

Building Automation Technician

Course Name	Hours
Year One	
AIRC110 HVACR: Safety, Tools & Methods	49
Electronic Mfg Solutions (EMS) Automated Logic WebCTRL - Operator Training at EMS	40
Hours:	89
AIRC115 HVACR: Fundamentals of Refrigeration	49
ELEI101: Basic Electricity	49
OSHA.com 10-hour General Industry Training Course	10
Hours:	108
Hours year 1:	197
Year Two	
AIRC 205 - Heating Systems	49
AIRC 210 - Comfort Cooling Systems	49
Hours:	98
EMS, Automated Logic WebCTRL - Operator Training II at EMS	40
AIRC 212 - Energy Control Strategies	49
Hours:	89
Hours year 2:	187
Year Three	
ELEI 201 - Advanced HVAC Electricity	49
AIRC 222 - Commercial Refrigeration Systems	49
Hours:	98
AIRC 224 - Commercial Control Systems	49
ABC Baltimore, Construction Quality Management at ABC Baltimore	8
EMS, Automated Logic WebCTRL - Point Wiring & Termination at EMS	40
Hours:	97
Hours year 3:	195
Year Four	
AIRC 230 - Alternative & Renewable Energy Sources	49
Carrier, SER 120 - Centrifugal Compressor Fundamentals at Carrier	28
NCI Building Systems - Air Balance Fundamentals at NCI	40
Hours:	117
Carrier, SER 270 - Series Screw & Scroll Chillers at Carrier	22
Carrier, SER 275 - 23XRV Screw Chiller at Carrier	16
American Society for Healthcare Engineering (ASHE), 170 at ASHE	24
Hours:	62
Hours year 4:	179
Total Classroom Hours:	758

AIRC 110 -HVAC Safety, Tools and Methods

3 credits

Explores the tools used in the HVACR trade and how to accomplish basic tasks. The course highlights construction of fittings made of sheet metal and glass duct board for air duct systems. Safe use of tools and safe procedures for soldering and brazing is emphasized. Course offered fall, spring, and may be offered during additional sessions.



2134 Espey Court, Suite 9
Crofton, MD 21114

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(410) 793-0555

WebCTRL Operator Training

Course Description: 40 hours

Operator Training is offered to the individual who has little or no experience using WebCTRL and needs to develop all necessary skills to operate and monitor a WebCTRL system.

WebCTRL Operator Training will be taught in the Windows environment using the latest version of WebCTRL and multiple browsers (Chrome, Firefox, Internet Explorer). Therefore, it is required that the attendees have some experience in Windows. The attendee does not need to be an expert, but a basic understanding and ability to maneuver around in Windows is a must.

By the end of the three-day course, the attendee will be able to use WebCTRL to successfully:

- Log on to the system
- Navigate and monitor the buildings systems and equipment
- Enter and modify schedules
- Change setpoints
- Monitor and receive alarms
- View trends

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AIRC 115 –Fundamentals of Refrigeration

3 credits

Introduces the compression refrigeration cycle, common refrigerants and their applications, and the theory of heat transfer as related to the refrigeration process. Teaches how to evaluate system performance and how to use tools and equipment for service and installation procedures such as charging, evacuating, and leak detection. Course offered fall, spring, and may be offered during additional sessions.

ELEI 101 –Basic HVAC Electricity

4 credits

Discusses A.C. and D.C. circuit fundamentals. Discusses basic wiring and construction principles, commercial and industrial wiring, residential wiring, the purpose and use of the National Electrical Code, and the Hows and Whys of basic wiring and construction. Course offered fall, spring, and may be offered during additional sessions.



Online OSHA Training

OSHA.COM IS A PRIVATELY OWNED WEBSITE THAT IS NOT AFFILIATED WITH ANY GOVERNMENT AGENCY.

OSHA Online Training 10-hour General Industry Training Course

Includes:

Intro to OSHA and the OSH Act; Walking & Working Surfaces; Emergency Action Plan; Hazardous Materials; Personal Protective Equipment; Machine Guarding Safety; Electrical Safety; Hazard Communication; Hazardous Substance & Industrial Hygiene; Safety and Health Program

Final Exam

AIRC 205 –Heating Systems

3 credits

Studies the construction and operation of gas fired, oil fired, and electric forced air heating equipment (and other related systems as time allows); introduces procedures for installing, testing, and adjusting and maintaining heating equipment. Course offered fall, spring, and may be offered during additional sessions

AIRC 210 –Comfort Cooling Systems

3 credits

Applies the theory and principles of refrigeration to comfort cooling and explains the use of electric heat pumps in residential and light commercial applications. Describes the regulations and procedures that apply to refrigerant recovery, recycling, and reclaiming and offers hands-on laboratory work in recovery and troubleshooting. Course offered fall, spring, and may be offered during additional sessions

AIRC 212 –Energy Control Strategies

3 credits

Addresses all devices that are used to regulate energy use in buildings: from pneumatic to electric to electronic: from manual to automatic; from simple switches to microprocessors. An emphasis is placed on identifying and solving control calibration problems and improving energy efficiency through redesign and energy control strategies. Courses offered less than once a year.



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WebCTRL Advanced Engineering Training

Course Description:

Advanced Engineering Training is offered to the individual who has experience using WebCTRL and wishes to learn how to install and configure a WebCTRL system. Advanced students will engineer a system from scratch using SiteBuilder (Database), Eikon Logicbuilder (Control Logic) and ViewBuilder (Graphics) for WebCTRL.

WebCTRL Advanced Engineering Training will be taught in the Windows environment using the latest version of WebCTRL and multiple browsers (Chrome, Firefox, Internet Explorer). Therefore, it is required that the attendees have some experience in Windows. The attendee does not need to be an expert, but a basic understanding and ability to maneuver around in Windows is a must.

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ELEI 201 –Advanced HVAC Electricity

3 credits

Explores motors, controls, and other electrical devices and interpretation of more complex electrical schematic diagrams for a variety of applications. Two hours of lecture and Two hours of lab a week, one semester. Course offered fall, spring, and may be offered during additional sessions.

AIRC 222 –Commercial Refrigeration Systems

3 credits

Investigates the methods and procedures used to analyze and diagnose problems with ice machines, reach-in coolers and freezers, and walk-in coolers and freezers. Emphasis is placed on light commercial type equipment. Students practice diagnostics through simulation and hands-on practice. Course offered once a year (fall or spring).

AIRC 224-Commercial Control Systems

3 credits

Incorporates both theory and hands-on learning in the areas of electronic controls, pneumatic controls and direct digital control (DDC) systems as each applies to a Heating, Ventilating and Air Conditions (HVAC) system. Course work will center on system components, writing diagrams, calibration and sequences of operation, problem analysis and troubleshooting and installation methods. Course offered fall, spring, and may be offered during additional sessions.



Construction Quality Management (CQM) for Contractors 8 hours

The course offers prospective QC Managers/ Administrators the opportunity to satisfy the CQM -C training requirements specified in most USACE and NAVFAC construction contracts. This course must be taken and the final test must be passed by any person aspiring to be the QC Manager/Administrator or alternate. The course must be taken within 45 calendar days of the award of a construction contract. The Contractors Quality Control (CQC) requirements and the Governments Quality Assurance (QA) roles are reviewed. A course certificate will be awarded to those who satisfactorily complete the training and pass the final exam. The certificate is valid for a five year period from the date of the class. The registration fee includes all course material, continental breakfast, lunch and refreshments.



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Point Wiring and Termination

Course Description:

Point Wiring and Termination is intended for installers and building maintenance staff. Students will learn how to correctly terminate power trunks, communications trunks, and all typical I/O points. Students will perform hands on labs for all topics with instructor guidance. Upon completion, students will have basic knowledge to install or replace common BAS components such as ZN controllers, valve and damper actuators, and analog sensors.

Topics Include:

- Ethernet Wiring
- Arcnet Wiring Rules
- Power Trunk wiring & VA requirements
- Digital Inputs
- Digital Outputs
- Universal Outputs
- Analog Outputs
- Analog Inputs (2, 3, & 4 wire devices)
- Rnet Sensors

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AIRC 230 –Alternative and Renewable Energy Sources

3 credits

Provides a comprehensive overview of renewable energies as applied to the HVAC Industry. Topics to include Solar PV. Solar HW. Geothermal HP, wind and other related evolving technologies. Discussion covers the principles of solar home design for both heating and cooling for new and existing construction. Courses offered once a year (fall or spring).



SER120 - Centrifugal Compressor Fundamentals

Class Description



Centrifugal chillers represent a significant HVAC investment for the building owner and each type of machine requires specific operating, servicing and maintenance practices to protect the investment. This course is intended for service technicians and operators of Carrier 19 series centrifugal chillers. The course covers fundamental principles of centrifugal chillers with in depth coverage of the operation and service techniques associated with most Carrier centrifugal chillers produced over the last 30 years. Carrier chiller models covered include 19D low pressure chillers and 19E,F and 19XR, 19XRV high pressure chillers. Participants learn how to operate, maintain, troubleshoot, and service both the low-and high-pressure machines (including PIC controls). Studies include: centrifugal refrigeration cycles, compressor theory, lubrication cycles, purge operation, refrigerants, heat exchangers, and heat transfer. The course also covers troubleshooting techniques and equipment needed to: record and analyze machine temperatures and pressures; determine performance using heat exchanger approaches; waterside flow rate analysis; maintenance requirements; and logging machine data. This course is mostly classroom instruction and includes numerous exercises using the classroom information to analyze performance. Successful completion of this course is required in order to attend the SER 130 Centrifugal Disassembly and Reassembly course.



National Balancing Council—Large Commercial Certification Training Program

For contractors that have done limited commercial balancing and would like to improve their commercial balancing skills and take on more work and larger jobs, this NCI week long program is for you. It includes both commercial air diagnostics and hydronic diagnostics and balancing, including commissioning a system. You will also get a limited amount of business advice on developing your commercial balancing business. This 5-day program is presented by the National Balancing Council.



SER270 - 30 Series Screw and Scroll Chiller Class Description

Efficient operation of air and water cooled chiller systems requires a thorough understanding of their operation and service procedures. Many of these chillers use scroll or screw compression technology. In this class the service technician will learn how to best operate, maintain, troubleshoot, and service the complete line of Carrier scroll and screw 30 Series air-cooled and water-cooled chillers from the past 20 years. Models covered include the 30GX/HX, RA/RB/RAP, and XA/XW. Studies include chiller refrigeration cycle, compressor theory, cooler heat transfer, water and air-cooled condensers. You will learn how to analyze performance by recording and analyzing refrigerant and water pressures and temperatures and calculating GPM flows. We also cover refrigerant controls, adjustments, charging, capacity control and capacity testing, and operation and troubleshooting of the electrical system, including timers, temperature controllers, operating and safety controls. This class is mostly done in the classroom however several lab exercises are done using the control simulators allowing students have hands on knowledge of chiller control operation. The skills learned in this class will allow operators to run machines more efficiently and service technicians to reduce service time and callbacks.



Carrier University has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102; (703) 506-3275.



TRAINING PROVIDER

Carrier Technical Training is a NATE authorized training and testing facility.



SER275 - 23XRV Liquid Chiller Screw Chiller Service

Class Description

This course is targeted at service technicians and facility managers who operate or service Carrier model 23XR/XRV water cooled screw chillers. This class will cover the chiller refrigeration cycle, compressor theory, drive theory, cooler heat transfer, and water-cooled condensers. Operation and function of the compressors, muffler, condenser, coolers, economizers, metering devices, oil concentrator and accessories are covered. You will learn how to analyze performance by recording and analyzing refrigerant and water pressures and temperatures. Service technicians will be able to distinguish between chiller and system problems and to quickly diagnose problems using service logs. The class also covers the unit controls and how to set up and adjust the controls for optimum system performance. In addition, recommended pre-start and start-up procedures, operational and field issues will be covered. These compressors have very few tear down procedure these procedures will be covered but are not demonstrated. The class consists of classroom instruction with a number of exercises to develop the skills taught in the class and some lab exercises using control simulators developing a working knowledge of the control system operation.



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ANSI/ASHRAE/ASHE 170

CUSTOMIZED LEARNING. ANYTIME, ANYWHERE.

Although the newest edition of the FGI *Guidelines* was published in 2014, a number of states are still using the 2010 edition. This program is designed to help *Guidelines* users stay in compliance with the 2010 edition and offers 24/7 access to specific topics included in this important document.

Customize your learning experience to suit your needs by choosing from more than 130 educational segments covering specific topics from the 2010 FGI *Guidelines for Design and Construction of Health Care Facilities*. *Guidelines* for Design and Construction of Health Care Facilities *Guidelines* users and enforcers with valuable training and information straight from the experts.

The 2010 *Guidelines* provides minimum program, space, and design requirements for clinical and support areas of hospitals, outpatient facilities, nursing homes, and other long-term care facility types. The document also includes minimum engineering design criteria for plumbing, medical gas, electrical, and HVAC systems. More than 42 state departments of licensure or health currently reference or adopt the *Guidelines*. The 2010 *Guidelines* includes material on acoustics, patient handling and movement (PHAMA), patient safety, bariatric patient care, cancer treatment, and emergency services, and incorporates the 2008 edition of ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities*.