



SPA

COURSES:

Advanced Automatic control
Advanced Hydronics
Air Distribution and Balance
Air Source Heat Pumps
Air-Conditional System Refrigerants and Components
All-Weather Heating Systems
Application of Motors
Automatic Control Components and Applications
Automatic Device Applications
Basic Circuits
Basic Electricity Safety
Basic Math for the Trades
Basic Refrigeration
Calibrating Instruments
Certification Testing
Comfort and Psychrometric
Commercial and Industrial Heating and Air-Conditioning Equipment
Commercial, Packaged Rooftop, Variable Refrigerant Flow, and Variable Air Volume System
Components, Symbols, and Circuitry of Air-Conditioning Wiring Diagrams
Compressors
Condensers
Cooling Towers and Pumps
Domestic Refrigerators and Freezers
Electric Heating Systems
Electric Motors
Electrical Meters
Electrical Motor Components
Electrical Safety
Electrical Simulations Test
Electrical Theory
Electrical vs. Mechanical Problems
Energy Auditing
EPA 608 Study Materials
Evaporators
Expansion Devices
Fasteners
Gas-Fired Heating Systems
General Safety Knowledge
Geothermal Heat Pumps

High Pressure, Low Pressure, and Absorption Chilled-Water Systems
Hydronic Heating Theory
Ice-Making Systems
Indoor Air Quality
Introduction to Automatic Controls
Introduction to HVAC
Ladder Platform Safety
Leak Detection, System Evacuation, and System Cleanup
Motor Controls
Normal Operating Conditions
Oil-Fired Heating Systems
Operation, Maintenance, and Troubleshooting of Chilled-Water Air-Conditioning Systems
Performing a Successful Service Call
Piping Operations
Refrigerant Management Pt 1
Refrigerant Management Pt2
Refrigerant, Installation
Refrigerant Applied to Air-Conditioning
Room Air Conditioners
Series and Parallel Circuits in Depth
Simulations Commercial Air-Conditioning
Simulations Commercial Freezer
Simulations Gas Boiler
Simulations Gas Furnace
Simulations Heat Pump
Simulations Motor Components
Simulations Motors
Simulations Oil Furnace
Simulations Split Residential Air-Conditioning
Simulations wiring Diagrams
Special Refrigeration Applications
Special Refrigeration System components
Supplemental Electrical Safety Material
System Installation and Start-Up
Technician Soft Skills Pt 1
Technician Soft Skills Pt 2
Technician Soft Skills Pt 3
Technician Soft Skills Pt 4
Technician Soft Skills Pt 5
The Customer is Always Right
The Theory of Heat
Tools and Equipment
Troubleshooting
Troubleshooting Basic Controls
Troubleshooting Commercial Refrigeration Systems
Troubleshooting Electric Motors
Troubleshooting with a Multimeter
Understanding Construction Drawings, 7th Edition

CATEGORIES:

1. Air Systems
2. Basic HVAC
3. Controls
4. Electrical
5. Heating
6. HVAC Components
7. Hydronic
8. Installation
9. Motors
10. Piping
11. Refrigeration
12. Safety
13. Soft Skills
14. Troubleshooting

CONCENTRATIONS:

- 1. Air Conditioning – Air to Air**
 - a. Fabricating Copper Tubing
 - b. Installing Condensing Unit
 - c. Installing Packaged Units
 - d. Installing Indoor Equipment
 - e. Evacuation and Charging
 - f. Duct Installation
 - g. Installing Accessories
 - h. Field Wiring
 - i. Start-Up and Checkout
 - j. Refrigerant Circuit Tools
 - k. Recovery/Recycling Machines
 - l. Airflow Measurements
 - m. Planned Maintenance
 - n. Diagnostics
 - o. Overview of Electrical Troubleshooting
 - p. Retrofitting
 - q. Air balance
 - r. Basic HVAC System Analysis
 - s. Analyzing Reported Symptoms in Cooling
 - t. Introduction to Systems
 - u. Duct Systems
 - v. Wiring Layouts
 - w. Components
 - x. Electromechanical Sensing Controls
 - y. Refrigerant Circuit Controls
 - z. Non-Sensing Controls
 - aa. Electronic Controls
 - bb. Air Quality regulations
 - cc. Electrical Code

- dd. Design Considerations – Comfort
- ee. Design Considerations – Res. & Lt. Comm.
- ff. Bids and Proposals

2. Air Distribution – Low Pressure

- a. Installation Certification
 - i. Duct Fabrication
 - ii. Duct Installation
 - iii. System Setup
 - iv. Airflow Measurements
 - v. Basic Air Distribution System Inspection
 - vi. Inspection and Repair of Metal Duct Systems
 - vii. Inspection and Repair Duct board Systems
 - viii. Inspection and Repair of Flexible Duct Systems
 - ix. Inspection and Repair of Grilles and Registers
 - x. Introduction to Electrical Troubleshooting
 - xi. Introduction to Systems
 - xii. Duct Systems
 - xiii. Basic Gas Furnaces
 - xiv. Basic Oil Furnaces
 - xv. Basic Air Conditioning and Heat Pumps
 - xvi. Basic Airflow Principles
 - xvii. Air Quality Regulations
 - xviii. Electrical Code
 - xix. Design Considerations – Comfort
 - xx. Design Considerations – Residential
 - xxi. Design Considerations Components
 - xxii. Design Considerations – Light Commercial
- b. Service Certification
 - i. Duct Fabrication
 - ii. Duct Installation
 - iii. Airflow Measurements
 - iv. Air Balancing
 - v. Basic HVAC System Analysis
 - vi. Analyzing Reported Symptoms in Cooling
 - vii. Planned Maintenance
 - viii. Airflow Measurements
 - ix. Introduction to Basic Systems and Components
 - x. Non-Sensing Controls
 - xi. Duct Systems
 - xii. Basic Gas Furnaces
 - xiii. Basic Oil Furnaces
 - xiv. Basic Air Conditioning and Heat Pumps
 - xv. Air Flow Principles
 - xvi. Electronic Controls
 - xvii. Electromechanical Sensing Controls
 - xviii. Air Quality Regulations
 - xix. Electrical Code
 - xx. Design Considerations – Comfort

- xxi. Design Considerations – Residential
 - xxii. Design Considerations – Components
 - xxiii. Design Considerations – Light Commercial
- c. Mechanical fittings groove piping systems and mechanical press locking systems
 - d. Install fittings
 - e. Solder, braze, and tin fittings and components
 - f. Care and use of oxy-acetylene and air-acetylene torches
 - g. Silver and soft soldering

3. Heating

- a. Hydronics – Oil Service Certification
 - i. Installing Oil Boilers
 - ii. Duct Installation for Hot Water Heating Systems
 - iii. Hydronic Component Installation
 - iv. Installing Accessories
 - v. Start-Up and Checkout
 - vi. Airflow – Ducted Systems with Hot Water Coils
 - vii. Water Measurements
 - viii. Oil Burner Combustion Setup Tools
 - ix. Planned Maintenance
 - x. Diagnostics and Repair
 - xi. Overview of Electrical Troubleshooting
 - xii. Air Balancing for Systems with Hot Water Coils
 - xiii. Water Balancing
 - xiv. Basic HVAC System Analysis
 - xv. Analyzing Reported Symptoms in Heating
 - xvi. Introduction to Basic Systems and Components
 - xvii. Boiler Configurations and Applications
 - xviii. Combustion Process for Oil Boilers
 - xix. Atmospheric Oil Boilers – Components
 - xx. Combustion Air Requirements
 - xxi. Air Distribution for Systems with Hot Water Coils
 - xxii. Hydronic Distribution
 - xxiii. Wiring Layouts
 - xxiv. Electromechanical Sensing Controls
 - xxv. Non-Sensing Controls
 - xxvi. Electronic Controls
 - xxvii. Regulations for Environmental Protection
 - xxviii. Electrical Code
 - xxix. Design Considerations – Comfort
 - xxx. Design Considerations – Oil Boiler Equipment
 - xxxi. Design Considerations – External Components
- b. Hydronics – Gas Service Certification
 - i. Installing Gas boilers
 - ii. Duct Installation for Hot Water Heating Systems
 - iii. Hydronic Component Installation
 - iv. Installing Accessories
 - v. Start-Up and Checkout

- vi. Airflow – Ducted Systems with Hot Water Coils
- vii. Water Measurements
- viii. Planned Maintenance
- ix. Diagnostics and Repair
- x. Overview of Electrical Troubleshooting
- xi. Gas Pressure Measurements and Detection
- xii. Flue Gas Analysis and Leak Detection
- xiii. Air Balancing for Systems with Hot Coils
- xiv. Water Balancing
- xv. Basic HVAC System Analysis
- xvi. Analyzing Reported Symptoms in Heating
- xvii. Introduction to Basic Systems and Components
- xviii. Boiler Configurations and Applications
- xix. Combustion Process for Gas Boiler Systems
- xx. Natural Draft Gas Boiler - Components
- xxi. Combustion Air Requirements
- xxii. Air Distribution for Systems with Hot Water Coils
- xxiii. Hydronic Distribution
- xxiv. Wiring Layouts
- xxv. Natural Draft Gas Boiler – Operation
- xxvi. Induced Draft Non-Condensing – Components
- xxvii. Induced Draft Non-Condensing Operation
- xxviii. Induced Draft Condensing – Components
- xxix. Induced Draft Condensing – Operation
- xxx. Non-Sensing Controls
- xxxi. Ignition Control Systems
- xxxii. Electronic Controls
- xxxiii. Electromechanical Sensing Controls
- xxxiv. Regulations for Environmental Protection
- xxxv. Electrical Code
- xxxvi. Design Considerations – Comfort
- xxxvii. Design Considerations – Gas Boiler Equipment
- xxxviii. Design Considerations – External Components
- c. Warm Air – Gas Installation and Service Certification
 - i. Installing Gas Furnaces
 - ii. Duct Installation
 - iii. Installation Accessories
 - iv. Start-Up and Checkout
 - v. Airflow Measurement
 - vi. Planned Maintenance
 - vii. Diagnostics
 - viii. Overview of Electrical Troubleshooting
 - ix. Gas Pressure Measurements and Detection
 - x. Flue Gas Analysis and Leak Detection
 - xi. Air Balancing
 - xii. Basic HVAC System Analysis
 - xiii. Analyzing Reported Symptoms in Heating
 - xiv. Introduction to Basic Systems and Components
 - xv. Furnace Configurations and Applications

- xvi. Combustion Process for Gas Furnaces
- xvii. Natural Draft Gas Furnace – Components
- xviii. Combustion Air Requirements
- xix. Air Distribution
- xx. Wiring Layouts
- xxi. Natural Gas Furnace – Operation
- xxii. Induced Draft Non-Condensing Components
- xxiii. Induced Draft Non-Condensing – Operation
- xxiv. Induced Draft Condensing – Components
- xxv. Induced Draft Operation
- xxvi. Non-Sensing Controls
- xxvii. Ignition Control Systems
- xxviii. Electronic Controls
- xxix. Electromechanical Sensing Controls
- xxx. Air Quality Regulations
- xxxi. Electrical Code
- xxxii. Design Considerations – Comfort
- xxxiii. Design Considerations – Gas Furnace Equipment
- xxxiv. Design considerations – External Components
- d. Warm Air – Oil Service Certification
 - i. Installing Oil Furnaces
 - ii. Duct Installation
 - iii. Installing Accessories
 - iv. Start-Up and Checkout
 - v. Oil burner Combustion Setup Tools
 - vi. Airflow Measurements
 - vii. Planned Maintenance
 - viii. Diagnostics and Repair
 - ix. Overview of Electrical Troubleshooting
 - x. Air Balancing
 - xi. Basic HVAC System Analysis
 - xii. Analyzing Reported Symptoms in Heating
 - xiii. Introduction to Systems
 - xiv. Furnace Configurations and Applications
 - xv. Combustion Process for Oil Furnaces
 - xvi. Natural Draft Oil Furnace – Components
 - xvii. Combustion Air Requirements
 - xviii. Air Distribution
 - xix. Wiring Layouts
 - xx. Electromechanical Sensing Controls
 - xxi. Non-Sensing Controls
 - xxii. Electronic Controls
 - xxiii. Air Quality Regulations
 - xxiv. Electrical Code
 - xxv. Design Considerations – Comfort
 - xxvi. Design Considerations – Oil Furnace Equipment
 - xxvii. Design considerations – External Components
- e. Reverse Cycle Air to Air Installation and Service Certification
 - i. Fabricating Copper Tubing

- ii. Installing Outdoor Units
- iii. Installing Packaged Units
- iv. Installing indoor Equipment
- v. Evacuation and Charging
- vi. Duct Installation
- vii. Installing Accessories
- viii. Field Wiring
- ix. Start-Up and Checkout
- x. Refrigerant Circuit Tools
- xi. Recovery and Recycling Machines
- xii. Airflow Measurements
- xiii. Planned Maintenance
- xiv. Diagnostics
- xv. Overview of Electrical Troubleshooting
- xvi. Retrofitting
- xvii. Air Balancing
- xviii. Basic HVAC System Analysis
- xix. Analyzing Reported Symptoms in Cooling
- xx. Analyzing Reported Symptoms in Heating
- xxi. Introduction to Systems
- xxii. Duct Systems
- xxiii. Wiring Layouts
- xxiv. Components
- xxv. Electromechanical Sensing Controls
- xxvi. Refrigerant Circuit Controls
- xxvii. Non-Sensing Controls
- xxviii. Electronic Controls
- xxix. Air Quality Regulations
- xxx. Electrical Code
- xxxi. Design Considerations – Comfort
- xxxii. Design Considerations – Res & Lt Comm.
- xxxiii. Design Considerations – Components
- xxxiv. Bids and Proposals
- xxxv. Design Considerations – Dual Fuel Kids

4. HVAC Efficiency Senior Certification

- a. Customer Survey
- b. Zoning
- c. Infiltration
- d. Ventilation
- e. Heat Loss
- f. Heat Gain
- g. Duct Loads
- h. Regulations
- i. Design Considerations – Comfort
- j. Design Considerations – Residential
- k. Design Considerations – Components
- l. Industry Standards
- m. Design Considerations – Light

- n. Efficiency
- o. Capacity Controls
- p. Low Ambient Controls
- q. Systems and Components
- r. Duct Systems
- s. Duct Fabrication
- t. Duct Installation
- u. Airflow Principles
- v. Airflow Measurements
- w. Air Balancing
- x. HVAC System Analysis
- y. Analyzing Reported Symptoms in Cooling
- z. Analyzing Reported Symptoms in Heating
- aa. Heating components
- bb. Gas Heating
- cc. Oil Heating
- dd. Air Conditioning and Heat Pumps
- ee. Electronic Controls
- ff. Electromechanical Sensing Controls
- gg. Designing for Acceptable IAQ/IEQ
- hh. Installing IAQ/IEQ Systems
- ii. Operating and Maintaining IAQ/IEQ Systems
- jj. IAQ/IEQ Control Services
- kk. Planned Maintenance

5. Refrigeration Service Certification

- a. Lighter Commercial
 - i. Fabricating Copper Tubing
 - ii. Installing Packaged Refrigeration Unit
 - iii. Installing Outdoor Condensing Unit
 - iv. Installing Evaporator Unit
 - v. Evacuation and Charging System
 - vi. Installing Components and Accessories
 - vii. Field Wiring
 - viii. Start-Up and Checkout
 - ix. Refrigerant Circuit Tools
 - x. Recovery and Recycling Machines
 - xi. Airflow Measurements
 - xii. Planned Measurements
 - xiii. Planned Maintenance
 - xiv. Diagnostics
 - xv. Overview of Electrical Troubleshooting
 - xvi. Retrofitting
 - xvii. Basic Refrigeration System Analysis
 - xviii. Analyzing Reported Symptoms in Cooling
 - xix. Introduction to Systems
 - xx. Wiring Layouts
 - xxi. Components
 - xxii. Electromechanical Sensing Controls

- xxiii. Refrigerant Circuit Controls
- xxiv. Electronic Controls
- xxv. EPA Regulations
- xxvi. Electrical Code
- xxvii. Design Considerations – General
- xxviii. Design Considerations – Commercial
- b. Commercial
 - i. Fabricating Copper Tubing
 - ii. Installing Packaged Refrigeration Unit
 - iii. Installing Split Systems
 - iv. Installing Evaporator Unit
 - v. Evacuation and Charging System
 - vi. Installing Components and Accessories
 - vii. Field Wiring
 - viii. Start-Up and Checkout Pre-
 - ix. Refrigerant Circuit Tools
 - x. Recovery and Recycling Machines
 - xi. Airflow Measurements
 - xii. Planned Maintenance
 - xiii. Diagnostics
 - xiv. Overview of Electrical Troubleshooting
 - xv. Retrofitting
 - xvi. Basic Refrigeration System Analysis
 - xvii. Analyzing Reported Symptoms in Cooling
 - xviii. Introduction to Systems
 - xix. Wiring Layouts
 - xx. Components
 - xxi. Electromechanical Sensing Controls
 - xxii. Refrigerant Circuit Controls
 - xxiii. Non-Sensing Controls
 - xxiv. Electronic Controls
 - xxv. EPA Regulations
 - xxvi. Electrical Code
 - xxvii. Design Considerations – General
 - xxviii. Design Considerations – Commercial

COURSE TEXTBOOKS:

- 978-1-337-91382-9- Basic Principles for Construction , 5th Edition
- 978-1-337-79868-6- Understanding Motor Controls
- 978-1-111-31381-4- The Trade Technician’s Soft Skills Manual
- 978-0-357-12227-3– Refrigeration and Air Conditioning Technology 9th MindTap edition
- 978-1-337-27616-0- Delmar Online Training Simulation: HVAC 4.0 , 8th Edition
- 9781305579804 – Refrigeration and A/C Technology 8e MindTap
- 978-1-337-39912-8 Electricity for Refrigeration, Heating, and Air Conditioning, 10th edit
- 978-1-337-91382-9 Residential Construction Academy: Basic Principles for Construction, 5th Edition
- 978-1-4283-3515-8-Modern Hydronic Heating: For Residential and Light Commercial Buildings
- 978-1-337-39912-8- Electricity for Refrigeration, Heating, and Air Conditioning
- 978-1-337-40863-9- Understanding Construction Drawings , 7th Edition