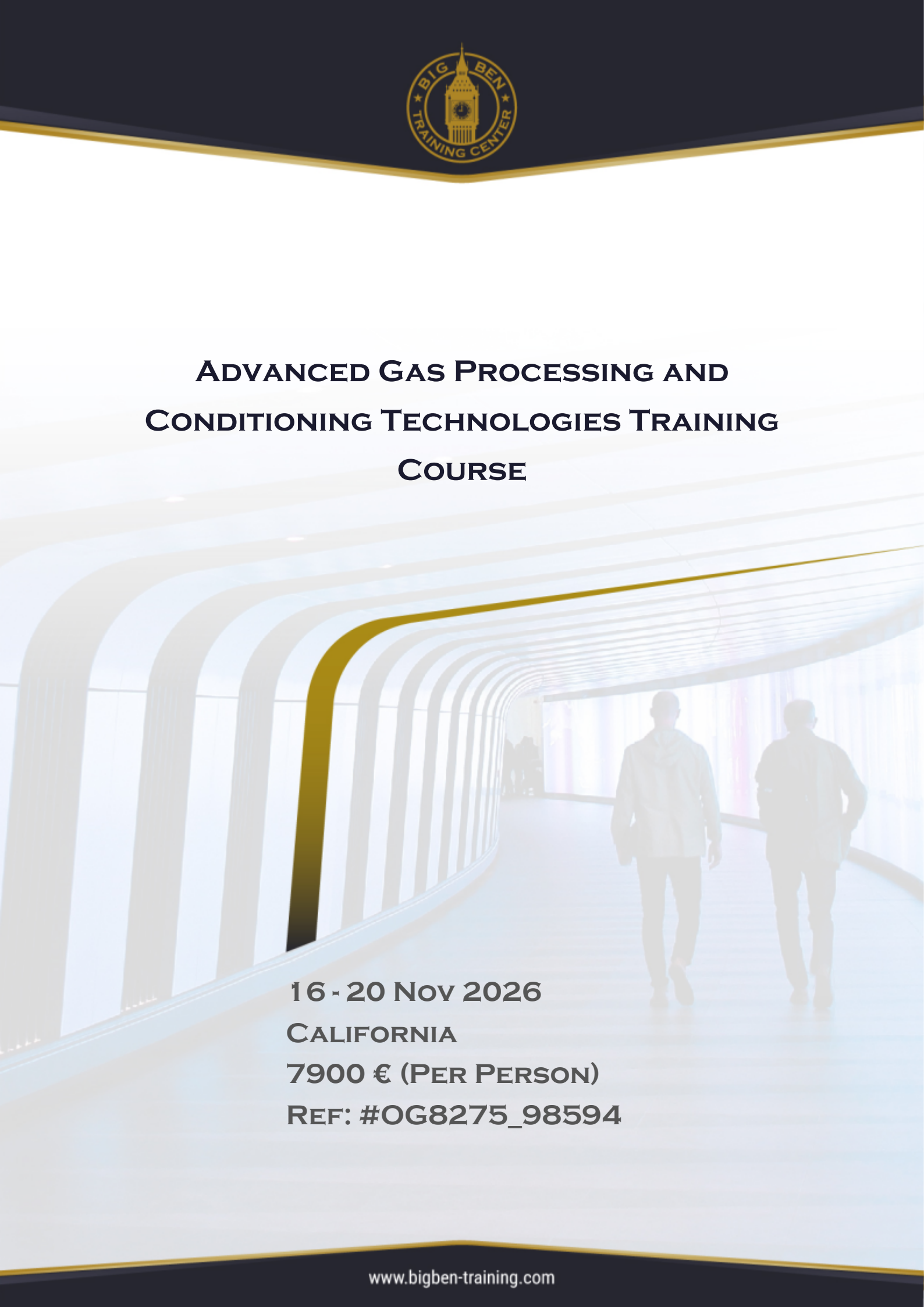
Advanced Gas Processing and Conditioning Technologies Training Course



16 - 20 Nov 2026

California

7900 € (Per Person)

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Course Introduction / Overview:

This comprehensive course provides an in-depth exploration of the principles and practices of natural gas processing and conditioning. In an era of evolving energy demands and stringent environmental regulations, mastering these technologies is crucial for operational efficiency, safety, and profitability. This program, offered by BIG BEN Training Center, is meticulously designed to cover the entire gas treatment chain, from wellhead to pipeline specifications. Participants will delve into critical processes such as acid gas removal, dehydration, NGL recovery, and sulfur management. The curriculum is grounded in established engineering principles, drawing from foundational texts like "Fundamentals of Natural Gas Processing" by Arthur J. Kidnay, ensuring a robust theoretical understanding. However, the course emphasizes practical application, equipping attendees with the skills to troubleshoot operational issues, optimize plant performance, and make informed decisions on technology selection. By integrating fundamental science with modern industrial practices, this training provides a holistic view of gas processing, preparing professionals to tackle the complex challenges of today's energy landscape.

Target Audience / This training course is suitable for:

- Process Engineers.
- Chemical Engineers.
- Production Engineers.
- Facility and Plant Engineers.
- Operations Personnel and Supervisors.
- Project Engineers and Managers.
- Technical Specialists in the Oil and Gas Industry.
- Reservoir and Petroleum Engineers.
- Junior and Senior Engineers seeking to specialize in gas processing.

Target Sectors and Industries:

- Oil and Gas Exploration and Production Companies (Upstream).
- Natural Gas Transmission and Processing Companies (Midstream).
- Petrochemical and Refining Plants (Downstream).
- Engineering, Procurement, and Construction (EPC) Companies.
- Consulting Firms specializing in energy projects.
- Governmental bodies and regulatory agencies overseeing the energy sector.
- Technology and equipment manufacturing companies for the gas industry.

Target Organizations Departments:

- Engineering and Design Departments.
- Operations and Production Departments.
- Process Technology and Development Departments.
- Technical Support and Troubleshooting Teams.
- Project Management Departments.
- Health, Safety, and Environment (HSE) Departments.
- Asset Management and Integrity Departments.

Course Offerings:

By the end of this course, the participants will have able to:

- Analyze the composition and phase behavior of natural gas streams.
- Select and evaluate appropriate technologies for acid gas removal and sweetening.
- Design and troubleshoot glycol dehydration units for water content control.
- Understand the mechanisms of hydrate formation and apply effective inhibition strategies.
- Assess different methods for Natural Gas Liquids (NGL) recovery and fractionation.
- Explain the principles of cryogenic processing and turbo-expander plants.
- Describe the Claus process for sulfur recovery and tail gas treatment options.
- Identify and propose solutions for operational problems in gas processing facilities.
- Perform basic economic evaluations of different gas treatment schemes.
- Apply safety and environmental considerations to gas plant design and operation.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and engaging learning environment that bridges theory and practice. This course moves beyond traditional lectures to incorporate a blended learning approach. Sessions are highly interactive, featuring expert-led presentations, open discussions, and Q&A panels to encourage knowledge sharing and collaborative problem-solving. A significant portion of the curriculum is dedicated to practical application through the analysis of real-world case studies, allowing participants to dissect complex operational challenges and evaluate successful solutions. Group workshops and team-based exercises will be utilized to simulate plant-level decision-making processes, enhancing participants' analytical and strategic thinking skills. The course will also feature demonstrations of process simulation concepts to illustrate the impact of operational variables on plant performance. Continuous feedback and guided practice are integral to our approach, ensuring that participants can confidently apply the learned concepts and techniques directly to their professional roles upon completion of the training.

Course Agenda (Course Units):

Unit One: Fundamentals of Natural Gas and Gas Processing

- Introduction to the natural gas industry and value chain.
- Physical and chemical properties of natural gas components.
- Phase behavior of hydrocarbon mixtures and phase envelopes.
- Understanding gas specifications for sales and transportation.
- Introduction to key gas conditioning and processing units.
- Water content and hydrate formation theory.
- Overview of process simulation in gas plant design.

Unit Two: Acid Gas Removal and Gas Sweetening

- Sources and problems of acid gases (H2S, CO2).
- Overview of gas sweetening technologies.
- Chemical solvents and the amine treating process.
- Physical and hybrid solvents for bulk acid gas removal.
- Membrane separation technology for CO2 removal.
- Process selection criteria for sweetening units.
- Troubleshooting common problems in amine units.

Unit three: Gas Dehydration and Hydrate Inhibition

- Principles of gas dehydration and water dew point control.
- Absorption with triethylene glycol (TEG) units.
- Design and operation of TEG contactors and regenerators.
- Adsorption with solid desiccants (molecular sieves).
- Hydrate prediction and prevention methods.
- Chemical inhibition with methanol and glycols (MEG).
- Low-temperature separation and hydrate control.

Unit Four: Hydrocarbon Dew Point Control and NGL Recovery

- Objectives of hydrocarbon dew point control.
- Mechanical refrigeration systems for chilling.
- Joule-Thomson (J-T) expansion processes.
- Cryogenic processing using turbo-expanders.
- Principles of NGL fractionation and product stabilization.
- Design and operation of de-ethanizers, de-propanizers, and de-butanizers.
- Comparing different NGL recovery technologies.

Unit Five: Sulfur Recovery, LNG, and Special Treatments

- The Claus process for elemental sulfur recovery.
- Tail gas treatment units (TGTU) for enhanced sulfur recovery.
- Introduction to Liquefied Natural Gas (LNG) production.
- Overview of major LNG liquefaction cycles.
- Nitrogen Rejection Units (NRU) principles and technologies.
- Mercury removal from natural gas streams.
- Flare gas recovery systems and environmental considerations.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As global energy demands shift towards sustainability, how might traditional gas processing facilities be retrofitted or redesigned to integrate carbon capture and utilization (CCU) technologies without compromising economic viability?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by offering a holistic and pragmatic perspective on gas processing, moving beyond purely theoretical instruction. While many programs focus on singular aspects of gas treatment, this curriculum is designed to provide a comprehensive, A-to-Z understanding of the entire processing chain, from wellhead analysis to final product specifications. Its core strength lies in the emphasis on the "why" behind the "how," ensuring participants not only learn the operational steps of each technology but also grasp the fundamental engineering principles that govern their selection and performance. The content is deeply rooted in real-world applications, integrating extensive case studies and troubleshooting scenarios that reflect the actual challenges faced in modern gas plants. Rather than just presenting textbook solutions, the course encourages critical thinking and analytical problem-solving. It uniquely balances technical depth with economic and environmental considerations, preparing participants to make well-rounded decisions that optimize efficiency, ensure safety, and align with evolving industry regulations. This practical, integrated approach equips professionals with immediately applicable skills and a deeper, more strategic understanding of gas processing operations.