## Facilities Course Progression Map

### Basic
- Overview of Gas Processing – G2
- Introduction to Oil and Gas Production Facilities – PF2

### Foundation
- Oil Well Pad Facilities (For Facilities Engineers) – OWPF-FE
- Applied Water Technology in Oil and Gas Production – PF21
- Fundamental and Practical Aspects of Produced Water Treating – PF23
- Process Safety Engineering – PS4
- Risk Based Process Safety Management – HS45
- Fundamentals of Process Safety – PS2
- Electrical Engineering Fundamentals for Facilities Engineers – E3
- Instrumentation and Controls Fundamentals for Facilities Engineers – IC3
- Instrumentation, Controls and Electrical Systems for Facilities Engineers – ICE21
- Offshore Pipeline Design and Construction – PL43
- Corrosion Management in Production/Processing Operations – PF42

### Intermediate
- Gas Treating and Sulfur Recovery – G6
- Practical Computer Simulation Applications in Gas Processing – G5
- Onshore Gas Gathering Systems: Design & Operation – PF45
- Separation Equipment - Selection & Sizing – PF42
- Relief and Flare Systems – PF44
- Flow Assurance for Offshore Production – FAOP
- Valve and Actuator Technologies – IC72
- PLC and SCADA Technologies – IC71

### Specialized
- CO₂ Surface Facilities – PF81
- Troubleshooting Oil and Gas Processing Facilities – PF49
- Oil and Gas Processing Facilities – PF4
- Gas Conditioning and Processing Principles – G3 Virtual/Blended Course
- Gas Conditioning and Processing - LNG Emphasis – G4LNG
- Gas Conditioning and Processing – G4

### Offshore & Subsea
- Overview of Offshore Systems – OS21
- Terminals and Storage Facilities – PL44
- Offshore Pipeline Design and Construction – PL42

### Pipeline Engineering
- Pipeline Facilities: Design, Construction and Operations – PL42

### Process Safety
- Risk Based Process Safety Management – HS45
- Process Safety Engineering – PS4
- Process Safety Engineering Principles – PSE Virtual/Blended Course

### Instrumentation, Controls & Electrical
- Electrical Engineering Fundamentals for Facilities Engineers – E3
- Instrumentation and Controls Fundamentals for Facilities Engineers – IC3
- Instrumentation, Controls and Electrical Systems for Facilities Engineers – ICE21

### Oil and Gas Processing
- Gas Conditioning and Processing Principles – G3 Virtual/Blended Course
- Oil Production and Processing Facilities – PF4
- Gas Conditioning and Processing - LNG Emphasis – G4LNG
- Gas Conditioning and Processing – G4

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**Facilities Course Progression Map**

**Oil and Gas Processing**
- Gas
- Oil / Water
- General Processing

**Process Safety**
- Electrical
- Instrumentation & Controls

**Instrumentation, Controls & Electrical**
- Electrical
- Instrumentation & Controls

**Offshore & Subsea**
- Practical PID Control and Loop Tuning – IC74
- Flow and Level Custody Measurement – IC73

**Pipeline Engineering**
- Flow Assurance for Offshore Production – FAOP
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<td>Maintenance Planning and Work Control – OM41</td>
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Operations
Midstream
specif into skill fundamentals extends technical
• Tower Fouling and
• Pipeline Fundamentals
• Storage Tanks
Topics include:
• Stabilization System
• Process
• Operations and asset integrity
• Facilities sites and design concerns • Design and construction considerations for risers and
• Specialized equipment and materials for
• Review pipeline hydraulics, focusing on those
• Overview of oil and gas transportation systems •
• Identify offshore safety and environmental
• Identify the principal interfaces of pipeline
• Identify special design and construction
• Overview of underground cavern storage facilities (salt and rock caverns) and appropriate
• Specialized equipment and materials for
• Special design and construction considerations for risers and umbilicals, foreign pipeline crossings, single
• Key factors affecting safety, product quality, system reliability, and profitability in design, construction, and operations • Atmosphere storage tank design, layout, construction, corrosion prevention, and operations covering API 650 and API 653 • Overview of pressure vessel and sphere design and construction • Design, development, and operation of underground cavern storage facilities

You will learn how to
• Apply regulatory codes, standards, and industry guidelines (API and others) that control and guide the permitting, design, construction, operation, and maintenance of pipelines
• Apply mechanical and physical principles to pipeline design, hydraulics, and material selection
• Apply mechanical and physical principles to pump and compressor selection
• Describe the important factors in station design
• Describe the importance of route selection and hydraulics for long term profitability, reliability, and safety
• Identify special design and construction challenges of onshore pipeline systems
• Describe methods of river and road crossings, HDD crossings, bores
• Identify the principle interfaces and potential interconnections of pipeline facilities, such as pump stations and terminals, on design and operations
• Apply operational and maintenance tools and procedures, including system monitoring and control, leak detection, corrosion control, custody measurement and quality control, asset integrity management, and emergency response planning

Course content
Regulations and code compliance requirements • Pipeline survey and routing • Mechanical and hydraulic design • Proper system sizing and design • Equipment selection criteria • Facilities sites and design concerns • Construction methods and contracting approaches • Operations and asset integrity management

2019 Schedule and Tuition (USD)
DUBAI, UAE 15-19 SEP $5445+VAT
HOUSTON, US 6-10 MAY $4325
KUALA LUMPUR, MYS 25-29 NOV $5460

2019 Schedule and Tuition (USD)
DUBAI, UAE 22-26 SEP $5445+VAT
HOUSTON, US 26-30 AUG $4325

2019 Schedule and Tuition (USD)
DUBAI, UAE 15-19 SEP $5445+VAT
HOUSTON, US 6-10 MAY $4325
KUALA LUMPUR, MYS 25-29 NOV $5460

This intensive five-day foundation level course covers the principal aspects of design, construction, and operations of offshore pipeline systems. The course focuses on pipeline mechanical, strength, and stability design, and construction. Special challenges, such as shoreline crossings, foreign pipeline crossings, repair methods, flow assurance, corrosion control and cathodic protection are an integral part of this course. Participants will acquire the essential knowledge and skills to design, construct, and operate pipelines. Design problems and team projects are part of this course.

Designed for Engineers, designers and operators who are actively involved in the design, specification, construction, and operation of offshore pipeline systems.

You will learn how to
• Apply mechanical, structural, and physical principles to offshore pipeline design, material selection, construction, and operation
• Describe the key construction methods
• Define the importance of environmental conditions, construction methods, and pipeline system hydraulics in design, installation, and operations of offshore pipeline systems
• Identify special design and construction challenges of offshore pipeline systems
• Incorporate construction methods into the design of a pipeline system
• Identify the principal interfaces of pipeline facilities, such as platforms, floating production systems, sub-sea wellheads, and SPMs on design, construction, and operations of offshore pipeline systems
• Identify offshore safety and environmental practices and their effect on design, construction, and operations

Course content
Overview of oil and gas transportation systems • Review pipeline hydraulics, focusing on those aspects that affect design, construction, and operations • Pipeline systems definition, survey, and route selection • Safety, environmental, and regulatory considerations, focusing on Codes and Standards related to pipelines • Pipeline conceptual and mechanical design for strength, stability, and constructability • Pipeline materials and components selection including line pipe, corrosion and cathodic protection, and coatings • Specialized equipment and materials for integrating with subsea wellhead/manifold systems, side taps, insulation, and pipe-in-pipe will be reviewed • Special design and construction considerations for risers and umbilicals, foreign pipeline crossings, single point mooring and shore approaches • Introduction to flow assurance considerations and pipeline integrity aspects including in-line inspection, leak detection and emergency planning considerations • Pipeline operations, maintenance and repair considerations and their impact on design and material selection

Designed for Pipeline project managers and engineers, operations and maintenance supervisors, regulatory compliance personnel, and other technical professionals with 1-3 years of experience in natural gas, crude oil, refined petroleum products, LPGs, NGL, chemical, carbon dioxide pipeline engineering, construction, operations, or maintenance. This course is intended for participants needing a broad understanding of the planning, development, construction, start-up, and operating and asset integrity management of onshore pipelines.

You will learn how to
• Apply regulatory codes, standards, and industry guidelines (API and others) that control and guide the permitting, design, construction, operation, and maintenance of pipeline facilities
• Apply mechanical and physical principles to pipeline design, hydraulics, and material selection
• Apply mechanical and physical principles to pump and compressor selection
• Describe the important factors in station design
• Describe the importance of route selection and hydraulics for long term profitability, reliability, and safety
• Identify special design and construction challenges of onshore pipeline systems
• Describe methods of river and road crossings, HDD crossings, bores
• Identify the principle interfaces and potential interconnections of pipeline facilities, such as pump stations and terminals, on design and operations
• Apply operational and maintenance tools and procedures, including system monitoring and control, leak detection, corrosion control, custody measurement and quality control, asset integrity management, and emergency response planning

Course content
Regulations and code compliance requirements • Pipeline survey and routing • Mechanical and hydraulic design • Proper system sizing and design • Equipment selection criteria • Facilities sites and design concerns • Construction methods and contracting approaches • Operations and asset integrity management

2019 Schedule and Tuition (USD)
DUBAI, UAE 15-19 SEP $5445+VAT
HOUSTON, US 6-10 MAY $4325
KUALA LUMPUR, MYS 25-29 NOV $5460

This 5-day, foundation level course reviews key issues associated with development, design, construction, and operation of terminals and storage facilities for liquid hydrocarbons and NGLs. The course covers the principal aspects of design, construction, and operations of storage facilities for hydrocarbon liquids, NGLs, and petrochemical feedstocks. This course is for participants needing a foundation level understanding of the planning, engineering, construction, operations, and maintenance of storage facilities and terminals connected to pipelines, rail, barges/tankers and/or truck loading facilities.

You will learn
• Storage and terminals basics for hydrocarbon liquids, NGLs, and petrochemical feedstocks
• Design and operation of atmospheric storage tanks and pressurized bullets and spheres
• Fundamentals of underground storage (salt and rock caverns)
• Safety, product quality, and availability concerns

Course content
Sizing criteria and economics for storage and terminal facilities • Various storage types (atmospheric storage tanks, pressure vessels, salt or rock caverns) and appropriate applications • Terminal and tank farm layout constraints • Details of industry codes and standards, plus regulatory and environmental compliance • Selection of equipment for delivery and receipt to/from pipelines, barges and ships, and trucks, including metering options, loading arms, pumps, and control systems • Blending options and equipment, VRU/VOC, water treating, and fire protection • Key factors affecting safety, product quality, system reliability, and profitability in design, construction, and operations • Atmospheric storage tank design, layout, construction, corrosion prevention, and operations covering API 650 and API 653 • Overview of pressure vessel and sphere design and construction • Design, development, and operation of underground cavern storage facilities

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Oil Production and Processing Facilities – PF4

FOUNDATION 10-DAY

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

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

YOU WILL LEARN
• Well inflow performance and its impact on production/processing facilities
• About oil, gas, and water compositions and properties needed for equipment selection and sizing
• How to select and evaluate processes and equipment used to meet sales or disposal specifications
• To apply physical and thermodynamic property correlations and principles to the design and evaluation of oil production and processing facilities
• How to perform equipment sizing calculations for major production facility separation equipment
• To evaluate processing configurations for different applications
• How to recognize and develop solutions to operating problems in oil/water processing facilities

COURSE CONTENT
• Reservoir traps, rocks, and drive mechanisms
• Phase envelopes and reservoir fluid classification
• Well inflow performance
• Artificial lift
• Gas, oil, and water - composition and properties
• Oil gathering systems
• Gas-liquid separation
• Emulsions
• Oil-water separation
• Oil treating
• Desalting
• Oil stabilization and sweetening
• Oil storage and vapor recovery
• Sand, wax, asphaltenes, and scale
• Transportation of crude oil
• Produced water treatment
• Water injection systems
• Solution gas handling

2019 Schedule and Tuition (USD)

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Gas Conditioning and Processing – G4
The Campbell Gas Course®

FOUNDATION 10-Day

The Campbell Gas Course® has been the standard of the industry for more than 52 years. Tens of thousands of engineers have attended our G4 program, considered by many to be the most practical and comprehensive course in the oil and gas industry.

Both hands-on methods and computer-aided analysis are used to examine sensitivities of technical decisions. To enhance the learning process, about 30 problems will be assigned, reviewed, and discussed throughout the course. Problems will be solved individually and in teams.

YOU WILL LEARN HOW TO
• Application of gas engineering and technology in facilities and gas plants
• Important specifications for gas, NGL, and condensate
• About the selection and evaluation of processes used to dehydrate natural gas, meet hydrocarbon dewpoint specifications, and extract NGLs
• How to apply physical/thermodynamic property correlations and principles to the operation, design, and evaluation of gas processing facilities
• Practical equipment sizing methods for major process equipment
• To evaluate technical validity of discussions related to gas processing
• To recognize and develop solutions for operating problem examples and control issues in gas processing facilities

COURSE CONTENT
• Gas processing systems
• Physical properties of hydrocarbons
• Terminology and nomenclature
• Qualitative phase behavior
• Vapor-liquid equilibrium
• Water- hydrocarbon phase behavior, hydrates, etc.
• Basic thermodynamics and application of energy balances
• Process control and instrumentation
• Relief and flare systems
• Fluid hydraulics: two-phase flow
• Separation equipment
• Heat transfer equipment
• Pumps
• Compressors and drivers
• Refrigeration in gas conditioning and NGL extraction facilities
• Fractionation
• Glycol dehydration; TEG
• Adsorption dehydration and hydrocarbon removal
• Gas treating and sulfur recovery
• Overview and summary

2019 Schedule and Tuition (USD)

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Self-paced, virtual course - start anytime.
Tuition US$4325

Risk Based Process Safety Management – HS45

FOUNDATION 5-DAY

This course introduces process safety management in the oil and gas industry, the elements and benefits of process safety management systems, and tools for implementing and managing a system. In this course the participant will learn to use tools and techniques for managing process safety. The Center for Chemical Process Safety’s (CCPS) book titled “Guidelines for Risk Based Process Safety or “RBPS Guidelines” will be the text for this course. Participant centered exercises and selected case studies will be used to build on the concepts that CCPS advocates for risk based process safety.

Throughout the course, participants will be challenged to think how their process safety management system can be enhanced and modified to meet the concepts of risk-based decision making. An individual action plan will be developed to apply the information from the course to the workplace.

YOU WILL LEARN HOW TO
• Identify processes applicable to Process Safety Management (PSM) and describe relevant terms used
• Identify which standards are to be applied for managing process hazards
• Apply programs and tools for managing a PSM system
• Choose appropriate decision making methods and tools to identify process hazards
• Describe and use techniques available for control of hazards associated with process designs
• Describe the criteria and methods of selecting equipment and safe guarding controls
• Research and apply the performance parameters for the safety systems in operations
• Explain the role of all disciplines and their contribution to the management of potential HSE hazards

COURSE CONTENT
Process safety culture and competency • Compliance with standards • Understand hazards and risk • Operating procedures and safe work practices • Asset integrity and reliability • Management of change • Conduct of operations • Incident investigation (associated with plant failures) • Measurement and metrics • Management review and continuous improvement

2019 Schedule and Tuition (USD)

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Fundamentals of Offshore Systems and Construction – OS4

This 10-day course provides a fundamental understanding of the technology and work processes used for the design and construction of all types of offshore systems, including consideration of asset development, surveillance, and management. The content includes the full range of water depths from shallow water to ultra-deepwater and will also address life-cycle considerations in all phases of offshore field development and operation. All major components required for offshore developments, such as fixed and floating platforms, drilling rigs, workover equipment, pipelines, risers, process, and utilities and construction equipment are discussed. Emphasis is placed on the multi-discipline team approach needed to manage the myriad interfaces of offshore facility design, construction, and operations. Individual and group exercises are used throughout the course. A case study for an offshore project development is included.

**YOU WILL LEARN**

- Identifying the key facilities parameters that must be evaluated for field development
- Recognizing the best applications and characteristics of each type of offshore fixed and floating structure
- Account for the effects of the ocean environment on facilities design, construction, and operations
- Identify the impact space, loads and forces have on the structural design and global performance of offshore structures and how they influence their cost
- Describe the impact topside facilities (drilling, well servicing, processing, and utilities) affect the structural design and how the topside design process is done
- Recognize and manage key design and operational interfaces between the major components of offshore facilities systems
- Understand the key design, construction, and installation issues associated with fixed and floating platforms and how to apply the lessons learned to your work

**COURSE CONTENT**

- Offshore systems overview and field architecture selection
- Well construction and servicing equipment and operation
- Flow assurance
- Topsides facilities
- Oil and gas transportation facilities
- Process systems
- Subsea systems
- Production operations
- Infrastructure impact on design and operations
- Effects of the ocean environment
- Introduction to naval architecture
- Structural design processes and tools
- Construction plans and execution

**2019 Schedule and Tuition (USD)**

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<th>Location</th>
<th>Date</th>
<th>Price</th>
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<tbody>
<tr>
<td>HOUSTON, US</td>
<td>22-26 JULY</td>
<td>$4425</td>
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<tr>
<td>KUALA LUMPUR, MYS</td>
<td>21-25 OCT</td>
<td>$5560</td>
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<td>LONDON, UK</td>
<td>29-30 AUG</td>
<td>$5135+VAT</td>
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<tr>
<td>SINGAPORE</td>
<td>20-21 AUG</td>
<td>$4370</td>
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**Technical Resources Available to You**

- Sign up to receive valuable content
- Invitations for PetroSkills events and conferences
- Complimentary learning and development resources
- Information on new courses and instructors
- Additional public course locations and dates
- You Will Receive:
TO VIEW OUR COURSES IN OTHER DISCIPLINES, VISIT:

**Subsurface**
- Introductory and Multi-Discipline
- Geology
- Geophysics
- Petrophysics
- Reservoir Engineering
- Well Construction/Drilling
- Production and Completions Engineering
- Unconventional Resources
- Integrated - Heavy Oil
- Petroleum Data Management

**Facilities**
- Gas Processing
- Process Facilities
- Offshore & Subsea
- Instrumentation, Controls & Electrical
- Mechanical Engineering
- Reliability Engineering
- Procurement/Supply Chain Management
- Refining

**Operations & Maintenance**

**Health, Safety, Environment**

**Petroleum Business and Professional Development**
- Petroleum Professional Development
- Petroleum Business
- Project Management

SIGN UP FOR PETROSKILLS EMAILS
PetroSkills Blended Learning Skill Modules™ combine industry knowledge, expertise, content, and technology to develop workforce competency with the added benefit of:

- **Reduced time to competency**
- **Eliminated travel expense**
- **Flexibility—less time away from work**
- **Learning applied at point of need**

Courses Available Now:
- Applied Reservoir Engineering
- Basic Drilling, Completion, and Workover Operations
- Basic Geophysics
- Basic Petroleum Technology Principles
- Basic Reservoir Engineering
- Basics of Rotating Mechanical Equipment
- Basics of Static Mechanical Equipment
- Casing Design Workshop
- Completions and Workovers
- Foundations of Petrophysics
- Gas Conditioning and Processing Principles
- NODAL Analysis Workshop
- Process Safety Engineering
- Production Operations 1
- Production Technology for Other Disciplines
- Scale Identification, Remediation and Prevention Workshop

**Coming Soon:** Production Logging, Pipeline, Drilling Principles, Geomechanics, Petroleum Geology, and ICE.

For more information, please visit petroskills.com/blended