



## 2010 Fall Training Schedule



TRAINING

### Classes in Commercial HVAC Systems



Technical  
Engineering  
Energy  
Systems



### Details Inside

#### Damuth Trane

1100 Cavalier Blvd.  
Chesapeake, VA 23323  
757-558-0200 main  
757-558-9715 fax

#### Trane HVAC Parts & Supplies:

1104 Cavalier Blvd.  
Chesapeake, VA 23323  
757-558-8585 main  
757-558-9713 fax

230 Clearfield Ave.  
Suite 126  
Virginia Beach, VA 23462  
757-490-2390 main  
757-490-2937 fax

311 Ed Wright Lane  
Suite E  
Newport News, VA 23606  
757-369-9400 main  
757-369-9401 fax

#### Fall 2010 Schedule Highlights

- 9/7 - LEED 201: Core Concepts & Strategies
- 10/5-7 -Tracer Summit Training
- 10/27 - BD+C 301: Implementing the Building Design + Construction LEED Rating System
- 10/11 - R410A Certification Course & Testing
- 10/12 - Electrical Troubleshooting
- 10/13 - Electrical Schematic Reading for HVAC



# Geothermal Technology Training

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**Date:** Tuesday, August 31, 2010

**Time:** 8-4:30 PM

**Instructor:** Nelson Warthan, Warthan Group

**Audience:** Facility Managers seeking more knowledge on geothermal technology and principles of geothermal systems.

**Cost:** \$250.00 per student (organizations who register 3 or more attendees, pay only \$200.00 per student)

**Description:** This is a one day workshop that looks at the principles of geothermal systems. Students will begin by looking at the heat pump concept and build from there. The course will look at the types of installations, coils, and geographic concerns for geothermal systems. The class will end by focusing on some basic design principles and concepts. In addition, students will look at water and chemical treatment in support of heat pumps and geothermal systems.

**Instructor:** This course will be instructed by Nelson Warthan who is a nationally known speaker, trainer, facilitator and consultant. Nelson has over 40 years of experience in the operations industry in technical fields, regulatory, management and leadership, education and staff development. He is currently a Ph.D Candidate in Operations Engineering, and holds a Masters Degree in Business/Management with secondary emphasis in Law and Insurance. Nelson's Bachelors Degree is in Economics and Business and he also has an Associates Degree in Business and Marketing.

## LEED Core Concepts & Strategies

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**Date:** Tuesday, September 7, 2010

**Time:** 8-5 PM

**Cost:** \$325 (per student)

**Description:** This workshop is intended for anyone who wants more than a basic understanding of LEED - including those with a stake in their company's building practices, those directly involved in green building projects, and those pursuing GBCI's LEED Green Associate credential. This workshop will provide essential knowledge of sustainable building concepts that are fundamental to all LEED Rating systems. It will begin with an introduction to the benefits and integrative approach to green building, a brief background on the U.S. Green Building Council and LEED, including basics of the building certification process. The core of the workshop presents LEED intents and concepts at the credit category level - across building types and rating systems - touching on strategies, synergies and specific examples that are reinforced by real project cases. Key LEED metrics and LEED referenced materials are addressed throughout the workshop.



### Learning Objectives:

- Identify the key components of the LEED rating system.
- Discuss overall LEED Certification Process.
- Describe the intents and associated concepts of each LEED credit category.
- Explain regulations, recognitions and incentives related to each credit category.
- Recognize successful LEED strategies and measurements for achieving credit category goals.

This course provides the foundation required for any 300-level LEED education offering.

*NOTE: As of January 1, 2010, this course does not meet the requirements for GBCI's credential maintenance program and is no longer approved for GBCI CE Hours. However, this course will satisfy the eligibility requirement for taking the LEED Green Associate Exam.*

**For more information on this course or to register please log on to [www.usgbc.org](http://www.usgbc.org).**

# BD+C 301: Implementing the Building Design + Construction LEED Rating System

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**Date:** Wednesday, October 27, 2010

**Time:** 8-5 PM

**Cost:** \$375 (per student)

**Description:** This course formerly called "Green Building Design + Construction: The LEED Implementation Process"

This workshop is intended for professionals who are familiar with the basic concepts of the LEED for New Construction and Major Renovations Rating System, but new to implementing it on projects or looking to brush up on implementation best practices. It is appropriate for new LEED AP's, as well as those pursuing GBCI's LEED AP Building Design + Construction credential.

The workshop will address LEED tools and unique aspects of the New Construction rating system. Workshop participants will discuss the roles and responsibilities of key stakeholders in the LEED process, as well as strategies for communicating with team members at various stages of the process. Official USGBC LEED Faculty who are LEED and facilitation experts will walk the class through the phases of a typical project, including key decisions that project teams must make. Throughout the day, students will engage with other participants in interactive activities using case examples to enable them to work hands-on with LEED implementation strategies and rating system tools, including project forms from LEED Online v3. At the end of the workshop, students should be able to apply newly found knowledge to real-life LEED projects.



For more information on this course or to register please log on to [www.usgbc.org](http://www.usgbc.org).

## ASHRAE 90.1 - 2010



**TRANE**

**Satellite Broadcast**

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**Date:** Wednesday, October 20, 2010

**Time:** 12:00-1:30 PM (Lunch will be served at 11:30 AM)

**Cost:** FREE!

**Description:** An updated version of Standard 90.1 is expected to be published in the Fall 2010. This broadcast will focus on changes pertaining to major envelope, mechanical, lighting and modeling addenda that will be incorporated into the 90.1-2010.

*This course is eligible for 1.5 CEUs for Virginia Professional Engineer's license.*

*AIA and LEED Continuing Education Hours are currently pending and will be finalized September 1, 2010. AIA members, please provide your member number on your registration form.*

*All certificates will be emailed upon request after the seminar.*

# Refrigeration Compressors

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**Date:** Wednesday, September 1, 2010

**Time:** 8-4:30 PM

**Instructor:** Nelson Warthan, Warthan Group

**Audience:** Facility Managers & technicians seeking more knowledge on refrigeration compressors

**Cost:** \$250.00 per student (organizations who register 3 or more attendees, pay only \$200.00 per student)

**Description:** This workshop is designed as a one day look at the fundamentals, types and characteristics of compressors. Students will compare reciprocating, scroll, rotary and centrifugal compressors. The class will end with a discussion on why and how compressors fail and what you can do to help the compressor last longer.

## Boilers

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**Date:** Thursday, September 2, 2010

**Time:** 8-4:30 PM

**Instructor:** Nelson Warthan, Warthan Group

**Audience:** Facility Managers & technicians seeking more knowledge on boilers.

**Cost:** \$250.00 per student (organizations who register 3 or more attendees, pay only \$200.00 per student)

**Description:** This workshop is designed to familiarize students with heat generating vessels - hot water and steam. This one day workshop looks at the vessel, passes, combustion, ignition, tubes, fire tubes, atomization, stacks, boxes, headers, supply and returns, make up water concepts, water treatment, condensation tanks, expansion tanks, boiler safeties, start up processes, maintenance and more.

## Tracer Summit Training

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**Dates:**

Tuesday, October 5 - Entry Level

Wednesday, October 6 - Intermediate

Thursday, October 7 - Advanced

**Time:** 8-4:00 PM (each day)

**Instructor:** Gary Pavlus, Damuth Trane Systems Specialist

**Cost:** \$200.00 per student/ per class or \$525.00 per student for all three days

**Description:** This seminar is intended to assist the end user of a Tracer Summit system. The agenda for each day includes but is not limited to the following topics:

**Beginning:**

- Tracer Summit Overview - to include architecture, applications, acronyms and terminology

- Software Operations - will include working with windows, software startup, logon/logoff, menu structure, graphic navigation and a workshop portion

- Setup Functions - this section will cover site control priorities, site security, alarm & messaging routing, modem and pager editors

**Intermediate:**

- Reports - report viewer, standard reports, editor, workshop

- Applications - event log, area control, VAV basics, chiller plant management, chiller plant demo

**Advanced Summit - entire day will be hands-on:**

- Graphics - creation and modification

- Utilities Function - backup and restore, BCU reset, utilities workshop

- Operating a facility



# Refrigerant Blend & Safe Use of R-410A

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**Date:** Monday, October 11, 2010

**Time:** 8:30-11:30 PM (class instruction), 12:30-1:30 - Exam

**Instructor:** Elmer Franklin

**Cost:** \$175.00 per student (organizations that register 3 or more attendees, pay only \$165.00 per student)

**Description:** The course will cover the service procedures for using refrigerant blends and the precautions when working with refrigerant R410A. It includes service procedures using the various T-P charts, charging procedures and determining evaporator superheat and condenser sub-cooling. As an option the ESCO certification exams will be administered on site following the course.

## Electrical Troubleshooting

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**Date:** Tuesday, October 12, 2010

**Time:** 8-4:30 PM

**Instructor:** Elmer Franklin

**Cost:** \$300.00 per student (organizations that send 3 or more may register at \$275 per student)

**Description:** This course will give the attendee a basic knowledge of voltage, current and resistance relationships as applied to relays, motor control circuits and other types of control circuits. It also covers troubleshooting and installation of lighting circuits including 3-way and 4-way switches. In addition, the course offers hands-on labs in which students participate in a variety of exercises including wiring a circuit to a circuit breaker panel and analyzing the other circuits wired to the panel; draw, wire and power up a series and 2 parallel circuits with switches and lights; using a meter to measure the voltage on a thermocouple; wiring a motor starter and determine the proper overload heater element size, and testing a solenoid valve's operation.

### Course Objectives:

- Identify proper safety protection equipment for electrical maintenance and identify treatment for electric shock.
- Describe the proper use of hand tools used for electrical maintenance and proper care of double and single insulated tools, extension cords and lights.
- Demonstrate the procedure for de-energizing, tagging and locking out power feeds and the procedure to close a tripped circuit breaker, replace a fuse and describe the operation of a ground fault interrupter.
- Demonstrate the use of a voltmeter, ammeter, clamp-on ammeter, ohmmeter and electric consumption meter and identify which test instrument to use to locate troubles.
- Describe, sketch, wire and troubleshoot single-pole, 3-way and 4-way switch circuits.
- Describe the basic electrical concepts of current, voltage, resistance, electrical polarity, open, short and excessive resistance and current and define and apply Ohm's Law.
- Demonstrate solving circuit problems and describe the basic relationships of voltage, current, and resistance in a series, parallel and series parallel circuits.
- Describe relationship of watts to amps and volts and apply the power and energy concepts to determine power consumption, operating cost and other practical problems.
- Identify color coded resistors, capacitors, diodes, simple relays and control transformers and describe operating principles of a transformer and the affect varying load conditions will have on its circuit.
- Describe basic AC circuit principles.



# Electrical Schematic Reading for HVAC

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**Date:** Wednesday, October 13, 2010

**Time:** 8-4:30 PM

**Instructor:** Elmer Franklin

**Cost:** \$300.00 per student (organizations that send 3 or more may register at \$275 per student)

**Description:** This course promotes the concept of troubleshooting and repair of systems using schematics and wiring diagrams. Attendees will participate in the recognition of components and circuits including diodes, capacitors, transformers, relays and more. The latest in ANSI diagrams will be discussed, including ladders, logic, keys and legends. Circuit board technology in troubleshooting the system will also be reviewed. The course has 3 lab exercises covering using a schematic to identify faulty components, converting a line diagram to a schematic and making a schematic by tracing the system wires.

**Course Objectives:**

- Briefly review basic electric circuit terms, components and operation, including the switch arrangements, transformers, circuit breaker panels, relays, motor starters and thermostats.
- Describe the pictorial, line and schematic diagrams and identify their usefulness.
- Identify common symbols, describe the use of a legend and sequence-of-operation, and describe the operating sequence using a schematic wiring diagram.
- Learn basic troubleshooting procedures to successfully isolate circuit problems using a refrigeration schematic wiring diagram.
- Understand how to use a schematic to name various components on a circuit board.
- Draw a line diagram for a piece of equipment and draw a schematic diagram from a line diagram.
- Describe and check the operation of a Honeywell W973 electronic control system.
- Describe the proper procedure for checking solid-state diodes, SCRs and triacs.
- Use the road mapping process and other means to simplify a schematic.
- Interpret drawings for a large roof top unit with electronic circuit boards and the ability to be accessed by a DDC system.

## Air Conditioning Clinic Series - Spring 2011

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The A/C Clinic is designed to provide students with an overall HVAC Systems experience. Classes begin with basic concepts and advance into theory, system design and mechanical information. Students can choose to take individual classes or all 13 at a discounted rate. Course fees include meals and materials.

Register for all 13 Classes - \$2400.00 per student

Take Individual Classes - \$220.00 per student/ per class

Class Location: All classes will be held at Damuth Trane, 1100 Cavalier Blvd., Chesapeake, VA

**Class Time:** 8-11:30 AM each day

**Module #1 - Introduction to HVAC Systems**

Date: Tuesday, April 5, 2011

Description: This class will prepare students for the entire A/C Clinic by introducing them to various topics regarding HVAC Systems. Topics include:

- Dissecting HVAC Systems
- Overview of components for different system loops such as refrigeration, chilled water, heat rejection and controls.
- Overview of Direct Expansion (DX) vs. Chilled water systems
- Learning about the different system types
- Factors that affect the selection of an HVAC system

**Module #2 - Refrigeration Cycle**

Date: Thursday, April 7, 2011

Description: The Refrigeration cycle will review the basics of heat and refrigeration including definitions and principles of each topic. This section will also review refrigerants, the effects of transferring heat, latent heat and sensible heat.

**Module #3 - Refrigeration System Components**

Date: Tuesday, April 12, 2011

Description: Students will go into detail about each of the components that are included in the refrigeration system. This overview will include an inside look into condensers, evaporators, expansion devices and other accessories such as the solenoid valve, liquid-line filter drier, moisture indicating sight glass, etc.

**Module #4 - Refrigeration Compressors**

Date: Thursday, April 14, 2011

Description: This course will focus on the compressor and how it functions within a HVAC system.

Topics will include:

- Compressor types
- Compressor Capacity Control
- System level control
- Preventing evaporator freeze-up

### **Module #5 - Psychrometry**

Date: Tuesday, April 19, 2010

Description: This will be a detailed session that begins with an overview of the psychrometric chart, properties of air, relative humidity, sensible heat and relative humidity curves. The course then delves into air mixtures, sensible heat ratios, heat & moisture transfer. In addition, the class will review air quantity and how to determine tons of refrigeration. The course ends with going through a psychrometric analysis of a building.

### **Module #6 - Cooling & Heating Load Estimation**

Date: Thursday, April 21, 2011

Description: This seminar will begin with a review of heat transfer and heat transfer methods along with factors that can affect human comfort within a building. The class will then review factors to consider for cooling load estimation such as U-factors, shading, sunlit surfaces, etc. Students will then use formulas to compute cooling load. The third portion of the class will focus on determining heat load and psychrometric analyses. The last portion of the class will focus on computerized heat load analysis.

### **Module #7 - Helical Rotary Water & Centrifugal Chillers**

Date: Tuesday, April 26, 2011

Description: This class will focus on Centrifugal and Helical-Rotary Chillers and their components. Students will review the refrigeration cycle as it pertains to each equipment type, the compressor capacity control, maintenance considerations as well as application considerations.

### **Module #8 - Chilled Water Systems**

Date: Thursday, April 28, 2011

Description: This class will include an overview of the types of chillers and compressors used in various chilled water systems. Students will review variable speed drives and condenser types, as well as, compare air-cooled and water-cooled chillers. Students will gain an understanding of the components to consider when designing a chilled water system. In addition they will also learn topics such as load terminal control options, valve control, damper control and the different types of systems such as single chiller vs. multiple chiller systems. There will also be a section on production and distribution loops as well as pump design.

### **Module #9 - Fundamentals of HVAC Acoustics**

Date: Tuesday, May 3, 2011

Description: The acoustics course will begin with a review of the fundamentals of sound which will include everything from what creates sound to sound power and pressure, decibels, the equation for sound power and the equation for sound pressure. The course will move on to in depth discussions related to sound perception & rating methods, acoustical analysis and equipment sound rating.

### **Module #10 - VAV Systems**

Date: Thursday, May 5, 2011

Description: Students will receive a proper definition of Variable Air Volume and they will learn about the different types and considerations of VAV systems. The course will also discuss components of a VAV system, system configurations, fan modulation, and application considerations.

### **Module #11 - HVAC Fans**

Date: Tuesday, May 10, 2011

Description: This class will review the different types of fans such as centrifugal and axial. Elements of fan performance will also be included. Students will review fan capacity control and application considerations.

### **Module #12 - Water Source Heat Pumps**

Date: Thursday, May 12, 2011

Description: This module will begin with a review of the heat pump and move into what a water source heat pump system consists of and the benefits and issues that come along with it. Students will get a look at the components of a water source heat pump system and see different system configurations. In addition, the course will review maintenance considerations along with application considerations for a water source heat pump system.

### **Module #13 - HVAC Controls**

Date: Tuesday, May 17, 2011

Description: This class is designed to give students an overview of how HVAC controls can compliment a system and optimize it's performance. Students will learn the fundamentals of controls terminology, as well as, the basics of how controls work by starting at unit-level controls and moving up to building management. Other topics will include:

- User interface
- Scheduling
- Alarms & Diagnostics
- Interoperability

*Each module of the Air Conditioning Clinic qualifies for 3.5 CEUs for Virginia Professional Engineer's Licenses.*

# Registration Form

All classes listed below will be held at:

Damuth Trane

1100 Cavalier Blvd.

Chesapeake, VA 23323

For questions please call Amanda Elliott at 757-558-3304 or send an email to aelliott@trane.com.



To register for a class simply complete this form and fax it to Amanda Elliott at 757-558-9715. Or you can register online at [www.damuth.com](http://www.damuth.com). Copies may be made of this form.

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ FAX: \_\_\_\_\_ Email: \_\_\_\_\_

## Geothermal Technology Training - \$250.00 per student (register 3 or more students at \$200 per student) - 8/31/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Refrigeration Compressors - \$250.00 per student (register 3 or more students at \$200 per student) - 9/1/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Boilers - \$250.00 per student (register 3 or more students at \$200 per student) - 9/2/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Tracer Summit Training (Entry Level, Intermediate, Advanced) - \$200.00 per student/ per day or register for all three days at \$525.00 per student - 10/5-7/2010

Please register me for: **Entry Level, Intermediate, Advanced OR ALL THREE DAYS** - Please circle the appropriate choice(s)

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Refrigeration Blend & Safe Use of R410A - \$175.00 per student (register 3 or more students at \$125.00 per student) - 10/11/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Electrical Troubleshooting - \$300.00 per student (register 3 or more students at \$275.00 per student) - 10/12/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Electrical Schematic Reading for HVAC - \$300.00 per student (register 3 or more students at \$275.00 per student) - 10/13/2010

# of attendees from your organization: \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Total Amount

Names of other attendees: \_\_\_\_\_

## Air Conditioning Clinic - Spring 2011 - \$225 per class or register for all 13 modules for only \$2400.00

Please circle the modules you'd like to attend:

- Introduction to HVAC Systems - 4/5/2011
- Refrigeration Cycle - 4/7/2011
- Refrigeration System Components - 4/12/2011
- Refrigeration Compressors - 4/14/2011
- Psychrometry - 4/19/2011
- Cooling & Heating Load Estimation - 4/21/2011
- Helical Rotary Water & Centrifugal Chillers - 4/26/2011
- Chilled Water Systems - 4/28/2011
- Fundamentals of HVAC Acoustics - 5/3/2011
- VAV Systems - 5/5/2011
- HVAC Fans - 5/10/2011
- Water Source Heat Pumps - 5/12/2011
- HVAC Controls - 5/17/2011
- **Please register me for all 13 modules**

# of attendees from your organization: \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ Total Amount

You must log on to [www.usgbc.org](http://www.usgbc.org) to register for either LEED Core Concepts & Strategies OR the LEED BD+C 301: Implementing the Building Design + Construction LEED Rating System Courses. Registrations cannot be taken through Damuth Trane.

Total Billing Amount for Training classes:

Registrations can also be made online at [www.damuth.com](http://www.damuth.com).

Payment information:

P.O. #: \_\_\_\_\_

If paying by credit card please write the credit card number: \_\_\_\_\_

Credit card type: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Name as it appears on the card: \_\_\_\_\_