



**CPE Academy.**

**CAMEROON PETROCHEMICAL ENGINEERING ACADEMY**

**Professional Training on Petroleum, Oil & Gas**

**Technological Operations.**

**SHORT TERM TRAINING COURSES Offered.**

SN	COURSE DESCRIPTION	TRAINING DURATION
1	<p><b>Roughneck</b></p> <ol style="list-style-type: none"> <li>1) IADC Rig PASS</li> <li>2) Drilling calculation and Rig Mathematics</li> <li>3) Safety Drilling Operation</li> <li>4) Drilling practices/ Equipment</li> <li>5) Rig Maintenance (Electrical)</li> <li>6) Rig Maintenance (Mechanical)</li> <li>7) Rig Inspection</li> <li>8) Rig Testing/ Acceptance</li> <li>9) Rig English</li> </ol>	30 Days
2	<p><b>Reservoir Engineering</b></p> <ol style="list-style-type: none"> <li>1) Basic reservoir engineering</li> <li>2) Basic well test design and analysis</li> <li>3) Reservoir fluid properties and EOS</li> <li>4) Water flood design, management and monitoring</li> <li>5) Advance reservoir engineering</li> <li>6) Applied reservoir simulation</li> <li>7) Gas reservoir engineering</li> <li>8) Reserve management and evaluation</li> <li>9) Advance reservoir simulation practices</li> <li>10) Integrated pressure and production data analysis</li> </ol>	30 Days
3	<p><b>Petro physics</b></p> <ol style="list-style-type: none"> <li>1) Basic open hole logging and formation evaluation</li> <li>2) Applied core analysis</li> <li>3) Advance formation evaluation</li> <li>4) Dip water and borehole image logging</li> <li>5) NMR for petro-physics application</li> <li>6) Principles and application of well logging</li> <li>7) Advances in open hole logging practices.</li> </ol>	30 Days
4	<p><b>Petroleum Geophysics</b></p> <ol style="list-style-type: none"> <li>1) Borehole seismic VSP application</li> <li>2) Seismic attributes and AVO analysis</li> <li>3) Basic seismic exploration</li> <li>4) Seismic data interpretation</li> <li>5) Integration of well logs and seismic data</li> </ol>	30 Days

	<ul style="list-style-type: none"> <li>6) Practical seismic data processing</li> <li>7) Advance in seismic interpretation for 3D reservoir modeling</li> <li>8) Applied geophysical exploration practices</li> <li>9) Advance seismic acquisition systems.</li> </ul>	
5	<p><b>Gas Compression and Transportation</b></p> <ul style="list-style-type: none"> <li>1) Natural gas systems</li> <li>2) Characteristics of gases</li> <li>3) Laws affecting gas behavior</li> <li>4) Gas handling in compression plants</li> <li>5) Factors affecting the compression system: Gas conditioning</li> <li>6) Gas compression systems: Principles, compressor types, and operating curves</li> <li>7) Compressor selection, control, and operations</li> <li>8) Other equipment: Drivers, gas turbines, combustion chambers and other drivers</li> <li>9) Compression system simulation: Objectives for design, selection, and operation; equations of state and their applications</li> <li>10) Estimation of thermodynamic properties</li> <li>11) Flow diagram for preparation of compression stages</li> <li>12) Simulation of pipelines and compressors</li> <li>13) Behavior of hydrocarbon, water, and dehydrated gas</li> <li>14) Natural gas transport</li> <li>15) Criteria for handling of natural gas</li> </ul>	30 Days
6	<p><b>Offshore Facilities</b></p> <ul style="list-style-type: none"> <li>1) Classification of offshore facilities according to depth</li> <li>2) Shallow-water production facilities</li> <li>3) Deepwater facilities</li> <li>4) Fixed platforms</li> <li>5) Floating production systems</li> <li>6) Subsea systems: Technological development and trends</li> <li>7) Structural considerations in offshore facilities</li> <li>8) Environmental, geographical, and soil considerations</li> <li>9) Layouts of offshore facilities</li> <li>10) Evolution of the Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms (API RP 2A)</li> <li>11) Offshore facilities construction engineering</li> <li>12) Subsea production system</li> <li>13) Digital oilfield production monitoring, control, and optimization technologies</li> </ul>	30 Days

7	<p><b>Introduction to Surface Facilities</b></p> <ol style="list-style-type: none"> <li>1) Field development overview</li> <li>2) Well flow control and safety system</li> <li>3) Gathering system</li> <li>4) Fluid separation system</li> <li>5) Oil treatment</li> <li>6) Water treatment</li> <li>7) Gas treatment</li> <li>8) Flow assurance overview</li> <li>9) Custody transfer and measurements</li> <li>10) Process equipment</li> </ol>	30 Days
8	<p><b>Emergency Systems and Electrical Components and Equipment</b></p> <ol style="list-style-type: none"> <li>1) Emergency power systems</li> <li>2) Emergency power requirements</li> <li>3) Design of emergency power systems</li> <li>4) Principles and designs of main and emergency systems</li> <li>5) Emergency power system components</li> <li>6) Power generation and distribution</li> <li>7) Emergency generators: Rotating equipment</li> <li>8) Diesel engines and Turbines and Alternators</li> <li>9) Cogeneration principles and Steam turbines</li> <li>10) Uninterrupted power supplies (UPS)</li> <li>11) Principles of UPS maintenance</li> </ol>	30 Days
9	<p><b>Crude Oil Pumps and Gas Compression Systems</b></p> <ol style="list-style-type: none"> <li>1) Fundamentals of oil and gas behaviors</li> <li>2) Chemistry of oil and gas</li> <li>3) Pumping systems at production facilities</li> <li>4) Types and applications of pumping systems</li> <li>5) Pumping stations and booster stations</li> <li>6) Pump selection, application, and performance evaluation</li> <li>7) Pump installation, operation, and maintenance design considerations</li> <li>8) Gas compression systems at production facilities</li> <li>9) Gas compression systems and equipment</li> <li>10) Thermodynamics of compression</li> <li>11) Types and applications of compressors</li> <li>12) Selection criteria for dynamic and positive displacement compressors</li> <li>13) Compressor thermodynamics and operating characteristics</li> </ol>	30 Days

	<p>14) Compressor installation, operation, and maintenance design considerations</p> <p>15) Gas transportation systems (codes and considerations)</p> <p>16) Safety, environmental, and regulatory considerations; standards related to gas handling and transportation</p>	
10	<p><b>Crude Oil and Water Treatment</b></p> <ol style="list-style-type: none"> <li>1) Oil treatment fundamentals: Crude oil specifications, dehydration, desalting, water solubility, viscosity, theoretical and actual case applications, Stoke's law, variables affecting crude oil dehydration, and demulsifier requirements and selection</li> <li>2) Emulsion theory</li> <li>3) Crude oil dehydration equipment: Type, design, and operation criteria; dehydration performance, and</li> <li>4) technology selection</li> <li>5) Crude oil desalting: Principles, equipment, technology, design considerations, and selecting systems</li> <li>6) based on cost and longevity</li> <li>7) Water treatment: Specifications, properties of produced water, environmental regulations, design of treatment process and equipment, enhanced gravity, chemical treatment, technology analysis and selection</li> </ol>	30 Days
11	<p><b>Gas Processing and Conditioning</b></p> <ol style="list-style-type: none"> <li>1) Natural gas properties and behavior</li> <li>2) Water-hydrocarbon behavior and the effect of contaminants (H<sub>2</sub>S, CO<sub>2</sub>)</li> <li>3) Hydrates: The problem, deposition site, impact, composition and structure, conditions of formation;</li> <li>4) hydrate detection, control, and remediation</li> <li>5) Gas separation: Principle, types, multistage process, condensate stabilization, and two- and threephase separators</li> <li>6) Gas sweetening: Processes, designs, and operating aspects</li> <li>7) Gas dehydration: Processes, dehydration, theoretical discussion and principles, application to actual cases, key operating parameters, most common operational problems and possible solutions</li> <li>8) Gas measurements and Gas transportation system</li> <li>9) New developments and emerging technologies and Commercial issues</li> <li>10) Technological challenges for natural gas production</li> </ol>	30 Days

12	<p><b>Gas Conditioning and Handling</b></p> <ol style="list-style-type: none"> <li>1) Natural gas: Value chain, characteristics, quality, and specifications</li> <li>2) Production fluids separation: Two and three phases, horizontal and vertical, design criteria, operational condition and criteria</li> <li>3) Gas sweetening: Processes, advantages and disadvantages, design and operation criteria, typical operating problems, and troubleshooting</li> <li>4) Gas dehydration: Processes, advantages and disadvantages, selection criteria, design and operation criteria, typical operating problems, and troubleshooting</li> <li>5) Liquid removal and Gas transportation</li> <li>6) Process equipment: Compressor design and operation criteria; and heat exchanger types, design and operation criteria, and selection</li> </ol>	30 Days
13	<p><b>Hydrocarbon Properties and Behaviors Surface Facilities</b></p> <ol style="list-style-type: none"> <li>1) Flow assurance principles and fundamentals</li> <li>2) Inorganic scale: Deposition principles, prediction, modeling, management program design, and scale prevention</li> <li>3) Hydrates: Deposition principle, impact, hydrate detection, control, and remediation</li> <li>4) Paraffins (wax): Deposition principle, properties, factors affecting deposition, operational problems, control, and remediation</li> <li>5) Asphaltenes: Key properties, deposition mechanism, modeling, effect of variables, operational problems, prevention, and remediation</li> <li>6) Emulsions: Crude oil natural surfactants, characteristics, and treatments</li> <li>7) Corrosion: Factors influencing oilfield corrosion and their control</li> </ol>	30 Days
14	<p><b>Introduction to Field Development Planning</b></p> <ol style="list-style-type: none"> <li>1) Reservoir life cycle</li> <li>2) Dynamic FDPs</li> <li>3) Development scenarios and options</li> <li>4) Synchronized subsurface and surface decision making</li> <li>5) Data requirements and integration</li> <li>6) Reservoir monitoring interfaces and requirements</li> </ol>	30 Days

	<ul style="list-style-type: none"> <li>7) FDP components and tasks and Opportunity framing workflow and roadmap</li> <li>8) Building a risk register and stakeholder map</li> <li>9) Hands-on exercises building a FDP</li> <li>10) Final presentation of the constructed FDP</li> </ul>	
15	<p><b>Integrated Production System, Gathering Network, and Flow of Fluids</b></p> <ul style="list-style-type: none"> <li>1) Subsurface-surface integrated system</li> <li>2) Hydrocarbon production process</li> <li>3) Hydrocarbon properties</li> <li>4) Basics of fluid properties</li> <li>5) Thermodynamics</li> <li>6) Wellhead and wellhead equipment</li> <li>7) Flowlines and gathering network</li> <li>8) Fluid flow principles</li> <li>9) Single-phase flow</li> <li>10) Pressure drop for gas or liquid</li> <li>11) Multiphase flow principles and definitions</li> <li>12) Flow pattern correlations for horizontal pipe</li> <li>13) Use of PIPESIM* or similar software to simulate gathering network</li> </ul>	30 Days
16	<p><b>HSE in Exploration and Production</b></p> <ul style="list-style-type: none"> <li>1) Risk management: Basic definitions, occupational health plan, risk recognition, unsafe act, and risk-generating source</li> <li>2) Risk evaluation objectives and Determination of risk magnitude</li> <li>3) Relate exposure results with clinical investigation</li> <li>4) Risk-control methods and their effectiveness</li> <li>5) Sampling strategy, plan, and methods</li> <li>6) Sample analysis: Direct-measurement tools and continuous sample analysis</li> <li>7) Risk control and Administration of risks at work</li> <li>8) Accidents: Causes, results, and occupational and disease management</li> <li>9) Hazard identification: HAZOP analysis, qualitative methods for risk analysis, human error analysis, accident scenarios, natural threats, and preparation for emergencies</li> <li>10) Case identification, and evaluation and control of an emergency</li> </ul>	30 Days

17	<p><b>Maintenance Cost Control</b></p> <ol style="list-style-type: none"> <li>1) Maintenance cost causes</li> <li>2) Maintenance cost classification</li> <li>3) Reliability tools for maintenance cost control</li> <li>4) Maintenance value chain</li> <li>5) Maintenance cost control: Budget and estimations</li> <li>6) Feasibility studies and Planning tasks and their costs</li> <li>7) Activity-based costs and Real-world case studies</li> </ol>	30 Days
18	<p><b>Low-Voltage, High-Voltage, Grounding, and Testing Equipment</b></p> <ol style="list-style-type: none"> <li>1) Low- and high-voltage switchgear</li> <li>2) Electrical safety: Grounding, earthing bonding, faults</li> <li>3) Earthing system</li> <li>4) Regulations on electricity: Concept of duty holder</li> <li>5) Electrical systems, work activities, and protective equipment</li> <li>6) Strengths and capabilities of electrical equipment</li> <li>7) Electrical equipment in adverse or hazardous environments</li> <li>8) Insulation and barriers</li> <li>9) Protection from overload and short</li> <li>10) Circuit currents and Disconnection and isolation of circuits</li> <li>11) Precautions for safe isolation — working live</li> <li>12) High-voltage switchgear, operations, features</li> <li>13) Power transformer operation and Power cable and earthing system</li> <li>14) High-voltage operations and safety and licensing requirements</li> <li>15) Arrangements of systems, substations, switchrooms</li> <li>16) Testing and metering equipment</li> </ol>	30 Days
19	<p><b>Introduction to Maintenance and Reliability Multiphase Flow</b></p> <ol style="list-style-type: none"> <li>1) Single-phase fluid</li> <li>2) Pressure drop equations and correlations for single phase flow</li> <li>3) Multiphase flow</li> <li>4) Software for modeling fluid flow</li> <li>5) Operational considerations of multiphase flow</li> <li>6) Multiphase flow metering</li> </ol>	30 Days

20	<p><b>Monitoring and Reporting Systems in Production Testing</b></p> <ol style="list-style-type: none"> <li>1) Well production tests: Reasons to test, technical and operational processes</li> <li>2) Well testing process</li> <li>3) Data obtained and calculations made</li> <li>4) Determination of unsafe conditions</li> <li>5) Flow metering applications: Single phase metering and measurement standards (API, AGA, and GPA)</li> <li>6) Water content measurements</li> <li>7) Multiphase measurements: Conventional separation, gamma absorption, vibrating tube, neutron interrogation, weighing, and multiphase flow rate calculations</li> <li>8) Activities in flow station: Station type, physical condition of station and of equipment</li> <li>9) Measurement activities to acquire samples: Procedure prior to, during, and after sampling</li> </ol>	30 Days
21	<p><b>Maintenance Integrated Planning</b></p> <ol style="list-style-type: none"> <li>1) World-class maintenance</li> <li>2) Maintenance value chain and responsibilities</li> <li>3) Maintenance engineering</li> <li>4) Maintenance planning and programming execution</li> <li>5) Risk in maintenance planning</li> <li>6) Planning the control in maintenance</li> <li>7) Strategic direction of maintenance tasks</li> <li>8) Risk definition and Uncertainty quantification and propagation</li> <li>9) Generic strategy and Definition of maintenance planning</li> </ol>	30 Days
22	<p><b>Metering, Measurements, and Production Tests</b></p> <ol style="list-style-type: none"> <li>1) Flow metering principles</li> <li>2) Flow metering equipment: Orifice plates, turbine meters, ultrasonic meters, and Coriolis meters</li> <li>3) Fluid Levels: Principles, instruments, and sensors</li> <li>4) Water content measurements: Electrical parameter-based, density-based, and factors affecting measurements</li> <li>5) Multiphase measurements: Separation meters (gas and liquid), gamma absorption, vibration tube,</li> <li>6) and neutron interrogation</li> </ol>	30 Days



	<ul style="list-style-type: none"> <li>7) Well production tests: General description of well test process; pressure data; physical condition of wellhead, well instrumentation, and controls; failure reports, and equipment adjustments</li> <li>8) Measurements at flow station: Physical condition of flow station, process to pass the well for test, process to restore the well for production after test, and fluid measurements at the flow station</li> </ul>	
23	<p><b>Integration of Safety into Systems and Processes</b></p> <ul style="list-style-type: none"> <li>1) Safety fundamentals: Accidents, incidents, acts, unsafe conditions, risk, hazards, fire and flammability limits, explosions, and emergency plans</li> <li>2) Organic Law of Prevention, Work Conditions and Environment (LOPCYMAT)</li> <li>3) Industrial health: Fundamentals, ergonomics, personal protective equipment, and health based on</li> <li>4) human behavior</li> <li>5) Environmental: Fundamentals, laws and regulations, applications, handling and disposal of solids and liquids</li> <li>6) Safety in work practices: Fundamentals, standards, requirements, and applications</li> <li>7) Risk analysis in the workplace</li> <li>8) Permits for hot and cold work</li> <li>9) Blocking and de-energizing of equipment (lines and containers) Confined spaces</li> <li>10) Excavations and Equipment setup</li> <li>11) Work at elevated areas</li> <li>12) Safety procedures for the plant pre-startup and startup</li> <li>13) Investigation of accidents</li> <li>14) Risks related to H2S and other toxic gases</li> </ul>	30 Days
24	<p><b>Risk and Reliability Engineering</b></p> <ul style="list-style-type: none"> <li>1) Risk analysis and Reliability engineering</li> <li>2) Uncertainty determination and management</li> <li>3) Deterministic and probabilistic models</li> <li>4) Integrated reliability analysis and Statistics for risk and reliability analyses</li> <li>5) Use of tools (RARE™ and Crystal Ball™) for goodness-of-fit tests and Monte Carlo simulation</li> <li>6) Reliability, availability, and maintainability (RAM) analysis for repairable equipment</li> <li>7) Methods for availability and calculation of expected</li> </ul>	30 Days

	<p>number of failure events for repairable equipment</p> <ol style="list-style-type: none"> <li>8) Forecasting failures and availability of an ESP installation</li> <li>9) Principles of economic analysis: Projected cash flow, discount rate, net present value (deterministic model and probabilistic model)</li> <li>10) Risk analysis: Dimensioning risk for undesirable events, qualitative and semi-quantitative methods for risk analysis, quantitative risk analysis (QRA) and ESP installation example</li> <li>11) Determining risk mitigation actions</li> <li>12) Risk and profitability matrix</li> </ol>	
25	<p><b>Subsea Production Systems and Technologies</b></p> <ol style="list-style-type: none"> <li>1) Subsea Production Systems (SPS) concepts, definitions, and commonly used architectures</li> <li>2) General design requirements and drivers</li> <li>3) SPS equipment, selection, and operation</li> <li>4) Flow lines and Flow assurance</li> <li>5) Maintenance and repair</li> <li>6) Subsea well intervention</li> <li>7) Digital oil field</li> <li>8) Production monitoring, control and optimization technology</li> <li>9) Data acquisition and data management</li> <li>10) Integrated systems and Discussion and integrated system examples</li> </ol>	30 Days
26	<p><b>Automation, Instrumentation, Measurements, and Process Control</b></p> <ol style="list-style-type: none"> <li>1) Sub-surface-surface automation concept</li> <li>2) Automation pyramid</li> <li>3) Process control: Centralized control, optimization, integration</li> <li>4) Telecommunication</li> <li>5) Quantification of value creation</li> <li>6) Identification of opportunities to add value using subsurface-surface automation technologies</li> <li>7) Improvement on deferred production</li> <li>8) Inline production optimization</li> <li>9) Typical solutions of subsurface-surface automation system and potential benefits</li> <li>10) Fluids measurements and custody transfers</li> <li>11) Automated well tests</li> <li>12) Artificial lift automated control</li> <li>13) Bottomhole sensors and intelligentwells</li> </ol>	30 Days

	<ul style="list-style-type: none"> <li>14) Monitoring and diagnosis applications and Inline optimizers</li> <li>15) n Diagnosis and optimization of integrated system</li> <li>16) Technological solutions and automation platforms</li> <li>17) Standards and recommended practices</li> </ul>	
27	<p><b>Selection, Operation, and Maintenance of Pumps, Compressors, and Prime Movers</b></p> <ul style="list-style-type: none"> <li>1) Pump classifications and Dynamic pump calculations</li> <li>2) Cavitation and performance curves</li> <li>3) Dynamic pump construction</li> <li>4) Pump operations and troubleshooting</li> <li>5) Classification, operation, and troubleshooting of positive displacement pumps</li> <li>6) Fundamentals and classification of compressors</li> <li>7) Operation and troubleshooting of centrifugal compressors</li> <li>8) Operation, maintenance, and troubleshooting of reciprocal compressors</li> <li>9) Seal systems and Prime mover equipment</li> <li>10) Gas turbines and Electrical motors and diesel engines</li> <li>11) Types of maintenance and maintenance tools</li> </ul>	30 Days
28	<p><b>Heavy Oil Gathering and Transport System</b></p> <ul style="list-style-type: none"> <li>1) Heavy oil production system, nodal analysis, flow of fluids, and surface processing</li> <li>2) Isothermal flow in pipeline, incompressible single-phase flow</li> <li>3) Temperature profiles in pipelines</li> <li>4) Crude oil diluents and hydraulic analysis to determine optimal volumes</li> <li>5) Impacts of diluents on density, viscosity, pressure requirement</li> <li>6) Effect of terrain topography on heavy oil transport, including water as conveyance medium</li> <li>7) Gas-liquid flow in a gathering system, correlations</li> <li>8) Structure of gathering network and basic equations</li> </ul>	30 Days
29	<p><b>Pipeline Design, Operation, and Maintenance</b></p> <ul style="list-style-type: none"> <li>1) Fluid flow: Single phase and multiphase</li> <li>2) Use of software for simulation of gathering network</li> <li>3) Pipeline surveys</li> <li>4) Pipeline codes, legislation, and classifications</li> <li>5) Pipeline designs</li> <li>6) Material characteristics and selection</li> <li>7) Pipeline construction and commissioning</li> </ul>	30 Days

	<ul style="list-style-type: none"> <li>8) Pipeline external protection and Pigging</li> <li>9) Pipeline integrity management and maintenance</li> </ul>	
30	<p><b>Maintenance Management and Control Indicators</b></p> <ul style="list-style-type: none"> <li>1) Maintenance: Definition, evolution, and classification of standardized indicators (types and application)</li> <li>2) Data selection and analysis for KPIs</li> <li>3) Efficiency indicators: Mean time between failure, mean time to repair, availability, and reliability</li> <li>4) Performance indicators: Absenteeism, overtime, contracted manpower, training, and training plan</li> <li>5) Costs indicators and Safety indicators</li> <li>6) Economic indicators: NPV and ROI</li> <li>7) Maintenance indicators: How to make it run</li> <li>8) Analysis of actual cases and Deviation analysis</li> </ul>	30 Days