



MASTER CATALOG 2009

Revised October 20, 2009

This NATE recognized quality online education is perfect for your busy schedule. You can study at your own pace and at any time of the day or night without having to travel to a classroom. Our offerings are listed below by category: Courses, Reviews, NATE Exam Prep Reviews, Technical Core Assessments, and Certificate Programs.

Courses – *Foundation, Intermediate, Advanced, Green*

Courses are open-entry, self-paced, open-exit. You have access to each course for 60 days (unless stated otherwise). Spend as much time as needed on a certain page or subject or move along more quickly. As with "in-class" courses, you have instructor support as well. If you have questions for the instructor, just send an e-mail and you will have an answer within 24 hours. Our course learning modules 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, industry terminology definitions, video clips, animations, images and downloadable/printable handouts. Each module concludes with a 20 question module specific exam and the course concludes with a 25 question comprehensive final exam. A minimum passing score of 75% overall is required for successful completion. All courses are aligned with the National Standards for HVACR education and the Home Performance industry as dictated by numerous industry groups such as ANSI/ACCA Quality Standards, AHRI, BPI, PAHRA, PHCC, RSES, and others. Each course is recognized for NATE CEHs (see each course description) applicable to NATE recertification.

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. However, a complete reference manual is included and is shipped upon enrollment. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 10 hours of continuing education (CEHs) 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Six modules cover:

- Introduction to the Industry
- Measurements
- Heat energy

- Pressure
- Gas Works
- Air Works

102 HVACR Safety

Foundation

This online course covers the basic safety considerations of the HVACR workplace. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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 / Tagout
- Back Safety, Scaffolds/Lifts, and Fall Protection

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. 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

107 GREEN Principles of Building Science

Green

This is the first online course of its kind. It was developed and written in partnership with nationally recognized building science experts from **Advanced Energy** <<http://www.advancedenergy.org/>> of North Carolina and is full of scientific facts, interactive exercises, pictures, videos, graphics, and text. Everything an individual in the building, remodeling, or trade industry needs to know to make buildings perform more efficiently. The PBS course has also been designed to help prepare individuals on the path to various NATE, NARI, BPI, RESNET, and other industry credentials related to green building performance. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is both BPI and NATE recognized for 28 hours of continuing education (CEHs) applicable to NATE and BPI recertification. The Principles of Building Science course contains **nine learning modules covering:**

- House as a System
- Air Flow Basics
- Heat Flow, Insulation & Windows
- Framing & Air Sealing
- Moisture Management
- Conditioning Strategies
- Ventilation
- Combustion Safety
- Indoor Air Quality Basics

At the end of each module is a comprehensive exam of the material covered. In addition every person that completes the Principles of Building Science course successfully will receive a one year subscription (six issues) to **Home Energy Magazine** <<http://www.homeenergy.org/>> in both an online and print version (an \$85.00 retail value). Students also receive a reference book that is provided as a study guide for the course. This course is available on the **GrEEnCollarEdu.net** <<http://www.schoolofgreen.net/>> This course allows 90 days enrollment to complete. Must obtain a 75% or higher to obtain CEH recognition.

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This online course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Six modules cover:

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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Six modules cover:

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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Six modules cover:

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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. Six modules cover:

- The Oil Burner Circuit
- Control Wiring and Operational Safety Controls
- Primary Controls
- Oil Tank Installation
- The Annual Tune Up

- Combustion Efficiency Testing

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

135 HVACR Heat Pump / Air to Air

Intermediate

This course is designed as an introduction to reverse-cycle heat pumps used in residential and light commercial applications. Content covers the components and operational differences of a heat pump vs. a straight air conditioning system; and components, troubleshooting, and solutions. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 21 hours of continuing education (CEHs) applicable to NATE recertification. Modules cover:

- What is a Heat Pump
- Heat Pump Installation and Quality Criteria
- The Heat Pump Cooling Mode
- The Heat Pump Heating Mode
- The Heat Pump Defrost Mode
- Heat Pump Components
- Heat Pump Troubleshooting

141 HVACR Refrigeration I

Intermediate

HVACR 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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

142 HVACR Refrigeration II

Advanced

This course is a continuation and elaboration of HVACR Refrigeration 1. Presentations will describe the application of common accessories found in a system, piping arrangements, sizing considerations and system operation. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) 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

151 Building Automation Systems I (formerly HVACR Controls I)

Intermediate

A good understanding of common HVAC systems is a prerequisite for this course. Building controls are very different from the typical controls found in most residential and commercial systems and equipment.

Technicians should have a sense of what a building complex consists of, what control systems consist of, what control requirements need to be met and what choices are available in building design to meet the needs of the building. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification.

Module topics are:

- Building and HVAC Systems
- Air Circulation and Air Quality
- Control System Characteristics
- Process Characteristics and Control Systems
- Control System Components
- Control System Categories

152 Building Automation Systems II (formerly HVACR Controls II)

Advanced

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Module topics are:

- Psychrometrics
- Pneumatic Control Basics
- Pneumatic Controls
- Electric Controls
- Electronic Controls Fundamentals
- Microprocessor Based/DDC

153 Building Automation Systems DDC Networking I (formerly 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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. 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

154 Building Automation Systems DDC Networking II (formerly HVACR Controls IV)

Advanced

This course is designed to introduce HVACR Technicians, and others involved in the HVACR industry to Direct Digital Controls networking types, concepts, and terminology. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. The main topics for the course are identified below:

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

155 Building Automation Systems GUI Points (formerly HVACR Controls Operator Interfaces and Energy Management Strategies) *Advanced*

This course is designed to introduce HVACR Technicians, and others involved in the HVACR industry, to the common types of interfaces used with DDC networks. The most common web based interface will be simulated and used by the student. Basic energy management strategies for several HVAC systems is also covered. The students will use a Graphic User Interface (GUI) and control drawings to identify hardware and software points on common commercial HVAC equipment. **Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards.** This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. 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

156 Building Automation Systems Basic DDC Programming (formerly HVACR Controls Fundamentals of DDC Programming Logic) *Advanced*

This course is designed to introduce HVACR Technicians and others involved in the HVACR 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 155. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. Modules cover:

- Boiler Fundamentals
- Classifying Boilers
- Combustion
- The Heat Exchanger
- Controlling energy Sources
- Boiler Accidents/Hazards

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) which are applicable to NATE recertification. 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

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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. Module topics covered:

- System concept
- Materials and Tools
- Boilers
- Pumps
- Heat Transfer Units
- System Accessories

241 HVACR 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. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 18 hours of continuing education (CEHs) applicable to NATE recertification. 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

243 HVACR Advanced Troubleshooting (formerly numbered 240)

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!" Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. This course is NATE recognized for 21 hours of continuing education (CEHs) applicable to NATE recertification. 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

301 Performing the Comprehensive Building Assessment

Green Intermediate

Designed to introduce students to the comprehensive building assessment process, this intermediate course is geared toward conducting visual building inspections, performing diagnostic testing, and determining residential building improvement opportunities in the field; then documenting a home's performance, prioritizing improvements, and preparing a work scope that will guide the homeowners decision making process for making the improvements.

Students will start out learning the systems, tools and techniques commonly encountered during visual observations including evaluation of envelope components, mechanical systems and base loads such as appliances and lighting. They will then step into diagnostic testing learning first how to work safely. Students will learn how to set up and use the blower door for building pressurization/depressurization testing; and how to utilize the data obtained in making decisions. Students will learn combustion safety testing (including worst case depressurization, draft and spillage testing), and how to test various appliances for CO including: furnaces, boilers, water heaters and other combustion appliances. Students will also learn basic duct diagnostic testing. Finally, students will be taught how to use assessment information and diagnostic results to develop a work scope which can then be presented to a customer. This course will refer to the BPI Building Analyst as well as to various industry codes and standards. It helps prepare individuals for BPI Building Analyst Certification and NATE HVAC Efficiency Analyst Certification (Senior Level). Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. Both BPI and NATE recognition of continuing education (CEHs) applicable to recertification is pending. This course allows 90 days enrollment to complete. Must obtain a 75% or higher to obtain CEH recognition.

Performing the Comprehensive Building Assessment course contains learning modules covering:

1. Observation Techniques and Data Collection
2. Exterior & Interior Assessment and Building System Analysis
3. Blower Door and Zonal Pressure Diagnostics, Ventilation Rates
4. Combustion Safety Testing and Analysis
5. Duct Diagnostics
6. Work Scope Development and Customer Relations

Recommended Prerequisites: Students should have taken the Principles of Building Science, Principles of Green Building or a similar course, or have a solid understanding of building science concepts and house-as-a-system prior to enrollment.

Recommended Textbook: Residential Energy: Cost Savings and Comfort for Existing Buildings (May 2004) by John Krigger and Chris Dorsi

302 Comprehensive Building Assessment II (in development)

Review Courses

050 HVACR Applied Math Review

Foundation

A course designed to refresh and exercise common math concepts as applied to the HVACR workplace. This course provides demonstrations and exercises of the four basic math functions; addition, subtraction, multiplication and division. Each of the four functions is exercised using HVACR workplace applications. Each of the four math functions are applied to:

- Whole numbers
- Fractions
- Decimals

NATE Exam Prep Review

Each review comes with random selection exams that include immediate feedback. With these exams available on demand, you can continually test yourself and improve the areas that you need most. Instruction aligns with ANSI/ACCA Quality Installation & Maintenance Standards. Online learning tools include:

- * Downloadable study handouts
- * User-friendly navigation
- * Linked resource sites for additional study
- * 30-day access
- * Video clips on key points

NATE Core Service Review

This online review is designed to prepare technicians for the NATE Core Service Certification exam. The review covers in detail the same main topics as the NATE Core Service:

- *HVAC Fundamentals
- *HVAC Air Side Knowledge
- *HVAC Electrical Knowledge

NATE Gas Heating (Air) Service Review

This online review is designed to prepare technicians for the NATE Gas Heating (Air) Service Certification exam at either the Installation or Service level. The review is done in three very comprehensive sections covering:

- * HVAC Electrical Knowledge
- * Gas Heat Specific Knowledge
- * Air Side Knowledge

NATE Air to Air Heat Pump Service Review

This online review is designed to prepare technicians for the NATE Air to Air Heat Pump Service Certification exam at either the Installation or Service level. The review is done in four very comprehensive sections covering:

- * HVAC Electrical Knowledge
- * Air Side Knowledge
- * Refrigeration Cycle Knowledge
- * Heat Pump Specific Knowledge

NATE Oil Heating (Air) Service Review

This online review is designed to prepare technicians for the NATE Oil Heating (Air) Service Certification exam at either the Installation or Service level. The review is done in three very comprehensive sections covering:

- * HVAC Electrical Knowledge
- * Oil Heat Specific Knowledge
- * Air Side Knowledge

NATE Hydronics Oil Service Review

This online review is designed to prepare technicians for the NATE Hydronics Oil Service Certification exam at either the Installation or Service level. The review is done in three very comprehensive sections covering:

- * HVAC Electrical Knowledge
- *Hydronics Knowledge
- *Oil Heat Specific Knowledge

NATE Hydronics Gas Service Review

This online review is designed to prepare technicians for the NATE Hydronics Gas Service Certification exam at either the Installation or Service level. The review is done in three very comprehensive sections covering:

- * HVAC Electrical Knowledge
- *Hydronics Knowledge
- * Gas Heat Specific Knowledge

Technical Core Assessment (TCA)

This is a series of 13 exams that is designed to assess knowledge related to HVACR. The total assessment consists of 270 randomly selected questions. Upon completion of the assessment, the results will be displayed in the grade book. Also, our student support staff will evaluate the results and develop an individual education plan to address areas where more learning is needed. The plan will be emailed to the participant. The core technical knowledge areas cover:

- HVACR Safety
- HVACR Electrical 1
- HVACR Electrical 2
- HVACR Electrical 3
- HVACR Electrical 4
- HVACR Applied Physics
- HVACR Air Properties
- Refrigeration Cycle Service & Maintenance
- Air Conditioning Troubleshooting
- Comfort Oil Heating
- Comfort Gas Heating
- Comfort Hydronic Heating
- Comfort Heat Pump

Certificate Programs Online

HVACR Apprenticeship Program

610 (or more) instructional hours

This is the first online apprenticeship training program in the country – convenient quality education. Courses align with the US Department of Labor Apprenticeship Guidelines and HVACReduction.net is a Registered Apprenticeship Training Provider. This online program is the educational component of registered apprenticeship programs that provide on-the-job training supervised by a qualified journeyman. Many employers find it a valuable way to provide on-the-job training to new employees whether or not it is part of a registered apprenticeship program. All courses are guided by qualified industry experts in a cohort setting. Courses are available on a revolving schedule so students may enter the program at the beginning of any course. We are happy to offer assistance registering your apprenticeship program with our online training in your state, please contact us.

<p>Year 1 (150 hours) Basic Safety (18 hours) Basic Construction Math (12 hours) Basic Hand and Power Tools (6 hours) Intro to Applied Science (24 hours) Energy Sources (12 hours) Intro to Code (12 hours) Customer Service (6 hours) Fuel Piping (30 hours) Venting (30 hours)</p>	<p>Year 2 (150 hours) Intro to Blueprints (24 hours) Appliance Installation (24 hours) Heat Loads (24 hours) Indoor Air Quality (18 hours) Electrical I (24 hours) Electrical II (36 hours)</p>
<p>Year 3 (156 hours) Basic AC & Refrigeration (30 hours) Systems Air Flow & Duct Sizing (30 hours) Introduction to Hydronics (6 hours) Introduction to Service (12 hours) Basic Controls (36 hours) Basic Sheet Metal (42 hours)</p>	<p>Year 4 (156 hours) Testing & Air Balance (12 hours) Control Strategies (6 hours) Advanced Air Conditioning & Heat Pump (42 hours) Advanced Service (24 hours) Systems Integration (12 hours) Code Review (48 hours)</p>

HVACR Core Technician Program

320 (or more) instructional hours

This program is a nationally recognized Certificate program, offered in partnership with over 1,600 colleges and universities across the country. Enroll through a college near you and all your courses are online. An additional benefit to this program is that our partner colleges can work with students who may qualify for financial and/or military educational benefits. This is a comprehensive HVACR training program encompassing heating, ventilation, air conditioning, and refrigeration. It is specifically structured to enrich the skills of installers and technicians who are:

- Just beginning in the HVACR industry
- Continuing education for upgrading knowledge and skills, or
- Preparing for certifications or licenses (NATE or ICE)

The content presented in each course focuses on learning objectives that have been identified by HVAC/R industry groups (ARI, NATE, RSES, ACCA, and PAHRA) as key knowledge for an HVAC/R technician. **The eight courses making up the HVAC Core Technician Program are:**

1. Fundamentals (made up of 101 and 102)
2. Electrical 1 (made up of 111 and 112)
3. Electrical 2 (made up of 113 and 114)
4. Systems 1 (made up of 121 and 122)
5. Refrigeration 1 (made up of 141 and 142)
6. Heating 1 (made up of 131 and 133)
7. Heating 2 (made up of 161 and 191)
8. Heat Pumps & Controls (made up of 135 and 151)

For course descriptions, find the corresponding course number at the beginning of this catalog.

HVACR Service Core Program

160 (or more) instructional hours

The HVAC Service Core program is a comprehensive online HVACR education program encompassing heating, ventilation, air conditioning, and refrigeration. It is specifically structured to prepare technicians to successfully pass the initial NATE Core Service Exam and to enrich the skills of installers and technicians who are:

- Just beginning in the HVACR industry
- Continuing education for upgrading knowledge and skills, or
- Preparing for certifications or licenses (NATE or ICE)

The content presented in each course focuses on learning objectives that have been identified by HVAC/R industry groups (ARI, NATE, RSES, ACCA, and PAHRA) as key knowledge for an HVAC/R technician. This program is offered completely online and consists of one (1) math review and eight (8) courses in a specific educational sequence for the HVAC Service Core Certificate. Even though it is self-paced, students receive a 60 day enrollment for each course. Students are registered for one course at a time. Upon successful completion of each course (a score of 75% or higher), students are registered into the next course and receive a certificate of completion for the completed course. After successful completion of the math review and all eight courses students receive a Certificate of Completion for the Service Core Program. **The courses making up the Service Core Program are:**

- R. 050 Applied Math Review
1. HVACR 101 Fundamentals
2. HVACR 102 Safety
3. HVACR 111 Electrical DC Theory Plus
4. HVACR 112 Electrical AC Theory Plus
5. HVACR 113 Electrical Common Components
6. HVACR 114 Electrical Motors
7. HVACR 121 Systems Properties & Measurement
8. HVACR 141 Refrigeration I

For course descriptions, find the corresponding course number at the beginning of this catalog.

HVACR Workforce Upgrade Program

Instructional hours depend on your individual educational plan

Students begin with the Technical Core Assessment, then receive an individual education plan based on assessment scores. Your plan will show only those courses needed to pass the initial NATE Core Service Exam. This program is designed for:

Existing Employees -- Assess and evaluate aptitude and attitude; and assess technical skills followed by the creation of a customized individual education plan for each employee.

New Employees -- Find, hire and train (on an accelerated basis) applicants that have the aptitude, work ethic and people skills necessary to become excellent technicians.

The program includes:

- Aptitude and Attitude Assessment (all candidates)
- Technical Core Assessment (all candidates--existing or experienced technicians)

Individual Educational Plans may include any number of courses from the following (as assessment scores indicate):

- 050 Math Review
- 101 Fundamentals
- 102 Safety
- 111 Electrical
- 112 Electrical
- 113 Electrical
- 114 Electrical
- 121 Systems
- 141 Refrigeration

We **guarantee** that if the policies and procedures of the **WorkForceUpgrade** Program are followed, all existing and new technicians will become **NATE Certified or your money back!!**

Building Automation Systems Program

108 (or more) instructional hours

The BAS Oline Certificate Program provides entry level knowledge for those aspiring to become Direct Digital Controls (DDC) Technicians. It starts with the fundamentals of building controls and then works through general web based DDC networking knowledge. Next, it is on to control drawing fundamentals and a simulated Graphic User Interface (GUI) used to practice troubleshooting and DDC point identification. Finally, students are introduced to some common types of DDC programming. The last two courses of the program allow students to practice applying DDC technology to common pieces of commercial HVAC equipment. The Courses making up the Building Automation Systems Certificate Program are:

- 151 Building Automation Systems I
- 152 Building Automation Systems II
- 153 Building Automation Systems DDC Networking I
- 154 Building Automation Systems DDC Networking II
- 155 Building Automation Systems GUI Points
- 156 Building automation Systems Basic DDC Programming

For course descriptions, find the corresponding course number at the beginning of this catalog.

GREEN Building Performance Analyst Program

58 (or more) instructional hours

With BPI Certification Option (A blended program of online and face-to-face learning)

Now you can earn your Building Performance Analyst Certification through GreenCollarEdu.net and Building Performance Institute in only six steps:

1. Online Education courses: Principles of Building Science and Comprehensive Building Assessment
2. Acquire your tools: Blower Door, Duct Tightness Tester, Digital Micro manometer, Gas Leak Detector, Ambient CO Meter, Combustion Analyzer with Printer and Case, Pressure Pan, Static Pressure Test Kit, Smoke Pens.
Optional Additional Tools: IR Thermometer, Moisture Meter, Low Flow Balometer, Infrared Camera, Inspection Scope.
3. In-the-Field Training: 3 days in the field with a qualified trainer.
4. Field Training Review: ½ day review in a classroom with a qualified trainer (the morning prior to the exam).
5. BPI Building Analyst Written Exam
6. BPI Building Analyst Field Exam

This blended program was developed and written in partnership with nationally recognized building science experts. The two online courses are full of scientific facts, interactive exercises, pictures, videos, graphics, and text. Also, they are recognized by North American Technician Excellence and Building Performance Institute for 28 continuing education hours each. You'll also receive a book to use as a study guide and a one year subscription to Home Energy Magazine. This program is a great way to compliment and increase your company's GREEN services for your customers and to open new doors of opportunity.

ANSI Quality Standards Program

15 (or more) instructional hours

This program is provided to instruct the professional HVAC technician in the common service procedures performed on conventional residential/light commercial cooling systems. The Quality Standards program is not appropriate for entry level HVAC but designed for the practiced professional in HVAC. This program has several facets and is intended to identify quality knowledgeable technicians or assist technicians to review and gain quality knowledge. HVAC contractors and technicians qualify their knowledge in four critical areas that support the Quality Installation & Maintenance of residential and light commercial air conditioning and air source heat pump systems: Air Flow, Equipment Sizing, Refrigerant Charging, and Duct Sealing.

There are three distinct parts to the program: Quality Assessment, Quality Review, Data Base. Begin with the Quality Assessment or a Quality Review course depending on what the Contractor or Technician chooses. Those that choose the exam and fail are invited to use the Quality Review and retest. Those that wish to review before the exam are offered the Quality Review. A public searchable database is provided to utility clients where customers may search for contractors or technicians qualified to perform work for a number of utility rebate programs.

Assessment:

Contractors and Technicians simply sign up to take the 90 minute, 50 question online QA (Quality Assessment). They must answer 75% of the questions correctly in order to pass. If not, the Quality Review Course is available for a 30 day enrollment.

Review:

The Quality Standards Review is considered a device to cover knowledge that was already known but needs to be revisited to accomplish a task. The Quality Review is rich with industry specific information, divided into five learning modules.

- Module 1 reviews the ANSI/ACCA Quality Standards Overview focusing on design, installation, and service
- Module 2 reviews equipment sizing via Manual J 8AE
- Module 3 reviews air properties and measurement
- Module 4 reviews the refrigeration cycle and servicing
- Module 5 reviews duct sealing practices

Each module includes a random selection exam that can be taken over and over without getting the same selection of questions. This allows self testing of the knowledge gained from the review modules and to prepare for the Quality Assessment.

Database:

Once passed, the name of the technician and/or the name of the contractor's company is entered into a database of "Qualified" contractors and technicians. Customers can search the web-based database to view contractors that have been qualified through the program and provide services subsidized by utility rebates.

Text Books for Courses	
Course	Text (All available through Campus Store)
Fundamentals 101 Safety 102 Sheet Metal 103 Electrical 111 Electrical 112 Electrical 113 Electrical 114 Systems 121 & 122 Heating Gas 133 & 134 Heat Pumps 135 Refrigeration 141 & 142 BAS 151 & 152 Troubleshooting 241 & 243	Delmar: Refrigeration and Air Conditioning Technology, 5 th Edition (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4
Systems 122 (Required)	ACCA Manual J 8AE ISBN 1-892765-28-4
Oil Heating 131 & 132	NORA Oil Heat Technician's Manual (No ISBN)
BAS 153, 154, 155, & 156	The Fundamentals of HVAC Direct Digital Control ISBN 097044711-6
Boilers 161 Boilers 171 (Required)	Low Pressure Boilers, 3rd Edition, Frederick M. Steingress, Daryl R. Walker ISBN 978-0-8269-4358-3
Hydronics 191	Modern Hydronic Heating 2 nd Edition ISBN 0-7668-1637-0
Year 1 Apprentice	-Delmar: Refrigeration and Air Conditioning Technology, 5 th Edition (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4 -International Fuel Gas Codes -International Mechanical Codes -International Residential Codes
Year 2 Apprentice	-Delmar: Refrigeration and Air Conditioning Technology, 5 th Edition (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4 -International Fuel Gas Codes -International Mechanical Codes -International Residential Codes
Year 3 Apprentice	-Delmar: Refrigeration and Air Conditioning Technology, 5 th Edition (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4
Year 4 Apprentice	-Delmar: Refrigeration and Air Conditioning Technology, 5 th Edition (Hardcover), Whitman, Johnson, Tomczyk, ISBN 1-4018-3765-4 -International Fuel Gas Codes -International Mechanical Codes -International Residential Codes
Principles of Building Science 107 R410-A Refrigerant Technology	No Textbook Required-a reference manual is included with the course