics of the post-combustion capture approach
- Identify the characteristics of flue gas that make selective removal of CO_2 difficult
- Explain what the most developed technology for post-combustion capture is
- Understand the difference between physical and chemical solvents and the type most applicable to post-combustion capture
- Explain the strengths and weaknesses of amine solvents for flue gas scrubbing
- Describe what aspects of CO_2 removal solvents contribute most to the all-in cost of CO_2 capture
- Identify the basic issues that must be addressed in selecting any solvent
- Describe and compare the different solvents and technologies available for post-combustion capture
- Determine what solvent alternatives to amine solvents are being developed and why

This eLearning course is included in the Carbon Capture from Stationary Industrial Sources eLearning series.

Colored Hydrogen Overview and Precombustion Hydrogen Production Fundamentals [CCP-LCH-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	1.5 hrs

This eLearning course provides a comprehensive overview of hydrogen production technologies and their role in decarbonizing the global economy. Participants will explore the various "colors" of hydrogen and understand their significance in terms of carbon emissions. The course will delve into the impact of low- or no-carbon hydrogen on efforts to reduce greenhouse gas emissions and transition to a sustainable energy future.

Designed for

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

You will learn how to

- Identify what the different “colors” of hydrogen mean
- Understand how low- or no carbon hydrogen can impact efforts to decarbonize the global economy
- Define the three main processes for making fossil fuel-based hydrogen
- Recognize what non-fossil-fuel-based hydrogen production technology has been practiced for decades
- Identify which commercial hydrogen production technology is the global workhorse
- Distinguish which characteristic of CO_2 produced by SMR hinders its use in a carbon-constrained environment
- Examine the main difference between Partial Oxidation (POX) and Autothermal Reforming (ATR)
- Evaluate which hydrogen production technologies are favored for very large volumes

This eLearning course is included in the Carbon Capture from Stationary Industrial Sources eLearning series.

Cost of Post-Combustion Solvent Capture [CCP-PCM-2-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1 hr

This eLearning course provides a comprehensive overview of the key factors influencing the cost of CO_2 capture. You will learn to identify reliable sources for cost estimates, understand how CO_2 concentration and scale significantly impact capture costs, and recognize the limitations of comparing cost estimates from various sources. By the end of this course, learners will be equipped with the knowledge to critically assess CO_2 capture cost data and make informed decisions in the context of environmental and economic considerations.

Designed for

This series provides a wide-ranging overview of CO_2 capture. It is suitable for interested parties, such as environmental staff, facilities engineers, and gas processing engineers, including entry-level (1-2 year) engineers, or anyone interested in a general, technically oriented overview of this approach to Greenhouse Gas (GHG) mitigation.

You will learn how to

- Identify reasonable sources of cost estimates for CO_2 capture
- Understand the large impact of CO_2 concentration and scale on the capture cost
- Understand the weaknesses of comparing cost estimates from different sources

This eLearning course is included in the Carbon Capture from Stationary Industrial Sources eLearning series.

Introduction to Direct Air Capture (DAC)
[CCP-DAC-1-N]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 2)	~4 hrs

This eLearning course offers a comprehensive introduction to Direct Air Capture (DAC) and Carbon Dioxide Removal (CDR) technologies. Participants will understand the necessity of CDR, differentiate between CDR and Carbon Capture & Storage (CCS), and learn about the current status of CDR technologies. The course covers DAC's role in climate mitigation, technical aspects of DAC technologies, and pathways for carbon storage and utilization, while addressing challenges, risks, and future trajectories of DAC adoption.

Designed for

Individuals seeking to understand the basics of carbon removal technologies and their role in addressing climate change.

You will learn how to

- Understand the necessity of large-scale CDR to meet climate targets
- Differentiate between CDR, CCS, and DAC
- Explore the current status and challenges of CDR technologies
- Learn about DAC's role in achieving net-negative emissions
- Compare DAC to point-source carbon capture
- Examine key performance metrics of DAC technologies
- Gain insights into solid sorbent-based, liquid solvent-based, electrochemical, and adsorption-based DAC technologies
- Review case studies of leading DAC projects and technologies
- Explore geological storage options and CO_2 utilization in industrial processes
- Understand the lifecycle impacts and the concept of a circular carbon economy
- Identify major barriers to DAC adoption, including energy and resource constraints
- Discuss future outlooks and innovation pathways for DAC improvement
- Review policy recommendations for enabling large-scale DAC deployment

The Case for Carbon Capture and Storage [CSQ-CCC-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, we will explore why CCS is a necessary technology in the race to reduce greenhouse gases. A high-level discussion on Climate Science, how the natural global carbon cycle works, and the role of manmade CO_2 emissions. We will examine what makes up greenhouse gases, which ones are important from a climate perspective, and where they come from. We explore what "Net Zero" means, why it is essential, and the role of CCS in achieving net zero. The eLearning course wraps up with a high-level discussion of the CCS steps of capture, transportation, and storage, the context of size, how CO_2 and emissions are measured, and the basic properties of CO_2.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations, who want a basic introduction to why CCS is a vital technology employed to meet net-zero targets.

You will learn how to

- Identify Carbon Capture and Sequestration (CCS) as a method of reducing carbon emissions with the potential to reduce climate change
- Define CCS
- Explain the difference between CCS and CCUS
- Explain how CCS aligns with today's energy economy
- Recognize CCS as one of several key solutions in the world's emerging clean energy portfolio

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CCS Capture, Transport, and Storage [CSQ-CTS-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course covers the basics of CCS projects and their life cycles. It includes a discussion of the unique blend of fundamentally different project types that make up a CCS project—a basic review of the technologies being utilized and developed for CO_2 Capture with relative costs. A high-level review of Direct Air Capture, its unique promises, and challenges are discussed. Basic transportation alternatives are presented with a focus on pipelines, CO_2 safety, and projected transportation infrastructure needed to achieve net zero.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations, who want a basic introduction to why CCS is a vital technology employed to meet net-zero targets.

You will learn how to

- Identify the three elements of a CCS project
- Explain global CCS Industry project timing benchmarks
- Recognize the TRL for various capture technologies
- Explain the basics of Direct Air Capture
- Identify the advantages/disadvantages of CCS hubs vs point to point project
- Compare and contrast the relative cost of capture for various technologies
- Identify and choose from the various methods available to transport CO_2

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CCS Value Chain – Business Models, Commercial Drivers and Economics [CSQ-VCB-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course considers the CCS value chain elements and discusses the value drivers for successful CCS projects. It presents timing, economics, business models, and some existing case studies of industry projects. Government support for CCS, including incentives and penalties, is discussed in a global context. The course also provides a high-level review of the carbon markets, both voluntary and compulsory, along with current trends.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Define the key components of the CCS value chain: capture, transportation, and storage
- Identify the stages of the CCS project lifecycle, including early development, FID, detailed design and construction, operations, and PISC
- Explain the role of government support, including regulatory incentives and penalties, in CCS project economics
- Understand full-chain and distributed CCS business models, with examples like Snøhvit and Summit Carbon
- List the differences between regulatory/compulsory carbon markets and voluntary carbon markets
- Describe how carbon credits are created, priced, and traded in voluntary markets
- Explain the role of carbon registries in voluntary carbon markets
- Describe how compulsory cap and trade systems incentivize companies to meet carbon reduction goals
- Identify the main cost components of CCS projects and predict which will most influence project economics
- Explain the differences between O&G and CCS project monetization

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CO_2 Storage Concerns
[CSQ-STC-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course focuses on specific technical details unique to CO_2 storage and the specific areas of concern that should be evaluated to reduce the risk of a storage project. These include the protection of freshwater aquifers, containment, injection rate, capacity, and external conflicts.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Identify the key criteria that drive elevated risks for storage projects
- Identify the phases in the storage workflow for CO_2 storage projects
- Understand the principles of containment in the context of CCS and its importance in being permanently secured as well as preventing the migration of CO_2 and other fluids into USDW
- Define seal integrity and recognize the characteristics of effective seals and the geological features that contribute to maintaining seal integrity
- Analyze the impact of geological faults and fractures on seal integrity
- Predict the rate and evaluate/quantify the effect of in-situ stresses and fractures on injectivity
- Describe the impact of completion type in a well affects its ability to flow, how formation damage occurs, and its impact on well productivity, including injectivity
- Explore the dynamics of CO_2 storage in freshwater and saline aquifers
- Understand how injection rates, well counts, and maintenance schedules impact CCS project planning and economics
- Understand the various conflicts that may arise during CO_2 storage planning in the surface and subsurface
- Explain what surface characteristic criteria are important to consider when evaluating potential storage sites
- Understand the concept of pressure space and its impact on adjacent injection projects and/or hydrocarbon production
- Define how regulations or legislation may impact the potential conflict of subsurface injection and hydrocarbon production

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CO_2 Storage Design
[CSQ-STD-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course discusses continuous improvement and risk reduction concepts for specific storage projects. It discusses the use of reservoir flow modeling for design and, ultimately, the use of full field models to optimize injector and monitor well placement and define the Area of Review. The course also discusses the use of monitoring wells as tools to provide insight into storage progress and as indicators of containment problems.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Explain the importance of a continuous improvement cycle in CO_2 storage
- Identify the key stages of project development from screening to post-injection operations
- Describe the confidence level improvement with successive workflow steps in storage development
- Identify the key flow modeling output and how it is used to design a storage project
- Describe how flow modeling predicts plume behavior and supports decisions on well placement and storage capacity
- Identify the geologic parameters that influence CO_2 plume behavior
- Describe various diagnostic plots used to evaluate storage project design
- Explain the impact of inter-well pressure and plume interactions on well placement and injection efficiency within CO_2 storage projects
- Define the Area of Review (AOR) using reservoir simulation to predict plume geometry and critical pressure fronts
- List the monitoring well types utilized in CCS projects
- Describe how strategically placed monitoring wells validate flow models, ensure plume containment, and detect potential risks within CO_2 storage projects

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CO_2 Storage Operations
[CSQ-SOP-1-N]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~3 hrs

This eLearning course investigates well construction, storage surface facilities, baseline data and storage monitoring, injection operations, and post injection operations. A high-level review of each topic is discussed, including elements unique to subsurface geologic storage and properties of CO_2. Well construction describes the unique features of storage wells, including corrosion concerns and long-term monitoring equipment. The importance of significant baseline monitoring data and examples of monitoring plans are described to ensure permanent storage effectively.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Explain the unique design elements of a CO_2 storage injection well
- Describe and plan the basic elements of the surface facilities for a storage project
- Explain the necessary elements to consider for safe injection and monitoring operations
- Describe the monitoring equipment to be considered for use in an injection or monitor well
- Implement an effective monitoring program for a CO_2 storage project with effective baseline data
- Describe what the post injection monitoring phase is and why it is necessary

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CO_2 Storage Resource Management System (SRMS) [CSQ-SRM-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course provides an overview of the Storage Resource Management System (SRMS) adopted by the Society of Petroleum Engineers, which is analogous to the PRMS system used to define Petroleum Reserves. It also discusses the evaluation matrix defined by the SRMS, which defines the range of uncertainty of a storage resource against a range of commerciality.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Define the purpose of the SRMS and explain its significance in CO_2 storage projects
- Identify the core components of the SRMS Guidelines, including classifications and requirements
- Describe the relative maturity of a CCS project and storage component using the SRMS guidelines
- Understand the origin and purpose of the SRMS
- Describe the criteria for classifying CO_2 storage projects
- Understand the significance of the discovered and undiscovered resource classifications in evaluating storage sites List the requirements for a CO_2 storage project to achieve commercial status
- Describe the analysis and criteria for a project to move from sub-commercial to commercial status
- Define the relative maturity of the undiscovered sub-categories of prospect, lead and play
- Define the characteristics of "Capacity," "Contingent," and "Prospective“ storage resources
- Apply the commerciality test criteria for a CCS project to determine capacity

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

CO_2 Storage Workflows [CSQ-SWS-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course focuses on screening, how and where to acquire the necessary data to evaluate a storage prospect, and the technical disciplines needed to evaluate storage prospects and adequately reduce storage risks. It covers trapping and storage mechanisms and the basic use of geologic (static) models and reservoir (flow) models to define storage resources.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Identify the phases in the CO_2 storage workflow
- Define screening parameters for evaluating carbon storage sites
- Compare oil and gas trapping mechanisms with CO_2 storage
- Understand geological and flow modeling roles in CO_2 storage
- Identify key features for evaluating storage projects
- Define the four primary CO_2 storage mechanisms
- Describe the contributions of each CO_2 trapping mechanism over time
- Identify the relative storage surety of trapping mechanisms Understand methods to estimate CO_2 storage capacity
- Describe data needed for volumetric CO_2 storage estimates
- Explain the use of reservoir simulation for CO_2 storage
- Describe how boundary conditions influence CO_2 storage efficiency
- Identify data types required for geological and reservoir modeling
- Describe the influence of data scale on CCS modeling effectiveness
- Recognize the importance of uncertainty analysis in subsurface projects

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

Geologic Carbon Storage [CSQ-GCS-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course covers the basic requirements for viable geologic or subsurface storage of CO_2. It includes a review of the attributes needed for a good project and compares the different types of storage currently being implemented. The course also reviews a high-level workflow for screening projects and examples of projects in the industry.

Designed for

Technical or non-technical audiences, including engineers, geoscientists, finance, accounting, and operations professionals who want a basic understanding of the project life cycle, the fundamentals of CO_2 capture and technology readiness, and transportation options.

You will learn how to

- Differentiate the various types of geologic storage being utilized in the industry
- Identify the subsurface workflow needed to fully define a storage project
- Explain the differences between saline aquifer storage, depleted oils and gas field storage, and EOR Identify the data needed to initiate a CCS project, a design basis related to the CCS value chain
- Compare and contrast subsurface oil and gas workflows compared to CO_2 storage

This eLearning course is included in the Commercial Assessment for Carbon Storage eLearning series.

Direct Use Applications of Geothermal
[GET-DUA-1-R]

STATUS	LEVEL	DURATION
Coming soon	Basic (Level 1)	~2 hrs

This eLearning course describes direct use applications and the technology and components required to do this.

Designed for

Professionals seeking to acquire fundamental knowledge in geothermal energy and its primary applications (awareness level) will find this program particularly valuable.

You will learn how to

- Define the geologic settings and temperature range of direct use applications
- Describe district heating and cooling applications, components, and installations
- Describe geothermal heat pumps and installation

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Geothermal Energy Benefits and Applications
[GET-EBA-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3.5 hrs

This eLearning course discusses the origin of geothermal energy and its history, identification of the various low and high enthalpy applications, and their respective benefits.

Designed for

Professionals seeking to acquire fundamental knowledge in geothermal energy and its primary applications (awareness level) will find this program particularly valuable.

You will learn

- How the Earth's internal heat drives geothermal energy and main notions of the domain
- The origin and benefits of geothermal energy
- How to define low enthalpy geothermal energy and its direct use
- How to define high enthalpy geothermal and production of electricity

This eLearning course is included in the Understanding Geothermal and Uses eLearning series.

Geothermal Electricity Production
[GET-ELP-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	4 hrs

This eLearning course describes geothermal production of electricity for conventional and Enhanced Geothermal Systems (EGS).

Designed for

Professionals seeking to acquire fundamental knowledge in geothermal energy and its primary applications (awareness level) will find this program particularly valuable.

You will learn how to

- Define conventional geothermal through various examples of active geothermal fields
- Define Enhanced Geothermal System (EGS) for hot dry rocks environment
- Characterize the specific challenges of each kind of geothermal field and define their advantages and disadvantages
- Explain the different types of geothermal power plants, including dry steam, flash steam, and binary cycle systems

This eLearning course is included in the Understanding Geothermal and Uses eLearning series.

Nature and Dynamics of Geothermal Systems [GET-NDG-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course discusses heat transfer mechanisms in Earth's crust, geological formation properties, and the development of geothermal systems.

Designed for

Professionals seeking to acquire fundamental knowledge in geothermal energy and its primary applications (awareness level) will find this program particularly valuable.

You will learn

- The three primary mechanisms of heat transfer: conduction, convection, and radiation
- How these mechanisms operate within the Earth and influence geothermal gradients in various tectonic contexts
- How different geological layers have varied thermal properties
- The importance of porosity and permeability in the characterization of potential geothermal reservoirs
- The methods used to identify potential geothermal plays, including geological surveys, geophysical studies, and exploratory drilling

This eLearning course is included in the Understanding Geothermal and Uses eLearning series.

Assumptions for Greenhouse Gas Forecasting and Developing Intervention Timelines [GHG-ASF-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3.5 hrs

This eLearning course focuses on the key assumptions that must be considered to create comprehensive GHG emissions forecasts. It also explores the importance of intervention timelines and how they can influence the outcomes of these forecasts.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Describe the factors that need to be considered when forecasting future production levels
- Outline the factors involved in the projection of future production levels in oil and gas industries
- Outline the external factors involved in the projection of future production levels in the oil and gas industries
- Describe the economic, geographical, and political factors that need to be considered when forecasting future production levels
- Determine how projections can be improved
- Describe the methods that can be used to refine output projections
- Describe what intervention timelines are and how they affect the outcomes of an emissions forecast
- Summarize the uses and implications of how different intervention timelines can affect an emissions forecast

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Climate Change Risk and Opportunities Assessment [GHG-CCR-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

Organizations must fully appreciate how to identify and respond to the risks and opportunities that global climate change presents. If these are not understood and planned for, an organization will not be resilient to future changes, such as extreme weather events, resource scarcity, and regulatory changes. There are also opportunities inherent in the transition to a low-carbon future that an organization will need to capitalize on to remain competitive.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Consider the risks and opportunities of climate change for an organization
- Review transition and physical risks for a company
- Review the need for scenario analysis
- Consider the GHG management hierarchy of eliminate, reduce, substitute, and compensate
- Review GHG emission reduction approaches
- Appreciate planning for net zero

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Defining the Scope of the Greenhouse Gas Forecast [GHG-DSG-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course considers how to define the scope and assessment boundaries of the GHG forecast. Defining scopes and boundaries is essential when developing GHG forecasts. This step ensures the forecast's accuracy, transparency, and comparability of the forecast.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Identify which types of emissions are measured and how much detail should be included
- Determine constraints for the planned forecast
- Identify key stakeholders and data sources necessary for comprehensive Greenhouse Gas forecasting
- Identify all operational activities that contribute to Greenhouse Gas emissions
- Describe the Greenhouse Gas accounting principles and their significance when preparing a Greenhouse Gas emissions forecast
- Analyze the broader organizational context to ensure inclusivity of all emissions sources based on their relevance and materiality
- Describe what boundaries are and why they matter
- Explain the importance of setting adequate organizational and operational boundaries

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

The Drivers Behind Net-Zero [GHG-DBN-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course covers the following topics:

- Global warming – the case for and against
- Greenhouse gases – what are they, and what do they do?
- Paris Accord/International Energy Agency/Intergovernmental Panel on Climate Change
- Environmental, Social, and Governance Risks (ESG)

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Define the terms “Climate Change” and “Global Warming”
- Explain the history of global temperature and carbon dioxide levels
- Describe the difference between 20-year and 100-year global warming effects
- Identify who are the authorities and governmental agencies
- Describe the effect of greenhouse emissions and associated risks to the environment

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Establishing Baseline(s) and Projecting Business as Usual (BAU) Greenhouse Gas Emissions Fundamentals [GHG-BAU-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	3 hrs

This essential eLearning course explains the concept of a baseline and highlights its importance, focusing on why establishing one is crucial. It also introduces BAU (Business as Usual) emissions, detailing the steps for developing a BAU scenario. It shows how to apply appropriate emissions factors and conduct sensitivity analyses.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Describe what a baseline is and why it matters
- Identify the requirements of baselines
- Determine how to select a base year for the baseline
- Distinguish between the fixed base year and the rolling base year approaches
- Outline the steps for compiling baseline emissions
- Distinguish the key drivers that influence GHG emissions
- Describe what Business as Usual (BAU) scenarios are and why they are important
- Determine the best approach to develop BAU scenarios
- Explain why BAU scenarios are critical when producing GHG emissions forecasts
- Identify the steps required to develop BAU scenarios

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Factors That Impact the Greenhouse Gas Forecast Fundamentals [GHG-IEX-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	1.5 hrs

In this eLearning course, you will gain an understanding of the commonly used approaches for modeling current and future GHG emissions. To include:

- Top-Down Approach - Examine the top-down methodology, which utilizes aggregated emissions data at the sectoral or national level to estimate GHG emissions.
- Bottom-Up Approach - Explore the bottom-up methodology, which involves aggregating emissions data from individual sources within an organization or sector.

Learn how to identify the internal and external factors that shape GHG emissions forecasts, highlighting the importance of considering a broad range of variables that can have an impact on a forecast.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Distinguish between top-down and bottom-up modeling
- Recognize what are marginal abatement cost curves
- Describe the application of waterfall charts when determining targets
- Identify the importance of considering relevant internal and external factors when preparing a GHG emissions forecast
- Identify pertinent internal factors and associated variables

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Greenhouse Gas Emissions Inventory Quality Management [GHG-INV-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course discusses quality management for greenhouse gas (GHG) emissions inventories produced by organizations. This is critical for the accuracy, reliability, and consistency of such inventories. It is important that organizations make strategic decisions and publish disclosures using data with high integrity.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Identify the risk areas within GHG data management
- Consider the principles of GHG data accounting
- Identify what processes and procedures are required
- Identify how and where GHG data errors arise
- Apply sense checking and vertical and horizontal checks
- Differentiate between GHG data auditing, validation and verification
- Characterize types of GHG data audits
- Design a GHG data audit process

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Greenhouse Gas Emissions Reporting Requirements [GHG-REP-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course discusses reporting requirements for greenhouse gas (GHG) emissions and their context. Disclosure requirements might include mandatory or voluntary obligations imposed by governments, regulatory bodies, or industry standards that compel organizations to disclose GHG data. Reporting GHG emissions with veracity and transparency is fundamental to an organization's integrity and reputation.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Ensure GHG reporting has integrity and determine what is mandatory to report
- Ensure compliance with the GHG Protocol and satisfy complex scope 2 reporting requirements
- Consider the different GHG reporting frameworks and standards
- Provide for regulatory compliance concerning GHG reporting in specific jurisdictions
- Apply ratio indicators
- Construct a good (practice) GHG report

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Greenhouse Gas Emissions Sources and Quantification [GHG-QUA-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	

This eLearning course discusses GHG emission sources and their quantification, which is crucial in understanding, addressing, and reducing their environmental impact. In sectors such as the oil and gas industry, emissions arise from diverse activities, including extraction, production, transportation, and refining processes. Quantifying these emissions involves standardized methods to provide reliable information. The integrity of GHG emissions quantification is vital to ensure that organizations implement viable strategies to reduce their impact.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Consider oil and GHG emissions, including those from combustion, venting, and fugitive sources
- Identify sources and sinks
- Follow a robust quantification process
- Manage exclusions
- Evaluate and use emission factors
- Consider other calculation factors required
- Apply GHG emissions calculations
- Consider assurance
- Evaluate the characteristics of activity data
- Identify the risks during the quantification process
- Decide upon aggregation strategies
- Appreciate the level of uncertainty

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Greenhouse Gas Emissions Tracking Over Time [GHG-TRA-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	

This eLearning course illustrates how greenhouse gas (GHG) emissions are tracked over time. It introduces the concept of a base year, its selection, justification, and recalculation. Furthermore, it explains significance thresholds and when a base-year recalculation is permissible. It also provides the opportunity to undertake an actual base-year recalculation.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Assess an organization's greenhouse gas (GHG) emissions over time
- Explain the concept of a base year
- Clarify the rules for recalculation of base-years
- Select a base year, and justify the selection
- Establish a base-year recalculation policy and process
- Consider significance thresholds
- Identify structural and organizational changes
- Undertake actual base-year recalculations

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Greenhouse Gas Forecasting Quality Control, Assurance, and Reporting [GHG-QCA-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	4.5 hrs

This comprehensive eLearning course is designed to equip participants with the knowledge and skills necessary to ensure the accuracy and reliability of greenhouse gas (GHG) emissions forecasts. By the end of this course, participants will be well-versed in the methodologies and best practices for quality control and assurance in GHG emissions forecasting, enabling them to produce reliable and credible emissions data.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Differentiate between the types of uncertainty when developing GHG emissions forecasts
- Outline the reasons why quality control is essential when developing GHG emissions forecasts
- Specify what are the critical components of a quality control approach
- Describe how to develop a quality management system and which technical components need to be included
- Differentiate between quality control, quality assurance, and verification activities
- Outline the relevant IPCC quality principles for historical GHG inventories to define quality that is used for quality control and quality assurance for GHG emissions forecasts
- Identify the significant elements of a quality control/quality assurance and verification system that need to be implemented in tracking forecast development
- Determine the key components to include in an emissions forecast report

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Identifying Risk in Greenhouse Gas Forecasting [GHG-IRF-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This eLearning course focuses on developing the skills needed to identify potential risks in GHG emissions forecasting and apply strategies to mitigate those risks. It also explores how these mitigation strategies can impact forecast development, helping to ensure that the results are both relevant and realistic.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Identify potential risks associated with developing GHG emissions forecasts and describe the potential impacts
- Outline the mitigation strategies and tools to address and reduce risks when developing GHG emissions forecasts

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Introduction to Greenhouse Gas (GHG) Emissions [GHG-GGE-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course introduces the factors contributing to climate change and the science behind greenhouse gas (GHG) emissions. It delves into the anthropogenic greenhouse gas effect, the Kyoto Protocol GHGs, the concept of global warming potential (GWP), GHG normalization to carbon dioxide equivalence, sources of GHGs, the GHG Protocol, key definitions, base-year selection, and fundamental principles for GHG quantification and reporting.

Designed for

Anyone wanting to commence their learning or further consolidate their fundamental knowledge and competence regarding Greenhouse Gas (GHG) management.

You will learn how to

- Identify the Kyoto Protocol GHGs and recognize their sources
- Explain global warming potentials (GWP)
- Appreciate that GHG emissions are reported in tonnes of carbon dioxide equivalence (tCO_2e)
- Describe the GHG Protocol
- Consider the base-year
- Identify the principles of GHG management and accounting

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Introduction to Greenhouse Gas Emissions Forecasting [GHG-IES-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course is vital to our comprehensive Forecasting Greenhouse Gas Emissions Fundamentals eLearning series. It serves as the foundation, providing you with the essential knowledge to navigate the complexities of forecasting greenhouse gas emissions effectively.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to:

- Understand the relationship between the energy transition and greenhouse gas emissions
- Identify the principal options used for abating greenhouse gas emissions
- Understand the two main greenhouse gas accounting methods to quantify emissions
- Gain a working understanding of the tools used to measure greenhouse gas emissions
- Understand the difference between absolute greenhouse gas emissions and greenhouse gas intensity Understand greenhouse gas inventories at project, asset, and portfolio levels
- Define forecasting and its relevance in managing future greenhouse gas emissions
- Understand the purpose and objectives of forecasting greenhouse gas emissions
- Gain a working understanding of the processes in forecasting greenhouse gas emissions

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Mapping Greenhouse Gas Emission Sources in the Oil and Gas Industry [GHG-MES-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course will help you understand the critical components in mapping GHG emissions sources within a boundary, the role of process flow diagrams, and the requirements and systemic process for collecting data to support GHG emissions forecasting.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Use the techniques to identify sources of greenhouse gases
- Quantify greenhouse gas emissions
- Analyze collected data
- Demonstrate the value of process flow diagrams (PFDs)
- Determine what types of PFDs are useful in working with GHGs
- Identify how collaborative teamwork can be used to identify GHG sources and develop GHG PFDs
- Identify what are the requirements when collecting data for a GHG project
- Determine the systematic process needed to collect and analyze relevant data streams

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Operational Boundaries for Greenhouse Gas Inventories [GHG-OPB-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1 hr

This eLearning course introduces operational boundaries in GHG emissions accounting, including categorizing GHG emissions into scopes 1, 2, and 3. It provides a clear understanding of the sources of both direct and indirect emissions.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn

- Define and distinguish between control and equity share operational boundaries
- Apply different greenhouse gas (GHG) emissions inventory consolidation approaches
- Account for GHG emissions within these different boundaries Interpret the various associated financial and equity definitions

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Organizational Boundaries for Greenhouse Gas Inventories [GHG-ORB-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course provides a comprehensive understanding of the critical role that organizational boundaries play in GHG emissions reporting. You will be able to navigate the complexities of control and equity share boundaries, apply relevant consolidation methods, and interpret financial and equity definitions.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Distinguish between control and equity share organizational boundaries
- Identify different greenhouse gas (GHG) emissions inventory consolidation approaches
- Explain GHG emissions within these different boundaries
- Review the various associated financial and equity definitions

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Scope 1 and 2 Greenhouse Gas Emissions – An Introduction [GHG-SCO-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course provides an overview of scope 1 and 2 greenhouse gas (GHG) emissions.

Scope 1 encompasses direct emissions from sources owned or controlled by an organization. Measuring and managing scope 1 emissions is fundamental to an organization's GHG accounting and integral to evaluating emission reduction strategies.

Scope 2 is indirect emissions associated with the generation of purchased energy consumed by an organization. These arise from the production of electricity, heat, or steam that an organization acquires from external sources. Scope 2 emissions quantification is essential for an organization's GHG inventory, but this is complicated by energy supply characteristics. Reliable carbon intensity data for these energy sources gives organizations opportunities to improve efficiency and transition to lower carbon alternatives.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Identify the main oil and gas sector scope 1 GHGs and understand their sources
- Identify and consider the different sources of Scope 2 GHG emissions
- Apply the GHG Protocol
- Appreciate the various complications with Scope 2 GHG emissions quantification
- Understand the sources of generation
- Quantify Scope 2 GHG emissions
- Appraise the sources of grid factors
- Differentiate and understand the location-based and market-based methods of Scope 2 quantification
- Consider electricity transmission and distribution losses
- Calculate Scope 2 GHG emissions
- Ensure a complete scope 1 and 2 GHG inventory

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Scope 3 Greenhouse Gas Emissions – An Introduction [GHG-SC3-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course provides an overview of scope 3 greenhouse gas (GHG) emissions. These indirect emissions occur in an organization's value chain, extending beyond its immediate control or ownership boundaries. Scope 3 emissions from upstream or downstream activities are complex and often challenging to quantify. However, they often represent the largest part of an organization's GHG inventory, so it is important for an organization to consider their scope 3 emissions during the transition to a low-carbon world.

Designed for

Anyone wanting to commence their learning or to further consolidate their fundamental knowledge and competence in Greenhouse Gas (GHG) management.

You will learn how to

- Identify and consider the different sources of Scope 3 GHG emissions
- Apply the GHG Protocol
- Appreciate the importance of Scope 3 emissions across the value chain
- Consider upstream and downstream Scope 3 categories
- Calculate specific Scope 3 GHG emissions categories
- Apply a structured quantification strategy
- Appraise different Scope 3 data sources
- Prioritize data collection
- Appreciate the specificity of the calculation method
- Consider disclosure requirements and net zero
  Identify Scope 3 reduction measures

This eLearning course is included in the Introduction to Greenhouse Gas Management, Accounting, and Reporting eLearning series.

Working with Greenhouse Gas Emissions Factors [GHG-WOG-2-N]

STATUS	LEVEL	DURATION
Released	Foundation (Level 2)	2 hrs

This essential eLearning course will help you understand emission factors, how they can be used to calculate GHG emissions, and how to forecast GHG emissions in future scenarios. It also reviews where emission factors can be sourced and how to select the most appropriate ones for each situation.

Designed for

Industry plant technical managers, engineers, maintenance personnel, project engineers, and engineering and technical personnel involved in managing greenhouse gas (GHG) emissions.

You will learn how to

- Recognize what emissions factors are, where they can be found, and how to use them
- Differentiate between emission factors and conversion factors
- Determine how to decide which emission factors to use
- Recognize what Global Warming Potential ratios are
- Use Global Warming Potential ratios to convert different GHG emissions into CO_2e emissions
- Use emission factors to calculate GHG emissions
- Distinguish between market-based and location-based Scope 2 emissions
- Recognize the role emission factors play when forecasting GHG emissions
- Use emission factors to forecast emissions

This eLearning course is included in the Forecasting Greenhouse Gas Emissions Fundamentals eLearning series.

Basics of Electrochemistry
[HYD-BEL-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

This eLearning course covers basic nomenclature, such as anode, cathode, electrodes, electrolyte, current density, polarization, open circuit voltage, and the influences of operating pressure and temperature. It also covers the difference between heterogeneous catalysis and electrocatalysts, thermodynamic and kinetic control of reactions, and the role of catalyst.

Designed for

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

You will learn how to

- Define the terms used in electrochemistry
- Determine the basic processes occurring in electrochemical systems
- Explain electrolyte conductivity
- Explain the two types of electrochemical cell
- Determine the function and purpose of electrodes
- Sketch and describe the Standard Hydrogen Electrode
- Outline chemical reactions and the role of catalysts
- Define reaction rates and activation energy
- Describe the Arrhenius equation
- Identify the triple-phase boundary reaction zones
- Outline the Nernst equation and how it used
- Describe the method of comparison between different electrodes
- Describe fuel cell activation curves and explain the characteristics of the curve
- Identify methods of reducing activation overpotential

This eLearning course is included in the Foundations of Electrochemical Engineering eLearning series.

Distribution Methods of Hydrogen
[HYD-DIS-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1 hr

This eLearning course explores the intricacies of transporting hydrogen over land, by pipeline, or ship. We examine gaseous hydrogen trailers, trucks and buses, pipelines, liquid hydrogen carriers, and ammonia as an alternative. It discusses fuel cells, which are pivotal in clean energy production. Our focus is on understanding the various types of fuel cells and their unique characteristics.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Identify the various methods of hydrogen distribution
- Describe the advantages and disadvantages of each method of distribution
- Explain the benefits and limitations of hydrogen blending into natural gas networks
- Describe the inputs and outputs to/from fuel cells
- Explain the principles of fuel cells
  Explain how a fuel cell works

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Electrochemical Cells
[HYD-GAL-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course lays the foundations for a greater understanding of electrochemical cells and the scope for future learning and problem-solving in the energy transition, where energy storage will play a more significant role.

Designed for

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

You will learn how to

- Describe the galvanic cell
- Define battery efficiency and capacity
- Outline the factors influencing battery performance
- Identify the various types of galvanic cells
- Outline the difference between primary and secondary cells
- Define the uses and advantages of Lithium batteries
- Explain the principle and characteristics of the fuel cell and the main types
- Identify the temperature ranges suited to the different types of fuel cells
- Explain the principle and characteristics of the water electrolyzer and the main types

This eLearning course is included in the Foundations of Electrochemical Engineering eLearning series.

Electrochemical Processes [HYD-ELP-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course lays the foundations for a greater understanding of electrochemical processes and the scope for future learning and problem-solving in the energy transition.

Designed for

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

You will learn how to

- Identify the processes occurring within cells
- Describe electrode reactions and electron transfer
- Outline mass transport processes
- Identify the techniques used to characterize cells and electrodes
- Outline the applicability of the electrochemical techniques
- Describe the type of information provided by using these techniques

This eLearning course is included in the Foundations of Electrochemical Engineering eLearning series.

High Temperature Fuel Cells and Electrolyzers [HYD-HTF-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course lays the foundations for a greater understanding of high-temperature fuel cells and electrolyzers, which will be essential for future learning and problem-solving in the energy transition.

Designed for

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

You will learn how to

- Describe molten carbonate fuel cells (MCFCs)
- Explain the characteristics and applications of MCFC fuel cells
- Identify the advantages and disadvantages of MCFC fuel cells
- Describe solid oxide fuel cells (SOFCs) and electrolyzers
- Explain the characteristics and applications of SOFC fuel cells and electrolyzers
- Identify the advantages and disadvantages of SOFC fuel cells and electrolyzers
- Define why Balance of Plant is required for MCFC and SOFC systems
- Identify typical BOP systems and components
- Outline key performance indicators for energy storage systems

This eLearning course is included in the Foundations of Electrochemical Engineering eLearning series.

Hydrogen Compression and Storage [HYD-COS-1-N]

STATUS		DURATION
Released	Basic (Level 1)	2 hrs

In this eLearning course, we focus on the critical aspect of hydrogen compression and storage. We will explore the various methods used to compress hydrogen as well as the means for hydrogen storage.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Recognize the basic principles of compression
- Recognize the key methods of hydrogen compression
- Identify the key attributes and functions of each type of hydrogen compressor
- Explain the need for hydrogen storage
- Identify the various methods of hydrogen storage
  Determine the factors influencing the type of hydrogen storage required

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Hydrogen Overview
[HYD-HOV-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

Hydrogen, abundant and versatile, is a colorless, odorless gas with highly reactive properties. Its main uses include petroleum refining, ammonia production, and emerging roles in fuel cells for transportation and power generation. Discovered in the 18th century, hydrogen's development has led to various industrial applications. In the future, it holds promise for decarbonizing industries such as steel and cement production and for integrating renewable energy sources into the grid through energy storage solutions. This course provides an overview of hydrogen.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Determine the key properties and characteristics of hydrogen
- Indicate the main uses for hydrogen currently
- Explain the history of how hydrogen was discovered and developed for use over time
- Identify some of the areas where hydrogen may provide opportunities to decarbonize the industry sector

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Hydrogen Process Safety
[HYD-HPS-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

This eLearning course delves into the critical field of hydrogen process safety. This eLearning course discusses the essential principles of process safety, hazard identification, risk assessment, and mitigation strategies specific to hydrogen processes. It examines safety barriers, emergency response plans, and the importance of safety culture. The eLearning course describes process safety (focused on preventing catastrophic incidents) and occupational safety (concerned with individual well-being). It explores how these two aspects intersect and complement each other in a safe working environment. Throughout this eLearning course, case studies will highlight lessons learned and underscore the need for robust safety protocols.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Define process safety
- Differentiate between occupational safety and process safety
- Identify the key design steps for process safety
- Outline the key hydrogen properties that impact process safety considerations
- Describe the types of hydrogen hazards in a hydrogen facility
- Identify the typical process safety systems and components in a hydrogen facility
- Describe elements required to manage process safety in a hydrogen facility
- Outline the factors associated with process safety training in a hydrogen facility
- Identify examples of the hydrogen process safety incidents and consequences

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Hydrogen Production
[HYD-PRO-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	3 hrs

In this course, we introduce the essential methods of hydrogen production. We explore various techniques, including steam methane reforming (SMR) and electrolysis. Understanding the principles behind hydrogen generation is crucial for sustainable energy solutions.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Identify the current production methods of hydrogen
- Indicate the carbon intensity of the different methods of production
- Outline the main advantages and disadvantages of the various methods of hydrogen production
- Describe the basic process of producing hydrogen using Steam Methane Reforming (SMR)
- Identify the key inputs and reactions in the SMR process
- Outline the key advantages and disadvantages of using SMR to produce hydrogen
- Identify the main types of hydrogen electrolysis
- Identify the main inputs and outputs of electrolysis
- Describe the pros and cons of PEM and AWL electrolysis
- Identify other methods of hydrogen production
- Explain some of the key benefits and drawbacks of these methods
- Identify which have the potential in the future to be a cost-effective and environmentally friendly hydrogen production process

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Hydrogen Use Cases and Derivatives
[HYD-HUC-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course will help you understand how we currently use hydrogen and its derivatives and the potential future use cases across the various sectors.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Define the traditional uses of hydrogen
- Specify the largest users of hydrogen currently
- Outline the opportunities for hydrogen to decarbonize various industries
- Outline the principles, inputs, and outputs of a hydrogen fuel cell
- Identify uses of hydrogen in the transportation sector
- Specify how hydrogen may be used in the power industry
- Identify the industrial sectors and specific hydrogen use cases
- Describe the high-carbon emission industries requiring decarbonizing solutions
- Outline the hydrogen derivatives and specific use cases

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Low Temperature Fuel Cells and Electrolyzers
[HYD-LTF-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course lays the foundations for a greater understanding of low-temperature fuel cells and electrolyzers, which will be essential for future learning and problem-solving in the energy transition.

Designed for

Process engineers, non-electrical engineers, technical subject matter experts, and technical managers interested in electrochemical engineering, electrolyzers, and fuel cells.

You will learn how to

- Outline the structure and components of alkaline fuel cells and electrolyzers
- Identify the operational principles and functionality of alkaline fuel cells and electrolyzers
- Explain the characteristics and applications of alkaline fuel cells and electrolyzers
- Outline the structure and components of PEM fuel cells and electrolyzers
- Identify the operational principles and functionality of PEM fuel cells and electrolyzers
- Explain the characteristics and applications of PEM fuel cells and electrolyzers
- Outline the structure and components of Phosphoric Acid Fuel Cells (PAFCs)
- Identify the operational principles and functionality of PAFCs
- Explain the characteristics and applications of alkaline PAFCs
- Identify electrochemical energy storage systems and characteristics

This eLearning course is included in the Foundations of Electrochemical Engineering eLearning series.

Safety Aspects of Hydrogen
[HYD-SAF-1-N]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2.5 hrs

Hydrogen, highly flammable and reactive, poses risks, including fire, explosion, and asphyxiation due to its ability to displace oxygen. Hazard controls include ventilation, leak detection, and specialized equipment. Emergency response protocols are crucial for incidents involving evacuation and containment. Risks involve ignition, asphyxiation, and material embrittlement, which weakens metal structures over time. Consequences range from property damage to injury or loss of life. This course describes hazards, risks, and hazard controls for hydrogen and discusses hydrogen incidents and emergency responses.

Designed for

Anyone interested in an awareness of what hydrogen is and how it can be used in various industries to assist in the energy transition to a lower carbon-emitting future.

You will learn how to

- Describe hydrogen risks and associated risks
- Describe the potential consequences of hydrogen risks
- Explain material embrittlement

This eLearning course is included in the Introduction to Hydrogen eLearning series.

Energy Storage
[EST-ESC-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course covers the following topics:

- Battery storage
- Thermal energy storage
- Compressed and liquid air storage
- Pumped hydro-power storage
- Gravity storage

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Identify the various methods of energy storage for peak saving and capacity optimization
- Describe electric battery energy storage
- Describe grid storage considerations
- Describe liquid air energy storage
- Discuss compressed air energy storage
- Describe pumped power energy storage
- Describe gravity energy storage

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Solar Power Generation
[SOL-SPG-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	1.5 hrs

This eLearning course covers the following topics:

- Concentrated solar energy
- Concentrated tower
- Parabolic trough
- Stirling engine
- Photovoltaics

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Understand the application and development of solar thermal power plants
- Understand the development of Photovoltaic (PV) technology over time
  Be able to discuss the practical usage of solar power technologies in industrial and domestic application

This eLearning course is included in the Overview of Net-Zero and Renewables eLearning series.

Wind Power Generation
[WND-WPG-1-R]

STATUS	LEVEL	DURATION
Released	Basic (Level 1)	2 hrs

This eLearning course covers the following topics:

- Horizontal and vertical axis wind turbines
- Siting
- Sizing

Designed for

This course is useful for senior and middle management, and anyone involved in integrating low-carbon power generation technologies into existing and future infrastructure.

You will learn how to

- Be able to discuss the design and application of HAWT and VAWT wind turbines
- Calculate required wind turbine capacity based on power needed
- Calculate power available from the wind
- Choose appropriate sites for wind turbine installations
- Identify the key differences between onshore and offshore wind turbine installations

This eLearning course is included in the Overview of Net-Zero and Renewables 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 skills 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 skills 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 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

- 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 CO_2 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 skills 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 skills 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 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

- 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 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

- 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 skills 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 skills 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 an 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 skills 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 handling 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 various possible outcomes.

Designed for

Managers, engineers, explorationists, field accounting supervisors, and other personnel who need to develop or improve their skills and understanding of basic economic analysis and the 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 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

- 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 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

- 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.