

## ADVANCED HVAC TRAINING

# High-Performance HVAC Design and Redesign



*An NCI-trained contractor's approach to heat pump system design from a high-performance perspective using ACCA Manuals J, S, D, and T.*

In this educational experience, HVAC contractors will learn to accurately complete four stages of system design using National Comfort Institute™ (NCI) Principles and Air Conditioning Contractors of America (ACCA®) Manuals J, S, D, and T using the Elite® RHVAC software package for new and existing homes.

This three-day course builds on principles learned in other NCI courses and applies them to the residential system design or redesign processes. NCI uses industry-approved standards for load calculations, equipment selection, duct design and grille and register selection.

# NCI ADVANCED HVAC TRAINING

## A High-Performance HVAC System Starts With the Right Design

### More information:

- Three days of instruction with seven 50-minute learning modules per day
- Includes a live instructor, interactive discussion, power point, written and hands-on exercises
- Includes full access to Elite RHVAC software for use during the class and 30 days beyond
- Course content structured to work interactively with software
- Windows-based laptop computers will be required
- A limited supply of laptops will be made available on a first come, first serve basis
- Receive a printed course manual including outlines, step-by-step procedures, and reference material
- There is no certification or exam included with this course.

### Upon Completion of Training You'll Be Able to:

- Use computer-based software to design and select properly sized heat pumps, ducts, grilles, and registers that conform to NCI performance-based principles to optimize system performance
- Enhance the installed performance of new or existing HVAC systems, including the duct system
- Prepare plans and reports for permit approval by local code enforcement officials

- Determine when to include building testing and upgrades in the project scope of work
- Apply ANSI/ASHRAE 62.2 ventilation standards to the design of new and retrofit systems.

***Individuals successfully completing this course will receive a certificate of completion.***



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## AGENDA

### Day 1

#### Module One - The High-Performance Approach to Mastering Manual J

*Heat loss and gain design principles and how they tie in with other NCI training courses.*

- Prohibited practices
- Data entry for a simple three room house
- Redesign using real-world data in Manual J load calculations
- Introduction to Drawing Board – A CAD approach to heat load design
- Evaluating results of the three-room house
- Extending basic principles to CAD layout of a 2000 square foot home
- Module one recap.

### Day 2

#### Module Two - Right-Sizing Equipment with Manual S

*How to Use Manual J Results to Properly Select the Right Capacity Heat Pump*

- The AHRI myth

- Differentiating between Manual J loads and actual equipment performance
- Equipment extended cooling performance secrets
- How to use manufacturer website equipment calculators
- Using the Extended Performance Interpolation Calculator - reality-based equipment selection
- Correctly sizing equipment with design rules, not rules of thumb
- Module two recap.

### Day 3

#### Module Three - Designing/Redesigning Ducts with Manual D

*Improving duct system performance using software and NCI field duct sizing procedures to specify friction rate and velocity parameters.*

- Friction rate is not static pressure
- 6-inch ducts don't always deliver 100 CFM
- Flex duct fantasies
- Why worry about cheese heads
- Return duct myths
- Module three recap.

#### Module Four - Selecting Performance-Grade Registers and Grilles with Manual T

- Interpreting Manual D results to select replacement registers and grilles that improve performance

# NCI ADVANCED HVAC TRAINING

## Design Your System the Right Way for Your Customers



### Pre-requisite Training:

This three-day training is a stand-alone course that requires basic computer literacy. It is not

necessary to have HVAC field technician skills to participate in the training. It is beneficial to have prior building science training before attempting to master ACCA Manual J with software.

We recommend students to have completed NCI's Airflow Testing and Diagnostic and Duct System Optimization courses.

HVAC contractors, company leaders, technicians, installers, salespeople, and previously NCI-certified personnel would all benefit from this training.

## Who is NCI?

**National Comfort Institute, Inc. (NCI)** is the world leader in HVAC System Performance and Air Balancing training. We created the industry's best practices, processes, and forms and have been teaching them for decades.

What makes NCI's approach different? We show you how to thoroughly test and diagnose the system using practical, easy-to-follow methods so you'll know exactly what to do to provide your customers with optimum comfort and energy efficiency.

NCI coined the phrase "High-Performance HVAC™", a unique approach to managing a contracting business through accountability and measurable results. During the past two decades, NCI has trained and certified more than 30,000 HVAC industry professionals. For more information about NCI, please call 800-633-7058 or visit [www.nationalcomfortinstitute.com](http://www.nationalcomfortinstitute.com).

### Additional Educational Opportunities from NCI:

- Advanced Air & Hydronic Balancing
- Airflow Testing & Diagnostics Implementation
- Commercial HVAC System Performance
- Combustion Performance and CO Safety
- Duct System Optimization
- Residential HVAC System Performance & Air Balancing
- NCI Online University.

**Learn more and register at, [ncilink.com/DesignRedesign](http://ncilink.com/DesignRedesign)**



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