

# 2017 TECHNICAL TRAINING *Schedule*

## TRAINING INFORMATION

We are an approved Training Agency of the Ohio Construction Industry Licensing Board (OCILB). All of our Technical Training Courses in this brochure are approved for 8 Continuing Education Units (CEUs) by the OCILB.

All courses start at 8:30 AM and end at 5:00 PM.

*Breakfast, lunch and course materials will be provided.*

## TRAINING SCHEDULE

### SPRING 2017

Monday, February 06, 2017

**Basic Combustion**

Tuesday, February 07, 2017

**Cooling Towers & Water Treatment**

Wednesday, February 08, 2017

**Pump Basics**

Thursday, February 09, 2017

**Hydronics**

Tuesday, April 18, 2017

**HVAC Compressors for Commercial Application**

Wednesday, April 19, 2017

**Trane Intellipaks I & II**

Thursday, April 20, 2017

**Electricity for HVAC & Buildings**

Friday, April 21, 2017

**Schematics & Wiring Diagram**

### FALL 2017

Monday, October 23, 2017

**Variable Air Volume**

Tuesday, October 24, 2017

**Variable Frequency Drives**

Wednesday, October 25, 2017

**Boiler Operations & Maintenance**

Thursday, October 26, 2017

**Heat Pumps / WSHP / Geothermal**

Monday, November 06, 2017

**Voyager & Precedent Rooftop Units**

Tuesday, November 07, 2017

**Variable Refrigerant Flow**

# 2017 TECHNICAL TRAINING

## SPRING SCHEDULE

### FEB 06 · BASIC COMBUSTION

This course focuses on the basic principles of gases, fuels, burners and the overall combustion process. Students will explore the concept of mixtures and classifications, and learn how to tune systems for the highest efficiency. Upon completion, students will have a better understanding of how to improve their burner's overall performance.

### FEB 07 · COOLING TOWERS & WATER TREATMENT

This course provides an extensive exploration of cooling towers and its functions. Students will examine cooling tower designs, components, installations, operations and maintenance. In addition, a review and discussion will be conducted on both open and closed circuit designs. Active participants will also have the opportunity to develop a comprehensive maintenance program for towers.

### FEB 08 · PUMP BASICS

This course is designed to familiarize students with the basics and build to provide a full understanding of pump applications and the efficiency of heat pump systems. The lesson focuses on exploration of pump types, installation, selection, as well as service and maintenance. Students will look at position, placement and piping and will learn to calculate the resistance and capacity selections. Challenges of variable frequency drives, fluid issues and the velocity response will also be explored.

### FEB 09 · HYDRONICS

This course establishes a foundation in hydronic concepts and its application. Students will examine all systems associated with water loops, types, classifications as well as piping of the system. There will be a focus on single and dual pipe systems, direct and reverse return piping and loops. This discussion also looks at pump systems, water balancing, treatment and expansion.

### APR 18 · HVAC COMPRESSORS FOR COMMERCIAL APPLICATIONS

This course is designed to acquaint students with the types of compressors used in HVAC systems. Students will examine operation and support concepts, operating requirements associated with suction, as well as compression and discharge of each type. There will be a heavy focus on the installation, power support, oil, structure, lubrication and troubleshooting techniques.

### APR 19 · TRANE INTELLIPAKS I & II

This course will explore the latest rooftop units in the Trane family and will illustrate installation, starting up, setting up, troubleshooting and maintaining Intellipak units. There will be a strong focus on what the Intellipak can monitor and control and how the Intellipak I and the Intellipak II compare to the R22 machines with the latest R410 versions.

### APR 20 · ELECTRICITY FOR HVAC & BUILDINGS

This course provides a comprehensive study on the applications of electricity in buildings. Students will review the principles of electricity, including electrical characteristics and troubleshooting. Other topics that will be discussed include: motors, diagrams, voltage issues, balances, HVAC systems electrical support, power distribution and more.

### APR 21 · SCHEMATICS & WIRING DIAGRAMS

This course introduces the concept of schematics and wiring diagrams using the universal step by step approach and symbol identification techniques. Students will participate in group discussion covering topics such as electrical accessories, the latest ANSI diagram and how to develop troubleshooting techniques from diagrams.

THE 2017 FALL SCHEDULE CAN BE FOUND ON THE  
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## FALL SCHEDULE

### **OCT 23 • VARIABLE AIR VOLUME**

This course looks at building and VAV selection, as well as the rooftop source and the marriage to the VAV network. Students will learn about what controls VAV, VAV setup, boxes, actuators, controls, duct work, sensors and more. In addition, this course will also cover Trane VariTrane, the VariTrac systems and how to troubleshoot the VAV network.

### **OCT 24 • VARIABLE FREQUENCY DRIVES**

This course presents students with the basic foundation and application of variable frequency drives and the energy savings associated with drives. Students will review and discuss the equipment requirements that take priority over drives. Upon completion, students will have a better understanding of the dilemmas of drives, energy relationships and cooling requirements.

### **OCT 25 • BOILER OPERATIONS & MAINTENANCE**

This course is designed to look at externally fired devices, installation and components. Students will examine operation passes, fire tubes, atomization, fuel lines, tubes, stacks, smokeboxes, burners and more. In addition, this course will also cover make-up water and associate water treatment, compare hot water and steam boilers. Topics covered will enable students to build a maintenance program for their own boiler and building support.

### **OCT 26 • HEAT PUMPS / WSHP / GEOTHERMAL**

This course provides an insight to the principles of heat pumps for commercial and residential applications, components and operations. This course will also cover WSHPs and their zone marriage to smaller spaces, individual comfort requirements, boiler and cooling tower connections, installation, as well as maintenance and service. In addition, students will examine geothermal technology, the future of larger applications and the support to energy conservation and efficiency with the use of underground coils.

### **NOV 6 • VOYAGER & PRECEDENT ROOFTOP UNITS**

This course is designed to familiarize students with the principles of the Trane multipurpose rooftop unit and how the Voyager meets the requirements. Students will learn about the Trane Voyager I, II and III, each student will receive a copy of the Voyager controls book and understand its use. In addition, the internal operations of the Voyager and the design, operation and maintenance of the smaller Trane rooftop system, Precedent will be covered.

### **NOV 7 • VARIABLE REFRIGERANT FLOW**

This course focuses on the concept and fundamentals of variable refrigerant flow. Students will learn the characteristics, advantages and benefits of these type of systems, when these systems should be applied, as well as how to control, maintain and service the entire system in both cooling and heating modes.

\*Please note that this program is not manufacturers specific.

## **INSTRUCTOR QUALIFICATIONS**

### ***Nelson B. Warthan***

Nelson has over 44 years of experience as a technician in the HVAC sciences. He is recognized nationally as a trainer in both environmental and regulatory issues, as well as refrigeration.

\*Certificates of Completion will be distributed to all attendees by the instructor before dismissal.

## TRAINING REGISTRATION

### COST

\$325 per student per seat for each individual course

We also offer discount packages which allows you to purchase five or ten seats (*Discounts can be found below*)

### HOW TO REGISTER

Complete and email the following editable form to Morgan Owens at [mowens@whgardiner.com](mailto:mowens@whgardiner.com) or call 440-248-3400

### CANCELLATION / NO SHOW POLICY

You must notify us of your class cancellation seven business days prior to the scheduled class date to avoid being changed for the class. If you cancel less than seven days prior to the class or fail to attend class, you will be charged for the full amount.

#### COMPANY INFORMATION

COMPANY NAME

CONTACT NAME

BILLING ADDRESS

CITY

STATE

ZIP

TELEPHONE

EMAIL ADDRESS

#### REGISTRATION INFORMATION

I WOULD LIKE TO PURCHASE THE FOLLOWING PACKAGE:

INDIVIDUAL SEAT

\$325 / FULL DAY CLASS PLUS 8% TAX

5 SEAT PACKAGE

\$243 / FULL DAY CLASS PLUS 8% TAX

10 SEAT PACKAGE

\$215 / FULL DAY CLASS PLUS 8% TAX

STUDENT NAME

COURSE NAME

STUDENT NAME

COURSE NAME

STUDENT NAME

COURSE NAME

STUDENT NAME

COURSE NAME

STUDENT NAME

COURSE NAME

#### PAYMENT INFORMATION

FORM OF PAYMENT:

CREDIT CARD NUMBER

CHECK NUMBER

PURCHASE ORDER NUMBER

NAME ON CARD

EXPIRATION

CVV NUMBER

PLEASE CONTACT MORGAN OWENS FOR ANY QUESTIONS AND/OR FOR FURTHER ASSISTANCE.