



Centrifugal Compressors Fundamentals for Facilities Engineers - G4 Short Course - Instructor-led + eLearning

COURSE

About the Course

This short course is from the industry-standard Gas Conditioning and Process course (G-4), known globally as the Campbell Gas Course. Each session will follow the format below:

Days 1-2:

- 4 hours prerequisite e-Learning modules (participants may test out)
- 2.5 hours required e-Learning modules

Day 3:

- 4.5 hours virtual, instructor-led session, 9:00-13:30 CDT (GMT-5)

Day 4:

- 3 hours virtual, instructor-led session, 9:00-12:00 CDT (GMT-5)

[Click here to see the full G-4 Short Course listing](#)

This short course covers the fundamentals of centrifugal compressor selection and operations. It also reviews the other types of compressors and their applications. The course online modules cover the following topics:

- Compressor applications, types and selection criteria
- Compressor Head, Power Requirements, and Discharge Temperature
- Principles of Centrifugal Compressor Operations
- Principles of Reciprocating and Rotary Screw Compressor Operations
- Rotating Equipment drivers

The virtual, instructor-led lecture will prepare the participants to do detailed analysis on centrifugal compressors using the vendor's compressor curves. The methods applied will allow one to estimate the required compressor head for a given process operating conditions, estimate the number of impellers required for multistage applications, analyze the effect of changing inlet conditions to centrifugal compressor performance, interpret centrifugal compressor curves, and understand the basics of centrifugal compressor controls.

The problem assignment will review two different centrifugal compressor applications. The first problem assignment involves determining the new operating envelope for a fixed speed centrifugal compressor that

was specified for a new field development where the initial production conditions were off from the design conditions of the machine. The second problem investigates a variable speed, multistage centrifugal compressor application and investigate the compressors performance over changing operating conditions, from the initial field start up conditions, through end of life of the plant.

The virtual, instructor-led debrief will provide practical insight in terms of options to mitigate operating limitations of centrifugal compressors, discuss common operating problems and potential solutions for both centrifugal and reciprocating compressors.

Prerequisites, which participants can test out of, include Basic Conversions, Gas and Liquid Physical Properties, Multicomponent Phase Behavior, Thermodynamic Principles and the First Law of Thermodynamics, Second Law of Thermodynamics and Energy Balance Equations, Enthalpy Correlations and Applications of Energy Balance Correlations, Using PH Diagrams to Perform Energy Balance Calculations.

"The course was well structured and informative, a good grounding/revision of compressor fundamentals and first principles. Already this has helped me bring compressor conversions and questions from operators back to engineering fundamentals in my day to day work." - Graduate Process Engineer, United States

"Kindra presented the content very well and made the content and problems very easy to understand. She was engaging as well as open and encouraging of discussion. The way she brought concepts back to problems you may see in the field or how you could trouble shoot something was very beneficial." - Grad Process Engineer, United States

"This is an excellent introductory course to compressors. I have recommended this course to my colleagues." - ICE Engineer, United States

Target Audience

Production and processing personnel involved with natural gas and associated liquids, to acquaint or reacquaint themselves with gas conditioning and processing unit operations.

This course is for facilities engineers, process engineers, senior operations personnel, field supervisors, and engineers who select, design, install, evaluate, or operate gas processing plants and related facilities.

These short courses are ideal for mid-career professionals that have experience in the industry and have been transferred to a new role or assignment.

They are also ideal for new engineers that need to get up to speed quickly on the primary principles of gas processing with a deep dive on the issues of the short course topics.

You Will Learn

You will learn how to:

- Differentiate between types of compressors and their common applications
- Estimate compressor head, power and discharge temperature for compressor application
- Discuss the principles of centrifugal, reciprocating and screw compressor operation
- Discuss the options for compressor driver selection
- Read and apply centrifugal compressor curves to real world applications
- Analyze the effects of changing inlet gas conditions on centrifugal compressor performance

Course Content

- Pump Applications, Types and Selection
- Head vs Pressure Rise and Pump Power Requirements
- Centrifugal Pumps vs Positive Displacement Pumps
- Cavitation, NPSHR, NPSHA
- Principles of Centrifugal Pump Operations
- Principles of Plunger Pump Operations
- Rotating Equipment Drivers
- Fundamentals of Centrifugal Pumps Lecture
- Self-Directed Problem Assignment
- Problem Debrief and Experience Round Table

Product Details

Categories: [Midstream](#)

Disciplines: [Gas Processing](#)

Levels: [Foundation](#)

Product Type: [Course](#)

Formats Available: [Virtual](#)

Instructors: [Dale Kraus](#) [Mahmood Moshfeghian](#) [Kindra Snow-McGregor](#)