

The HVAC Training Center is proud to announce that we now offer online training. These NATE recognized training courses are perfect for your busy schedule. This means, you can study at your own pace and at any time of the day or night. Spend as much time as needed on a certain page or subject. Any questions for the instructor, just e-mail and you will have an answer within 24 hours. Courses contain 6 modules that cover specific HVACR concepts by incorporating a presentation that utilizes some or all of the following; text reading assignments, web site tours, applied exercises, online quizzes, video clips, animations, images, handouts and module final exams. All courses are 18 State of Alabama and NATE CEUs unless otherwise noted.

Courses – Foundation, Intermediate, Advanced

R - 410A Refrigerant Technology for HVACR Technicians *Special Industry Qualification Course*

This R - 410A Qualification course is designed to familiarize the technician with the differences between R - 22 and R - 410A. Background, regulations, impact on the industry, and application requirements will be presented. The course will also provide the technician with practical knowledge for safe performance of service techniques on systems containing R - 410A. If you understand the parameters of this course and then successfully complete the final examination, you will comply with many equipment manufacturers' policies requiring safety and service "certification" prior to purchasing equipment containing R - 410A refrigerant. Because this course is a special qualifications course, it does not come with an instructor. This course is NATE and Alabama recognized for 10 hours of continuing education units (CEUs) which are applicable to NATE recertification. This course has been approved by International Comfort Products, LLC. Six Modules cover:

- R - 410A Refrigerant Background
- R - 410A Refrigerant Regulatory Requirements
- R - 410A Refrigerant Basics
- R - 410A Refrigerant Safety, Handling, and Service Considerations
- R - 410A System Components, Retrofitting, and Charging
- R - 410A System Troubleshooting

Pricing: \$109.95

101 HVACR Fundamentals *Foundation*

This online course provides an introduction to the HVACR basic fundamentals and terminology. The content of the course is dedicated to applied physics concepts that are utilized in HVACR systems. Subjects include topics on measurements, heat, pressure, gas properties, and air properties. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Introduction to the Industry
- Measurements
- Heat energy

- Pressure
- Gas Works
- Air Works

Pricing: \$190 Mentor Led

102 HVACR Safety *Foundation*

This online course covers the basic safety considerations of the HVACR workplace. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Presentations and coursework are in six modules that cover:

- Labels, Materials Safety Data Sheets, and Safety Training)
- Personal Protective Equipment (PPE)
- Personal Safety in Confined Space and on Ladders
- Fire Extinguishers and Compressed Gasses
- Electrical Lockout / Tag out
- Back Safety, Scaffolds/Lifts, and Fall Protection

Pricing: \$190 Mentor Led

103 HVACR Basic Sheet Metal *Foundation*

This course is designed to assist HVAC Technicians and others involved in the HVAC industry with a basic understanding of sheet metal. Sheet metal work is essential to HVAC work. An HVAC tech doing a furnace change out, for instance, will need to fit the new furnace to the plenum, which may involve designing or building an adapter. The idea of taking a flat piece of metal and forming it into something useful, functional or decorative can be one of the most fascinating aspects of HVAC work. The main topics for the course are:

- Types of Sheet Metal and Their Uses
- Assembling, Connecting, and Fastening Sheet Metal Components
- Sheet Metal Tools and Their Uses
- Sealing, Insulating and Lining Sheet Metal Ductwork
- Introduction to Sheet Metal Duct Layout and Fabrication
- Methods of Layout and Development

Pricing: \$190 Mentor Led

111 HVACR Electrical DC Theory Plus *Foundation*

This online course is an introduction to basic electrical theory such as the electron, Ohms Law, circuit schematic symbols, circuit characteristics and measurements as applied to DC & AC circuits in the HVACR industry. This online course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Introduction to the Industry
- What is Energy
- Atomic Theory
- Basic Circuits
- Parallel Circuits
- Power

Pricing: \$190 Mentor Led

112 HVACR Electrical AC Theory Plus *Intermediate*

An online continuation of the Electrical 111 course, concepts presented and discussed are oriented towards alternating current production and application to devices utilized in HVACR systems. We will cover magnetism, alternating current, two types of loads, capacitors, values of load devices and their calculations, and transformers. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Magnetism
- Alternating current
- Loads, Resistive and Inductive
- Capacitors
- Resistance
- Transformers

Pricing: \$205 Mentor Led

113 HVACR Electrical Common Components *Advanced*

This online course covers common control components found in HVACR systems, a logical continuation of the 112 course. Presentations and examples are given for specific devices and their electrical sequence of operation in normal HVACR applications. The final modules discuss wiring and schematic reading. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. The six modules cover:

- Control Methods, Temperature & Pressure
- Residential Heat / Cool Thermostats @ Low Voltage
- Really Good Relay Stuff
- Contactors go / Starters go with protection
- Power wiring
- Odds and ends around a schematic

Pricing: \$230 Mentor Led

114 HVACR Electrical Motors *Advanced*

This online course is dedicated to common single-phase and small three-phase electric motors. Presentations focus on basic motor theory, common types of motors, starting components and protection devices. We will also develop diagnostic skills for motor troubleshooting and replacement. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Basic Electric Motor Theory
- Open and Hermetic Motors
- Capacitor Motors
- Three-phase Motors
- The Application of Electric Motors
- Diagnosing and Replacing Electric Motors

Pricing: \$230 Mentor Led

121 HVACR Systems Air Properties and Measurement *Intermediate*

This online course is the introduction to HVAC comfort systems. In this course we will discuss heat energy, the conditions of human comfort, the psychrometric chart and plotting various air conditions upon it. We will complete the course by introducing the terms, concepts, measurements, and calculations of moving air. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Heat Energy and Comfort
- Properties of Air
- Psychrometrics
- Total Heat In Air
- Measuring a Heavy Invisible Moving Volume
- Air Flow Measurement

Pricing: \$205 Mentor Led

122 HVACR Systems II, Load Calculations *Advanced*

This online course is all about calculating the heat transfer into or out of a residential structure. The presentations and course work are designed to develop and exercise your ability to perform heat loss and heat gain calculations. The required text is ACCA Manual J 8th Ed AE. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Heat Loads Introduction
- Conduction Loads
- Solar Gain
- Infiltration & Ventilation Loads
- Duct Loads
- Complete Heat Loads

Pricing: \$230 Mentor Led

131 HVACR Oil Heat I *Intermediate*

This online course is designed to introduce the concept of combustion in basic terms. The focus will be on the current direct-vent systems and the traditional high-pressure gun burner. It will prepare technicians to install, maintain, and repair residential and small commercial burner systems up to 400,000 BTUs/hour. We will explore all the mechanical, electrical, and accessory devices commonly found in the modern fuel oil heating systems. With this knowledge, we will build troubleshooting skills and identify applicable codes as they pertain to the installation and use of these systems. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Characteristics of Fuel Oil and Principles of Combustion
- Types and Construction of Oil Burners
- Oil Burner Anatomy (part one)
- Oil Burner Anatomy (part two)
- Fuel Oil Tanks and Piping
- Complete Heating Systems

Pricing: \$205 Mentor Led

132 HVACR Oil Heat II *Advanced*

This course is a continuation Of Oil 131 which covered the basic concepts of Oil Heat. In this course we will offer a review of Basic Electrical Principles that are needed for a technician to effectively diagnose electrical problems in Oil Heat Systems as well as other electrical subjects such as operating, safety and primary controls. Oil tank installation concerns, especially code requirements will be studied. NFPA 31 will be referenced along with the equivalent local code from where a student may live and work. The annual tune up and combustion efficiency will also be part of this course.

- The Oil Burner Circuit
- Control Wiring and Operational Safety Controls

- Primary Controls
 - Oil Tank Installation
 - The Annual Tune Up
 - Combustion Efficiency Testing
- Pricing: \$234 Mentor Led**

133 HVACR Gas Heat I *Intermediate*

This course will provide knowledge and skills towards becoming a highly skilled technician who will install, maintain, and repair residential and small commercial Gas Heat Systems. We will explore all the mechanical, electrical, and accessory devices commonly found in the modern Gas Heating Systems. With this knowledge, we will build troubleshooting skills and identify applicable codes as they pertain to the installation and use of these systems. Also extremely important is the focus on safety for the technician, the building, and its occupants. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Six modules cover:

- Fuel Gas Composition
 - Pressure Regulators, Burners, and Heat Exchangers
 - Standing Pilot Systems
 - Electronic Ignition
 - High Efficiency Furnaces
 - Troubleshooting Gas Burner Systems
- Pricing: \$205 Mentor Led**

135 HVAC/R Heat Pump / Air to Air *Intermediate*

This course is designed for a technician as an introduction to reverse-cycle heat pumps. Content covers the components and operational differences of a heat pump vs. a straight cooling system. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Modules cover:

- The heat pump concept
 - Valving arrangements
 - Control systems
 - Common installation criteria
 - Heat pump service
- Pricing: \$205 Mentor Led**

141 HVACR Refrigeration I *Intermediate*

HVAC/R Refrigeration 141 is designed to provide a thorough examination of the refrigerant circuit as it is applied to both air conditioning and refrigeration purposes, and to provide a practical and systematic method to diagnose problems in the refrigerant circuit. If you understand the parameters governing the operation of the refrigerant circuit, you will be able to diagnose any piece of equipment. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Modules cover:

- Basic Refrigeration Cycle Physics
- Condensation and Condensers
- Expansion and Metering Devices
- Evaporation and Evaporators
- Compression and Compressors

- Measure the Normal Cycle
Pricing: \$205 Mentor Led

142 HVAC/R Refrigeration II *Advanced*

This course is a continuation and the next step above 141 HVAC/R Refrigeration. Presentations will describe the application of common accessories found in a system, piping arrangements, sizing considerations and system operation. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Modules cover:

- Refrigerants
 - Compressor accessories and applications
 - Low side accessories and applications
 - High side accessories and applications
 - Piping system sizing and applications
 - Capacity control methods
- Pricing: \$230 Mentor Led**

151 HVACR Controls I *Intermediate*

This online course is not so “fundamental” but is where you start when just dealing with controls. A good understanding of common HVAC systems is a prerequisite of this course. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Module topics are:

- The Building and HVAC Systems
 - Air Circulation and Air Quality
 - Control System Characteristics
 - Process Characteristics and Control Systems
 - Control System Components
 - Control System Categories
- Pricing: \$205 Mentor Led**

152 HVACR Controls II *Intermediate*

This course is an introduction to the primary concepts that lead to the dominant building controls systems, DDC and all its variants including Energy Management. Module topics are:

- Psychrometrics
 - Pneumatic Control Basics
 - Pneumatic Controls
 - Electric Controls
 - Electronic Controls Fundamentals
 - Microprocessor Based/DDC
- Pricing: \$230 Mentor Led**

153 HVACR Controls III *Advanced*

This course is designed to introduce HVACR Technicians, and others involved in the HVACR industry, to basic networking concepts and terminology. This course will help those desiring to work in the building automation field, to establish a strong foundation of standard network terminology and concepts. The main topics for the course are identified below:

- Introduction to Networks
- OSI and Other Network Models
- Taking It From the Topology
- Stringing It All Together
- Transporting Data
- Network Addressing

Pricing: \$230 Mentor Led

154 HVACR Controls IV *Advanced*

This course is designed to introduce HVACR Technicians, and others involved in the HVACR industry to DDC networking types, concepts, and terminology. The main topics for the course are identified below:

- Control Drawings
- DDC Controller Fundamentals
- DDC Systems Architecture
- BACnet
- Open Systems and LonWorks Platform
- Specifications

Pricing: \$230 Mentor Led

155 HVAC/R Controls Operator Interfaces and Energy Management Strategies *Advanced*

This course is designed to introduce HVAC/R Technicians, and others involved in the HVAC/R industry, to the ways of interacting with building automation systems. They will also learn the basic energy management strategies for several HVAC systems. The students will learn the relationships of GUI's, control drawings, and D.D.C. points. The main topics for the course are identified below:

- Operator Interface Methods
- Scheduling
- Chilled Water System Controls
- Condenser Water Controls
- Hot Water System Controls
- Air Handling Units Controls

Pricing: \$230 Mentor Led

156 HVAC/R Controls Fundamentals of D.D.C. Programming Logic *Advanced*

This course is designed to introduce HVAC/R Technicians and others involved in the HVAC/R industry to the fundamentals of programming logic. The students will learn about logic flow diagrams, and some of the different types of programming found in the industry. The student will also study the programming logic of the systems covered in Controls 155. The main topics for the course are identified below:

- Basic Programming Logic 1
- Basic Programming Logic 2
- Chilled Water Systems Programming
- Condenser Water Systems Programming
- Hot Water Systems Programming
- Air Handling Programming

Pricing: \$230 Mentor Led

161 HVACR Boilers I *Intermediate*

This course is designed to introduce the concepts and terminology of heating and power boilers. The main focus of the course will be on commercial and industrial boilers.

- Boiler Fundamentals
 - Classifying Boilers
 - Combustion
 - The Heat Exchanger
 - Controlling energy Sources
 - Boiler Accidents/Hazards
- Pricing: \$205 Mentor Led**

171 HVACR Boilers Low Pressure License Prep *Intermediate*

This online course is designed to introduce the concepts and terminology of heating and power boilers. The main focus of the course will be on commercial and industrial boilers. The content covers the required knowledge for proper and safe low pressure boiler system operations. Individual Mentored students are enrolled for a 90 day term. The content is covered in the 9 modules outlined below:

- Introduction to the industry
 - Classifying Boilers
 - Combustion
 - The Heat Exchanger
 - Controlling Energy Sources
 - Boiler Accidents / Hazards
 - Pumps
 - Heat Transfer Units
 - System Accessories
- Pricing: \$318 Mentor Led**

191 HVACR Hydronics I *Intermediate*

This is the initial course on hydronic heating systems. This online course begins a series of courses that address hot water heating systems. This course is NATE recognized for 18 hours of continuing education units (CEUs) applicable to NATE recertification. Module topics covered:

- System concept
 - Materials and Tools
 - Boilers
 - Pumps
 - Heat Transfer Units
 - System Accessories
- Pricing: \$205 Mentor Led**

241 Intro to Cooling System Troubleshooting *Advanced*

This course is provided to instruct the entry level HVAC technician in the common service procedures performed on conventional residential/light commercial cooling systems including electrical circuits, mechanical compression refrigeration cycle, necessary components in a cooling system, and more. This course requires a good understanding of the refrigeration cycle before you begin. A prerequisite is to be at least to the knowledge level provided in our 141 HVACR Refrigeration course. This course is NATE recognized for 21 hours of continuing education units (CEUs) applicable to NATE recertification. Not yet approved for Alabama state CEUs. Module topics are:

- System Service Overview
- Service Tools/Equipment, Safety, and Quality
- System Components

- System Air Flow
- System Electrical Troubleshooting Basics
- System Mechanical Troubleshooting Basics

Pricing: \$234

243 HVACR Advanced Troubleshooting *Advanced*

This comprehensive course will help technicians move through a procedure to follow safety guidelines, identify the source of problems in HVACR systems, use diagnostic tools, and to address the problem properly. Often technicians start their investigation with only the customer's call, "It died yesterday!" This course is NATE recognized for 21 hours of continuing education units (CEUs) applicable to NATE recertification. Not yet approved for Alabama State CEUs. The course is divided into 7 modules covering the topics listed below:

- Electrical Troubleshooting
- Advanced Controls Troubleshooting
- Troubleshooting Instrumentation
- Troubleshooting the Air Side of Systems
- Troubleshooting Refrigeration
- Troubleshooting Combustion
- Troubleshooting Hydronics

Pricing: \$273 Mentor Led

Technical Core Assessment (TCA)

This assessment is a series of 13 exams that are designed to assess your knowledge as it relates to our core series of HVACR courses and your readiness for industry certifications such as NATE. Performance on the assessment will determine your individualized learning plan. This is a great way to self assess yourself, new hires, and or existing crew to determine knowledge areas that need improvement. Registration for the TCA does not require you to take all of the assessments. You can take only those that are important to you or all of them. Topics covered in the exam are as follows:

- Safety
- Electrical (1-4, intro-advanced)
- HVAC Physics
- HVAC Air Properties
- Refrigeration Cycle Service & Maintenance
- Air Conditioning Troubleshooting
- Comfort Oil
- Comfort Gas
- Comfort Hydronics
- Comfort Heat Pump Specific

After you complete and submit your exam you will receive a performance report that you can print. This report will show your areas of strength and weakness based on your assessment. Your report will recommend a specific course of action to follow regarding additional study or indicate that you are prepared for your certification exam.

Price \$42

Text Books for Courses	
Course	Text (All available through Campus Store)
Fundamentals 101 & 102 Electrical 111 Electrical 112 Electrical 113 Electrical 114 Systems 121 & 122 Heating Gas 133 & 134 Refrigeration 141 & 142 Hydronics 191	Delmar: Refrigeration and Air Conditioning Technology, 5E (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4
Systems 122 (Required)	ACCA Manual J (AE) ISBN 1-892765-28-4
Heating 131 Oil Heating 132 Oil	NORA Oil Heat Technician's Manual No ISBN
Boilers 161 Boilers 171 (Required)	Low Pressure Boilers, 2nd Edition, Frederick M. Steingress, Daryl R. Walker ISBN 0-8269-4350-0