COURSE SYLLABUS

Introduction to HVAC & Safety Fundamentals Course Online (Coming Soon)

Get started in HVAC by learning how heating, ventilation, and air conditioning systems work and which tools technicians rely on. Build the foundational knowledge of safety practices, industry terminology, and career paths needed to launch your trade career.

> Group classes (Live Online) and onsite training are available for this course. For more information, email partnerships@vdci.edu or visit: https://vdci.edu/courses/intro-to-hvac-course-online



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Course Outline

Unit 1: Introduction to the HVAC Industry

- What HVAC stands for
- Purpose of heating, ventilation, and air conditioning
- The role HVAC plays in modern buildings
- Residential, commercial, and industrial HVAC applications
- HVAC industry history and technological evolution
- Overview of HVAC career demand and workforce opportunities
- Learning Activities: Instructor-led discussion, Industry video presentations, HVAC terminology exercises, Classroom discussion on comfort systems

Unit 2: HVAC System Types & Applications

- Split systems
- Package units
- Heat pump systems
- Gas furnace systems
- Air conditioning systems
- Rooftop units
- Mini-split systems
- Ventilation systems
- Basic refrigeration concepts overview
- System Components Overview: Thermostats, Air handlers, Compressors, Condensers, Evaporators, and Duct systems
- Learning Activities: Equipment identification lab, System comparison charts, HVAC component demonstrations

Unit 3: HVAC Career Paths & Professional Development

- Residential installation careers
- Service technician careers
- Commercial HVAC careers
- Refrigeration technician careers
- Building automation and controls
- Energy management careers
- Apprenticeship opportunities
- Certifications and licensing overview
- Employer expectations
- Workplace Skills: Communication skills, Teamwork, Customer service, Time management, Professional appearance, and Work ethics and accountability
- Learning Activities: Career exploration assignment, Resume and professionalism workshop, and Guest speaker or industry interview

Unit 4: HVAC Safety Fundamentals

- Personal Protective Equipment (PPE): Safety glasses, Gloves, Respirators, Steel-toe boots, Hearing protection, and Hard hats
- General Jobsite Safety: Housekeeping practices, Hazard identification, Slips, trips, and falls, Ladder safety, Tool safety, and Material handling
- OSHA Awareness: OSHA overview, Employee rights and responsibilities, Workplace safety standards, and Hazard communication basics
- Fire & Chemical Safety: Fire extinguisher basics, Refrigerant exposure awareness, and Chemical handling precautions
- Lockout/Tagout Awareness: Purpose of lockout/tagout, Electrical hazard prevention, and Basic procedures overview
- Learning Activities: PPE demonstrations, Hazard recognition exercises, Ladder safety demonstrations, Safety scenario discussions, and OSHA safety videos

Unit 5: Electrical Safety Awareness

- Introduction to electricity
- Electrical shock hazards
- Safe use of electrical tools
- Electrical panels awareness
- Circuit breakers and disconnects
- Grounding basics
- Electrical warning labels
- Arc flash awareness
- Safe work distances
- Learning Activities: Electrical hazard identification, Basic meter demonstrations, and Electrical safety simulations

Unit 6: Introduction to HVAC Tools & Equipment

- Hand Tools: Screwdrivers, Nut drivers, Adjustable wrenches, Tubing cutters, and Pliers
- Power Tools: Cordless drills, Saws, and Grinders
- Measuring Instruments: Thermometers, Tape measures, Basic multimeter awareness, and Manifold gauge introduction
- Tool Care & Maintenance: Proper storage, Cleaning procedures, and Inspection practices
- Learning Activities: Tool identification lab, Safe tool handling practice, and Equipment demonstrations

Unit 7: Environmental Awareness & Industry Responsibilities

- Introduction to refrigerants
- Environmental impact of refrigerants

- Energy efficiency concepts
- Sustainability in HVAC
- Indoor air quality overview
- Introduction to EPA regulations
- Learning Activities: Energy efficiency discussion, Indoor air quality demonstrations, and Refrigerant awareness presentation