Day 3 HVAC – Course Curriculum

Program Overview

Program Title

Day 3 HVAC

Program Overview and Length

18 hours of self-paced, on-demand video lessons + topic quizzes + module exams.

For heightened retention of learning, we recommend a 6-week guided schedule ranging from 2.5 to 5 hours per week, depending on topic-driven schedule laid out by Day 3 Academy.

Students are strongly encouraged to attend twice-monthly group office hour calls and to engage with the online learning community.

Delivery Format

- One-year, individual license to Day 3 HVAC program on Day 3 Academy LMS
    - Short, focused video lessons with consistent voice across all material, collected into a single, easy-to-use learning system
    - Topic quizzes (every 10-15 minutes of video, on average)
    - Module exams (every 1-2 hours of video, on average)
- Twice-monthly group office hours through cloud-based video conference
- Peer and mentor interaction through moderated online learning community
- Physical learner package welcomes student with their first psychrometric chart and quick start guides

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Program Purpose

Day 3 HVAC's purpose is stated in our name:

- Day 1: HR Onboarding
- Day 2: HR Onboarding
- Day 3: Technical Onboarding

We deliver immediately impactful learning for the new HVAC professional.

All important aspects of the commercial HVAC industry are covered:

- HVAC Fundamentals
  - Underlying physics and principles, always tied to real-world application
  - Airside systems, components, and equipment
  - Hydronic systems, components, and equipment
- HVAC Industry Fundamentals
  - Pre-construction roles, design process, and reading construction drawings
  - Pre-construction bid workflow connecting design intent to procurement, and managing the bid-to-submittal-to-release process

Learning material is brand neutral, and no college degree is required.

Within 6-weeks, the new professional goes from "brand new" to being able to post their Day 3 HVAC verifiable credential on LinkedIn, sharing an early success with their coworkers and community, and giving an early opportunity for your company to highlight their success publicly.

More importantly, they finish the program with an immediately impactful tool chest ready to be applied to your company's objectives.

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Target Learner & Prerequisites

Intended Audience

This program is designed for early-career professionals and interns in commercial HVAC, including:

- Manufacturer's rep sales and application engineers, parts sales, and project managers
- MEP / AEC consulting firm EITs, designers, and junior engineers
- Mechanical contractor project managers and coordinators
- ESCO / controls project managers and coordinators
- Facilities engineers and project managers

Experience Level

- Career Phase:
  - First week: Most preferred
  - First month: Preferred
  - First year: Strongly Preferred
- Learners are assumed to be reasonably technically capable but are not assumed to have prior exposure to HVAC or the construction process

Prerequisites

- No college degree required
- No prior HVAC coursework required
- Basic comfort with algebra

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Learning Objectives and Outcomes

By the end of Day 3 HVAC's technical onboarding program, learners will be able to:

- Describe key mechanical foundations of HVAC in plain language – basic thermodynamics, fluid mechanics, and heat transfer. These principles will be applicable as tools to be used in work, not as trivia.
- Explain the purpose of each major commercial HVAC subsystem – air distribution, hydronics, refrigeration, and controls – and how they interact to solve building challenges.
- Recognize core HVAC design principles – load calculations, ductwork sizing, psychrometrics, equipment selection – in real-world scenarios.
- Map the new HVAC professional's role in the HVAC project lifecycle and navigate future unknowns by understanding HVAC systems' broader context in the built environment.

Assessment and Completion Criteria

Accountability of learning is provided as follows:

- Topic-level knowledge checks
    - Short quiz question per topic to confirm consistent engagement
- Module exams
    - Extensive module exams (~8-12 questions per hour of video) for concept reinforcement and assessment of student learning

Criteria for Day 3 HVAC completion:

- Completion of 90%+ of video and all topic-level knowledge checks
- Completion of all module exams with grade of 80% or higher

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Detailed Curriculum Outline

- Buildings and HVAC
    - Building Projects: Why?
    - Buildings Have Problems…
    - … HVAC Offers Solutions
    - Diagram of Roles and Understanding Licensure
- Pre-Construction: Design
    - Pre-Design Phase
    - Design Phase: Milestones and Construction Drawings
    - Example: Construction Drawings
- HVAC Principles
    - Introduction to HVAC Principles
    - Units and Unit Systems
    - Thermodynamics
    - Phases of Matter
    - Phase Change
    - Psychrometrics, Pt. 1: Fundamental Properties
    - Example: Psychrometric Fundamental Properties
    - Psychrometrics, Pt. 2: Processes and Mixing
    - Heat Transfer, Pt. 1
    - Heat Transfer, Pt. 2: Modes of Heat Transfer
    - Example: Heat Transfer of Composite Wall
    - Fluid Mechanics, Pt. 1
    - Example: Fluid Mechanics
    - Fluid Mechanics, Pt. 2

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- HVAC Systems
  - Introduction to HVAC Systems and Design
  - Load Calculations
  - Case Study: Load Calculations for a Tech Startup Office
  - HVAC Design as Logistics Strategy
  - Air, Water, Refrigerant
  - Air Distribution Systems
  - Air Distribution Systems: DOAS and Decentralized Air Systems
  - Air Distribution Systems: Room Effect
  - Air Distribution Systems: Duct Design
  - Example: Duct Design for Small Office
  - Hydronic Systems
  - Hydronic Systems: Piping Design
  - Refrigeration Systems for HVAC
  - Building Design and Drawing Technologies
- HVAC System Components
  - Introduction to HVAC System Components
  - Air System Components: Heat Exchangers (Coils, Furnaces)
  - Air System Components: Fans
  - Air System Components: Ductwork and Accessories
  - Air System Components: Air Cleaning
  - Air System Components: Energy Recovery
  - Air System Equipment: Air Handling Units
  - Air System Equipment: Fan-Coils, Blower-Coils, and Terminal Units
  - Air System Equipment: DX, Split Systems
  - Air System Equipment: DX, Packaged Units
  - Air System Equipment: DX, Heat Pumps
  - Air System Equipment: DX, Deep Dive
  - Hydronic System Components: Pipe, Pumps, and Accessories
  - Hydronic System Components: Valves
  - Hydronic System Equipment: Boilers
  - Hydronic System Equipment: Chillers
  - Hydronic System Equipment: Cooling Towers
  - HVAC Control Systems: Purpose, Architecture, and Components
  - HVAC Control Systems: Feedback Control and Techniques

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- Building Systems and Building Codes
  - Buildings are Building Systems
  - Laws, Codes, Standards, Design Guides, and Best Practices
- Pre-Construction: Project Delivery Methods and Contract Types
  - You Are Here: Construction Project Map
  - Project Delivery Methods and Contract Types: Introduction
  - Project Delivery Methods
  - Types of Construction Contracts
- Pre-Construction: Procurement, Solicitation, and Bidding Mechanics
  - Guiding Principles of Construction Procurement
  - Bid Solicitation Types and Documentation
  - Bidding Mechanics: Bidder Logic
  - Bidding Mechanics: Bid Document Conflicts
  - Bidding Mechanics: Official Communication
  - Bidding Mechanics: Cost Estimating and Proposal
  - Case Study: Bidding Mechanics of a Public Library Project
- Pre-Construction: Pre-Mobilization
  - Bid Opening, Project Award, and Buy-Out
  - Procurement Agreements: Subcontracts and POs
  - Value Engineering
  - Pre-Construction Submittals
  - Case Study: Award of a Public Library Project
  - Case Study: Pre-Mobilization of a Public Library Project
- Construction and Post-Construction Phases
  - Mobilization: Construction Begins
  - Mobilization: Material Release Process
  - Project Controls and Administration
  - Construction Execution and Coordination
  - Jobsite Inspections and Testing
  - Post-Construction: Project Closeout and Turnover