



Prof. Abdelbaki Benamor

Abdelbaki Benamor is a Research Professor at the Gas Processing Centre (GPC) at Qatar University, specializing in carbon capture and gas treatment processes since 2011. He holds a PhD in Chemical Engineering from the University of Malaya. He has more than sixteen years of post-doctorate experience in academic and industrial research and development, incorporating all aspects of carbon capture and natural gas treatment processes. Prof. Benamor has managed most of the carbon capture research programs conducted within the GPC, comprising more than five major research programs of 2-4 years duration varying from bench scale to pilot scale levels. His research and industry grants are conducted in collaboration with internationally recognized institutions in Europe, Asia, and North America. Prof. Benamor has authored and co-authored many research papers in renowned journals and conference proceedings.

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Natural Gas Processing & Conditioning

Date: 5-9 October 2025
Time: 8:00 AM to 2:00 PM
Venue: Qatar University, H-10, F-101
Cost: QAR 8,000/participant (Min. 5 participants)

About the course

This course provides a comprehensive overview of natural gas treatment processes, operation, and troubleshooting. The process flow diagram shows how the various individual plant operations are integrated to create a gas plant capable of handling feeds from gas fields. Participants will learn about the significant processes involved in gas processing, including dehydration, acid gas removal, sulfur recovery, tail gas cleanup, compression, cryogenic extraction of natural gas liquids (NGL), and liquefied natural gas (LNG) production. The course concludes with team participants proposing a design for a simulated gas processing plant. Ultimately, participants will be introduced to the state-of-the-art CO₂-capturing pilot plant at the GPC.

Course content

Introduction to natural gas

- Natural gas: composition, natural gas sources, natural gas supply chain

Field processing of natural gas - quality standards

- Constituents causing problems with storage, transport, or use of natural gas
- Specifications and quality requirements for natural gas
- Treatment needed to comply with the required specifications
- Example of commercial natural gas compositions

Gas dehydration and hydrate formation inhibition

- System behavior - Moisture content of saturated gas
- Hydrate formation conditions.
- Hydrate formation inhibition using MeOH, MEG, DEG, ...
- Gas dehydration processes. Application: Design of TE Gunit

Gas sweetening: removal of acid components

- Overview of gas sweetening technologies
- Chemical solvent processes - Amine units (MEA), Physical solvent processes, Hybrid processes (physicochemical solvent), Other techniques
- Conversion of H₂S (CLAUS process), tail gas processing
- Application: Design of a CO₂-amine unit

Natural gas liquids (NGL) extraction

- External refrigeration loop. Joule-Thomson expansion. Turbo-Expander
- Application: Simulation calculation of a cryogenic loop

Liquefied Natural Gas (LNG)

- Liquefaction processes: operating principle and conditions,
- Equipment specification (heat exchangers, refrigeration loop compressors...), energy consumption..., LNG storage and transport, safety considerations
- Examples of industrial natural gas liquefaction units

Case study: Simulation design of a natural gas field processing plant.

Eligibility criteria

The course is suitable for engineers, chemists, technologists, and lab specialists working in water treatment and purification for industrial effluents.