

**HVAC for Industrial Hygienists**  
**A One Day Workshop**  
**Tuesday, December 3**  
**8:00 AM-5:00 PM**  
**Greensboro, NC**

**Join us for a one day seminar designed to enable the Industrial Hygienist to become more proficient when encountering industrial hygiene issues, such as Indoor Air Quality (IAQ), related to HVAC systems.**

**Learning Objectives**

- Present and discuss selected HVAC definitions, as well as, heat transfer and heat generation fundamentals to establish / confirm a common basic understanding.
- Explain and discuss the determination of Heating and Cooling loads to identify critical load factors.
- Review and discuss ASHRAE Standard 62.1 “Ventilation for Acceptable Indoor Air Quality” relative to its application in addressing IAQ problems.
- Explain and discuss Psychrometrics, “the science that deals with the thermodynamic properties of moist air and the utilization of these properties to analyze conditions and processes involving moist air”. The use of the psychrometric chart will be demonstrated and utilized to identify and determine the values of these thermodynamic properties.
- Present and discuss the “Vapor Compression Refrigeration Cycle” as integrated into both direct-expansion and chilled water systems.
- Identify selected commercial, institutional, and industrial HVAC equipment and associated air distribution, as well as, air-to-air heat recovery equipment, and discuss from an application – operation vantage point.
- Identify typical Indoor Air Quality problems, associated with HVAC systems that the Industrial Hygienists encounters. From case studies, discuss underlying causes and solution strategies.

**About The Instructor**

Doug Gunnell is President of Gunnell Engineering Services with more than 45 years of experience in engineering design and management with a Fortune 500 company, and as a consulting engineer in private practice. He is a Registered Professional Engineer and a Life member of the *American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)*. His areas of concentration include industrial and commercial HVAC systems, and industrial ventilation and exhaust systems. Additional areas of expertise include energy management and indoor air quality. Mr. Gunnell has authored a number of engineering articles and been awarded two United States patents. He is an engineering graduate of North Carolina State University where he has been an instructor and lecturer for the Mechanical and Aeronautical Engineering Department, and Continuing and Professional Education as well as the NC Industrial Ventilation Conference over a period of more than 45 years.

**Workshop Fee: \$300 per person     AIHA Carolinas Members-\$250 per person**  
**Registration fee includes training manual, lunch and breaks.**

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**Location: Workplace INTEGRA Training Center, 420-B Gallimore Dairy Road,  
Greensboro, NC 27409**

**PAST PARTICIPANTS HAVE SAID....**

*A comprehensive review of the design and operation of HVAC systems as they apply to Indoor Air Quality. A must for the Indoor Air Quality Professional. Brian Kareis, PE, CIH - Workplace Hygiene, Inc.*

*The descriptions and pictures of HVAC system components and designs are helpful to anyone who performs indoor air quality investigations. The case studies of common IAQ problems relating to poor design, operation, and maintenance of HVAC systems are equally as helpful. This course has enabled me to better diagnose HVAC related issues when conducting IAQ investigations. Tony Watson, CIH, CSP - Workplace Hygiene, Inc.*

**CM POINTS-HVAC for IH contains 6.5 hours of technical contact time and is eligible for ABIH CM credit. We estimate 1 CM point based on technical content and ABIH guidelines.**

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**\_\_\_\_\_ November 15, 2013    REGISTER NOW!    \_\_\_\_\_ December 3, 2013**  
**Workshop Fee \$300/person    \$250/person AIHA Members**

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
Phone: \_\_\_\_\_ E-mail \_\_\_\_\_  
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Check \_\_\_\_\_ Make Check Payable to McElroy-Bacon Consulting Services  
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Amount \$ \_\_\_\_\_ Three Digit Security Code on Back of Card \_\_\_\_\_  
Signature \_\_\_\_\_  
Cardholder's Name (Please Print) \_\_\_\_\_  
Billing Address for Credit Card \_\_\_\_\_

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