TECHNICAL EDUCATION ACADEMY

School of Engineering

COURSE PROGRAMME

000110

PROD006 - Basic Petroleum Technology

The oil industry is the largest and most important industry in the world today.



Learn from the Best in the Business!

Course overview

Foundation level

Why take this course

The oil industry is the largest and most important industry in the world today. This 5-day Basic Petroleum Technology training programme provides and introduction to this diverse and fascinating business – from petroleum exploration to refined product marketing and sales.

This course presents a non-technical, practical understanding of petroleum industry technology in an interesting, effective, and efficient manner. It will explain the important concepts in reservoir and well drilling and intervention, productivity optimisation, various recovery mechanisms, as well as covering various operational issues.

Also discussed are the drivers that dictate world oil and gas prices, and the forces behind the changes taking place in the dynamic market. The roles of the integrated operators, independent producers and refiners, and oilfield service companies are also presented.

Who it is for and how it helps

This course is designed for non-technical support staff involved in oil and gas companies or the service sector seeking to gain a better understanding of the industry they work in.

What you will learn

- Understand the global oil and gas related statistics, such as reserves, production, consumption and exports
- Explain both upstream, middle stream and downstream operations and related facilities
- Appreciate various methods and techniques used to explore, drill, produce, treat and transport oil, gas and their products
- Explain the typical oil and gas operations facilities from wellhead, flow lines, separators, tanks, pumps and compressors, pipelines, gas treatment and processing and refinery operations
- Understand the basic concept with regards to evaluating oil and gas reserves, artificial lift and enhancing recovery
- Understand the challenge associated with this industry such as offshore operations, horizontal drilling and other safety concerns
- Get a general feel for petroleum economics and risk analysis

Curriculum

Modules 01–05

01 Introduction to the Petroleum Industry

- Historical Overview – Significant historical events and milestones; Key industry players (IOCs, NOCs, independents, service companies); Evolution of “Seven Sisters” and independents
- Global Oil & Gas Landscape – Reserves, production, consumption, exports; Anatomy of an oil company
- Industry Segments – Upstream, midstream, downstream overview; Basic definitions (hydrocarbons, oil vs. gas, etc.)

02 Basic Geology

- Earth’s Dynamics – Plate tectonics, mountain building; Sediment formation and erosion processes
- Rock Types and Properties – Clastic, carbonate, and others; Porosity and permeability fundamentals

03 Petroleum Geology

- Origin of Petroleum – Organic theory; Maturation of source rocks
- Reservoir Characterization – Depositional environments; Reservoir rock properties (porosity, permeability); Traps and seals

04 Exploration Fundamentals

- Geological & Geophysical Techniques – Geological mapping, aerial photos; Seismic surveys (2D and 3D)
- Well Logs & Coring – Types of well logs; Core sampling and analysis
- Prospect Generation – Integration of geology and geophysics; Risk assessment and chance of success

05 Drilling Operations

- Drilling Rig Types & Components – Onshore vs. offshore rigs; Rig systems (rotary, top drive, etc.)
- Drilling Process – Drilling fluids (mud circulation); Casing and cementing; Tripping, fishing operations
- Directional & Horizontal Drilling – Techniques and equipment differences; Underbalanced drilling, coiled tubing; Applications (old oil fields, shale plays)

Curriculum

Modules 06–10

06 Formation Evaluation & Well Completion

- Formation Evaluation Methods – Log interpretation (electric, sonic, nuclear); Sidewall coring, DST; Pressure data analysis
- Well Completion – Running production casing; Perforation methods; Wellhead and Christmas tree installation

07 Production Operations

- Reservoir Drive Mechanisms – Primary, secondary (waterflood, gas injection), tertiary (EOR)
- Production Systems – Artificial lift (rod pumps, gas lift, ESPs); Separation facilities (separators, tanks); Flowlines, pumps, compressors
- Production Optimization – Decline curve analysis; Workovers and stimulation

08 Non-Conventional Resources

- Overview of Unconventional Plays – Shale oil/gas, tight sandstones, coalbed methane; Oil sands, oil shales, gas hydrates
- Key Technologies – Horizontal drilling with multi-stage fracturing; Environmental, cost, and logistical challenges

09 Refining & Processing

- Refining Processes – Distillation (atmospheric, vacuum); Catalytic cracking, hydrotreating
- Gas Processing & Treatment – NGL recovery, sweetening; LNG basics
- Product Distribution – Specifications of end products; Supply chain considerations

10 Pipeline Systems & Transportation

- Pipeline Design & Construction – Materials, route selection, safety considerations; Pigging and inspection
- Transportation Logistics – Oil tankers, LNG carriers; Storage facilities and terminals
- Operation & Maintenance – Flow assurance, leak detection; Regulatory standards

Curriculum

Modules 11–15

11 Health, Safety, & Environment (HSE)

- Regulations & Standards – Key global and regional HSE regulations; Offshore and onshore safety practices
- Environmental Impact – Emissions, spills, waste management; Mitigation and control measures
- Emergency Response – Contingency planning; Crisis management

12 Regulatory Framework, Mineral Rights, & Land

- Government Oversight – Licensing rounds, drilling licenses; Abandonment procedures
- Agreements & Contracts – PSCs/PSAs, farmout agreements; Royalties, relinquishments
- Mineral vs. Surface Rights – Historical narratives; Drill spacing units; Production service contracts

13 Petroleum Economics & Risk Analysis

- Oil & Gas Pricing – History of oil price fluctuations; OPEC’s role and market influences
- Supply & Demand Dynamics – Global consumption trends; Strategic reserves
- Project Economics – CAPEX, OPEX, net present value (NPV); Cost overruns, budget risk
- Risk Management – Drilling risk, production decline; Portfolio management, chance of success

14 Project Management in the Petroleum Industry

- Project Lifecycle – Exploration to decommissioning; Key milestones and decision gates
- Planning & Execution – Budgeting, scheduling, resource allocation; Stakeholder engagement
- Risk & Quality Management – HSSE integration; Procurement and contract strategies

15 Advanced Technologies & Future Trends

- Digital Transformation – Automation, AI, data analytics; Real-time drilling monitoring, predictive maintenance
- Enhanced Oil Recovery Innovations – Chemical, thermal, microbial methods
- Sustainability & Low-Carbon Initiatives – Carbon capture, utilization, and storage (CCUS); Renewable energy integration
- Industry Outlook – Emerging markets; Transition scenarios

Participation and contacts

Joining the programme

Contact the Academy and quote course code 000110 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
www.tecedu.academy

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