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COURSE BROCHURE

# Advanced Oil and Gas Process Engineering for Gas Treating Training Course

21 March – 1 April 2027
Muscat

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Registered in the United Kingdom and Saudi Arabia

# Advanced Oil and Gas Process Engineering for Gas Treating Training Course

**Ref:** 1287_48354 **Date:** 21 March – 1 April 2027 **Location:** Muscat **Fees:** 11700 GBP

Oil and Gas Process Engineering for Gas Treating is a 2-week training course for process engineers and plant technical leads who design, rate and troubleshoot gas conditioning trains, and each participant produces a gas treating design basis and optimisation case. Sourer feeds, tighter sales gas specifications and pressure to recover more liquids are stretching existing plants. Jupiter Prime Training delivers Oil and Gas Process Engineering for Gas Treating.

## Why Oil and Gas Process Engineering for Gas Treating Matters Now

Three forces shape gas treating today. New reservoirs bring higher hydrogen sulphide, carbon dioxide and mercury content, so units built for sweeter gas now run near their limits. Gas buyers and pipeline operators enforce strict water and hydrocarbon dew points, heating value and contaminant limits. Plant owners and communities expect lower flaring, less solvent loss and safer handling of toxic streams. A plant that treats gas well sells every molecule on specification; one that does not faces off-spec penalties, shutdowns and exposure risks. The course rests on thermodynamic modelling, steady-state process simulation, hazard and operability study HAZOP and recognised American Petroleum Institute API practices for relief and equipment.

## Who Gains Most from Oil and Gas Process Engineering for Gas Treating

- Engineers who size and rate separators, absorbers, regenerators and exchangers in gas plants
- Technical leads accountable for sales gas quality and unit availability
- Process specialists who build and maintain simulation models of treating trains
- Engineers screening revamp options when feed composition or throughput changes
- Design reviewers who sign off relief, blowdown and toxic gas safeguards

Gas plant technical departments gain most when design, operations support and process safety engineers attend together and share one model of their treating train.

## Oil and Gas Process Engineering for Gas Treating Capabilities

Participants move from operating a treating train to specifying, rating and improving it against contaminant loads, dew point targets and safety limits.

- Calculate phase behaviour and hydrate formation conditions for a raw gas feed — inhibitor and heating choices
- Design an amine sweetening loop including solvent selection and circulation rate — acid gas removal targets
- Rate a glycol dehydration unit against water dew point specification — sales gas contracts
- Specify compression and refrigeration for liquids recovery and dew point control — energy and product value
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Build and validate a steady-state simulation of a treating train — revamp and debottlenecking decisions
- Assess relief, blowdown and toxic release safeguards — process safety sign-off

## Key Oil and Gas Process Engineering for Gas Treating Terms

- Acid gas — hydrogen sulphide and carbon dioxide in natural gas, removed to meet corrosion, toxicity and sales specifications.
- Amine sweetening — absorption of acid gas into an aqueous amine solvent, regenerated by heat in a stripping column.
- Glycol dehydration — removal of water vapour from gas by contact with triethylene glycol, regenerated in a reboiler.
- Hydrocarbon dew point — the temperature at which liquid hydrocarbons first condense from gas at a given pressure.
- Hydrate — an ice-like solid of water and light hydrocarbons that forms at high pressure and low temperature and blocks lines.
- Lean loading — the acid gas left in regenerated amine, which sets how deeply the absorber can treat the gas.

## Oil and Gas Process Engineering for Gas Treating Day by Day

### Day 1: Raw Gas Composition and Treating Targets

- Feed Gas Characterisation and Contaminant Inventory — Treating Train Scope
- Sales Gas and Pipeline Specification Review — Required Treating Depth
- Block Flow Diagrams for Gas Plants — Unit Sequence and Interfaces
- Design Basis Document Structure — Agreed Assumptions and Margins
- Operating Envelope Definition for Feed Changes — Future Flexibility

### Day 2: Thermodynamics and Phase Behaviour

- Equation of State Selection for Sour Gas — Model Accuracy
- Phase Envelopes and Cricondentherm Analysis — Dew Point Control Strategy
- Hydrate Prediction and Inhibitor Dosing — Methanol or Glycol Choice
- Water Content of Sour Gas Estimation — Dehydration Duty
- Property Package Validation Against Lab Data — Simulation Confidence

### Day 3: Inlet Separation and Liquid Handling

- Slug Catcher Sizing and Liquid Surge Volume — Inlet Stability
- Three-Phase Separator Design and Internals — Carry-Over Prevention
- Filter Coalescer Specification — Protection of Amine and Glycol Units
- Condensate Stabilisation Column Design — Vapour Pressure Specification
- Produced Water Routing From Gas Plants — Disposal Interfaces

## Day 4: Acid Gas Removal With Amines

- Amine Solvent Selection Matrix — Selectivity, Loading and Energy Trade-Offs
- Absorber Tray and Packing Rating — Approach to Equilibrium
- Regenerator Reboiler Duty and Lean Loading — Steam Consumption
- Foaming, Degradation and Heat-Stable Salts Diagnosis — Solvent Health
- Amine Unit Corrosion Control Measures — Material and Velocity Limits

## Day 5: Dehydration and Contaminant Removal

- Triethylene Glycol Contactor Design — Water Dew Point Achievement
- Glycol Regeneration and Stripping Gas Options — Lean Glycol Purity
- Molecular Sieve Bed Sizing and Cycle Design — Cryogenic Feed Dryness
- Mercury Removal Bed Placement — Aluminium Exchanger Protection
- BTEX and Vent Emission Control on Regenerators — Environmental Permits

## Day 6: Compression, Refrigeration and Liquids Recovery

- Centrifugal and Reciprocating Compressor Selection — Inlet and Export Duty
- Compressor Performance Curves and Surge Control — Operating Margin
- Propane Refrigeration Loop Design — Dew Point Unit Duty
- Turboexpander Liquids Recovery Schemes — NGL Yield Versus Power
- Fractionation Train Overview for NGL — Product Slate Choices

## Day 7: Heat Exchange and Sulphur Handling

- Shell and Tube Exchanger Rating — Fouling and Pressure Drop
- Brazed Aluminium and Plate Exchanger Selection — Cold Box Design
- Heat Integration Between Treating Units — Fuel Gas Savings
- Claus Sulphur Recovery Process Overview — Acid Gas Disposal Route
- Tail Gas Treating and Acid Gas Injection Options — Sulphur Emission Limits

## Day 8: Process Simulation and Debottlenecking

- Steady-State Model Build for a Treating Train — Base Case Match
- Plant Data Reconciliation Against Model — Hidden Constraints
- Capacity Bottleneck Identification by Unit — Revamp Targets
- Case Studies for Sourer or Richer Feed — Retrofit Scope
- Energy Optimisation Using Simulation Sensitivities — Operating Cost

## Day 9: Process Safety Design for Sour Gas

- HAZOP of an Amine and Glycol Train — Safeguard Gaps
- Relief Load Calculation per API Practice — Relief Valve and Flare Sizing
- Emergency Depressurisation and Blowdown Design — Low Temperature Embrittlement
- Hydrogen Sulphide Dispersion and Detection Layout — Personnel Protection
- Layer of Protection Analysis for Treating Units — Instrumented Safeguard Needs

## Day 10: Practising the Gas Treating Design Basis and Optimisation Case

- Feed and Specification Basis From Days 1 and 2 — Case Framing
- Amine and Dehydration Rating From Days 4 and 5 — Unit Limits
- Simulation Results From Day 8 — Revamp Option Ranking
- Safety Review Findings From Day 9 — Design Conditions
- Completing the Gas Treating Design Basis and Optimisation Case — Plant Proposal

## Applying Oil and Gas Process Engineering for Gas Treating After the Course

- Update the plant simulation with current feed analysis and compare predicted and actual lean loading and dew points.
- Lead a solvent health review of the amine loop covering foaming, heat-stable salts and reboiler duty, and propose corrective steps.

## Oil and Gas Process Engineering for Gas Treating Questions FAQ

### What is Oil and Gas Process Engineering for Gas Treating and why does it matter now?

It is the design and optimisation of units that remove acid gas, water, mercury and heavy hydrocarbons from raw gas. It matters now because sourer feeds and stricter sales specifications push existing plants towards their limits.

### Which roles gain most from Oil and Gas Process Engineering for Gas Treating?

Process engineers and plant technical leads gain most, especially those who rate absorbers and contactors, maintain simulation models, screen revamps or sign off relief and toxic gas safeguards in gas plants and associated gas facilities.

### How does Oil and Gas Process Engineering for Gas Treating differ from a general process debottlenecking course?

It concentrates on the gas conditioning chain. Rather than generic distillation and equipment rating, you work on amine sweetening, glycol and sieve dehydration, liquids recovery, sulphur handling and sour gas safety at an advanced design level.

### What do you bring back from Oil and Gas Process Engineering for Gas Treating?

You bring back a design basis and optimisation case for your own treating train, linking feed data, unit ratings, simulation findings and safety conditions into a proposal your plant can act on.

## Oil and Gas Process Engineering for Gas Treating: The Way Forward

The gas treating design basis and optimisation case first informs whether a plant can accept a sourer or larger feed without a new train. Process engineers, operations leads and safety reviewers use it to agree revamp scope. After its first use, the thermodynamic assumptions and solvent choices deserve another look, because feed composition and specifications rarely stay fixed.