

Who Should Attend?

This course, the "Campbell Gas Course™", has been the standard of the industry for well over thirty (30) years. It deals with the practical planning, design, specification and operation of gas processing and production systems. Over 20,000 engineers have attended our G-4 program, considered by many to be the most practical and comprehensive course in the oil and gas industry.

The program is designed for both production and processing personnel. This course emphasizes the practical choice of equipment. Computer analysis is often used to examine sensitivities of technical decisions. No computer experience is necessary.

Operating issues, performance evaluation and control systems are also discussed.

The Participant Will Learn How To:

- Select and evaluate processes used to dehydrate natural gas, meet hydrocarbon dewpoint specifications and extract NGLs
- Apply physical/thermodynamic property correlations, principles to the design and evaluation of gas processing facilities
- Perform and review equipment sizing correlations for major process equipment, and
- Recognize and develop solutions to operating problems and control issues in gas processing facilities

Gas Conditioning and Processing (G-4)

Course Outline

Daily schedule is approximate.

DAY 1	<p>TOPICS</p> <p>Introduction to gas processing; gas and liquid contracts and specifications; gas process systems and options; physical properties of hydrocarbon fluids; and phase behavior.</p> <ul style="list-style-type: none"> • Course Introduction • Gas Processing Systems • Physical Properties of Hydrocarbons • Qualitative Phase Behavior 	DAY 6	<p>TOPICS</p> <p>Heat Exchangers - Overview, design and specification, shell and tube, plate, plate fin, heaters, cooling towers, and aerial coolers; pump principles; power and head; NPSH evaluation of pump performance and system curves; positive displacement and centrifugal pumps; and pump control.</p> <ul style="list-style-type: none"> • Heat Transfer • Pumps
DAY 2	<p>TOPICS</p> <p>Principles of vapor-liquid equilibrium; K-values; dewpoints; bubblepoints; flash calculations; water content of natural gas; and hydrates.</p> <ul style="list-style-type: none"> • Vapor-Liquid Equilibrium • Water-Hydrocarbon Behavior 	DAY 7	<p>TOPICS</p> <p>Overview and principles of compression including reciprocating and centrifugal compressors, power consumption, performance curves, axial compressors, compressor drivers and compressor control; principles of refrigeration including pressure vs. enthalpy charts, basic simple refrigeration cycle, economizer systems, power consumption, condenser load and mixed refrigerants; LTS/LTX processes; and turboexpanders.</p> <ul style="list-style-type: none"> • Compressors • Refrigeration
DAY 3	<p>TOPICS</p> <p>Hydrate inhibition with glycols and alcohols, low dosage; energy balances; energy and power; enthalpy/entropy; tables of data; and general correlations for enthalpy and entropy.</p> <ul style="list-style-type: none"> • Water-Hydrocarbon Behavior (Cont'd) • Basic Thermodynamic Concepts • System Energy Changes 	DAY 8	<p>TOPICS</p> <p>Fractionator operation, design and specification; mass transfer fundamentals; minimum reflux theoretical plates; overall efficiency; energy balances; and oil stabilizers.</p> <ul style="list-style-type: none"> • Refrigeration (Cont'd) • Fractionation
DAY 4	<p>TOPICS</p> <p>Control modes (proportional, reset, derivative); valve characteristics; DCS and PLCs; flow measurement; examples of control applications, including liquid and gas flow, looped systems, complex systems and 2 phase horizontal and vertical flow.</p> <ul style="list-style-type: none"> • Process Control Fundamentals • Fluid Flow 	DAY 9	<p>TOPICS</p> <p>Principles of glycol dehydration; glycol unit operation and design; absorber design and specification; equilibrium concepts; regeneration; coabsorption of aromatics; troubleshooting; foaming; and corrosion.</p> <ul style="list-style-type: none"> • Fractionation (Cont'd) • Glycol Dehydration
DAY 5	<p>TOPICS</p> <p>Pressure vessel design; principles of separation; vessel sizing - vertical and horizontal, two/three phase; mist extraction; internals and specification; principles of rate processes; series and parallel resistance; and fundamentals of heat transfer.</p> <ul style="list-style-type: none"> • Separation Equipment • Rate Processes 	DAY 10	<p>TOPICS</p> <p>Operation and design of adsorption dehydration systems; properties of desiccants; sizing tower; regeneration requirements; and hydrocarbon recovery units.</p> <ul style="list-style-type: none"> • Glycol Dehydration (Cont'd) • Adsorption Systems • Course Overview