







## BASIC HVACR 4 DAY

**DESCRIPTION:** Class is appropriate for electricians or mechanics who are going to maintain HVACR systems, but who have only limited experience or training in HVACR. Twenty-five (25%) percent of this seminar is "hands on" experience in the laboratory.  
**COST: \$2,070 (LAB AND STUDY MATERIAL INCLUDED)**

- Refrigerant pressure temperature chart analysis
- Basic refrigeration cycle
- Compressors - in mechanical refrigeration systems
- Condensers - construction characteristics and types
- Evaporators - construction
- Refrigerants
- Basic electricity for refrigeration
- Brazing - system assembly, procedure & repair
- Leak detection
- Recovery & charging of systems & other service techniques
- Scheduled maintenance

## EPA CERTIFICATION & REFRIGERATION RECOVERY 1 DAY

**DESCRIPTION:** This seminar in Refrigerant Recovery and Recycling is designed for people who repair, maintain or install equipment that contains or will contain when charged, regulated refrigerants. The proper method of recovery and recycling of these refrigerants is covered using state-of-the-art equipment. Bringing a laptop, tablet, iPad or internet capable device (other than a phone) will allow you to take the exam online. Online allows for immediate results. If only 2 sections are passed, you will have the opportunity to re-test before leaving our facilities. **Bring smart device for test.** We can accommodate the few that do not have access to a device. **Prerequisite:** Basic AC & Refrigeration Recovery. **COST: \$405 (STUDY GUIDE AND EPA EXAM INCLUDED)**

- General Information
- Review of available equipment
- Safety precautions
- Definitions
- Refrigerant pumpdown
- Practice test
- Examination for certification
- Laws and directives
- Recovery & recycle, reclaiming

**This Class Covers Introduction to A2L Flammable Refrigerants**

## ADVANCED HVACR 5 DAY

**DESCRIPTION:** Class is appropriate for those already involved in repair and maintenance of air conditioning and refrigeration equipment. Fifty (50%) percent of this seminar is "hands on" experience in the laboratory.  
**PREREQUISITE:** Basic Air Conditioning & Refrigeration Recovery. **COST: \$2,175**

- Pump-down and repair of system components on low pressure side including refrigerant flow controls Dehydration and evacuation procedures.
- Water-cooled condensers and cooling towers Advanced electrical schematic reading
- Airside problems, psychometrics, capacity calculation
- Troubleshooting the system
- Superheat and subcooling calculation
- Review of refrigeration systems
- Cycle controls - mechanical, electrical and electronic
- Refrigerant oils
- Refrigerant system cycle

## ELECTRICAL 3 DAY

**DESCRIPTION:** Most problems in HVACR systems are electrical. This is a class for those that do not have electrical experience. The three-day class begins with electrical fundamentals and advances to basic electrical troubleshooting techniques. The course will discuss how to diagnose, troubleshoot and repair common components found in HVACR systems. The lab portion of the course includes wiring basic circuits; troubleshooting components and troubleshooting operating systems. The course will show the learner how to use troubleshooting tools such as the voltmeter, ohmmeter and ammeter.  
**COST: \$1,720 (LAB AND MATERIALS INCLUDED)**

- Electrical safety
- Electrical fundamentals
- Use of electrical instruments
- Understanding electrical symbol
- Reading electrical diagrams
- Basic diagnostic, troubleshooting & repair skills
- Using electrical diagrams to troubleshoot
- Planning the troubleshooting process
- Troubleshooting HVACR components such as fuses, transformers, contactors, relays, capacitors, and thermostats
- Troubleshooting fan and pump motors
- Troubleshooting compressor motors
- Troubleshooting HVACR systems
- Learning to apply Ohm's Law
- Wiring basic air conditioning circuits

## TROUBLESHOOTING HVACR & CHILLED WATER SYSTEMS 4 DAY

**DESCRIPTION:** Those attending this seminar should have prior on-the-job experience, as well as some technical training in HVACR. Seventy (70%) percent of this seminar is "hands on" experience in the laboratory. This class will also include the basic knowledge of chilled water systems. **PREREQUISITE:** Basic & Advanced AC and Refrigeration Recovery. **COST: \$2,445 (LAB AND TRAINING MATERIAL INCLUDED)**

- Collecting and analyzing data
- Troubleshooting the entire system electrical and refrigeration
- Cleaning up after a compressor burnout
- Preventing future compressor failures
- Systematic ways of eliminating refrigerant and electrical problems
- Air analysis, problems and measurements
- Capacity calculation
- Detecting and eliminating floodback and slugging problems
- Tuning up your system for maximum efficiency
- Chilled water refrigeration cycle
- Chilled water fluid cycle
- Operation of common refrigeration, fluid and electrical components
- Measuring system cooling capacity
- Measuring system fluid capacity
- Measuring fluid flow
- Electrical sequence of operation
- Refrigerant and oil charging Electrical troubleshooting
- Refrigerant troubleshooting Fluid-side troubleshooting
- Scheduled maintenance

## BONDING & BRAZING LAB 2 DAY

**DESCRIPTION:** This class covers all major types of soldering techniques used commonly in the HVAC industry. Information includes a breakdown of brazing material types and usage, and practical applications. This class is comprised of 75% lab and 25% classroom instruction. Flared fitting preparation and installation is covered as well as push and press lock fittings. Brazing and soldering various metals. We will work with brass, steel, and aluminum. **COST: \$1,200 (LAB AND TRAINING MATERIAL INCLUDED)**

- General facts and safety information
- Brazing copper joints and fittings
- The swedging of copper piping
- Usage of torches, reamers, and cutters
- Usage of flaring tools
- Installing flare fittings on copper
- Copper to aluminum using solder and flux
- Pressure test project up to 200 psi
- Repairing copper tubing using brazing rods
- Repairing aluminum tubing using aluminum fluxed rod