

Appendix A

ON THE JOB LEARNING

AND

RELATED INSTRUCTION OUTLINE

DEVELOPED FOR

AUBURN UNIVERSITY FACILITIES MANAGEMENT

2023-AL-117052

Sponsor: Loren Winn

Date: 12/11/2023

Registration Agency: _____

Date: _____

Revised Appendix A, Occupation Registration Date: _____

Appendix A

WORK PROCESS SCHEDULE V.8 HEATING, VENTILATION, AIR CONDITIONING TECHNICIAN

O*NET-SOC CODE: 49-9021.00 RAPIDS CODE: 0637

National Occupation State Occupation

This schedule is attached to and a part of these Standards for the above identified occupation.

1. APPRENTICESHIP APPROACH – 29 CFR § 29.5(b)(2)

Time-based Competency-based Hybrid

2. TERM OF APPRENTICESHIP – 29 CFR § 29.5(b)(2)

The term of the apprenticeship is 8000 hours, supplemented by 710 total hours of related instruction.

3. RATIO OF APPRENTICES TO JOURNEYWORKERS – 29 CFR § 29.5(b)(7)

Every apprenticeship program is required to provide a numeric ratio of apprentices to journeyworkers consistent with proper supervision, training, safety, and continuity of employment.

The apprentice to journeyworker ratio is: 1 apprentice(s) to 1 journeyworker(s).

Total number of journeyworkers employed: 2

4. APPRENTICE WAGE SCHEDULE – 29 CFR § 29.5(b)(5)

Apprentices shall be paid a progressively increasing schedule of wages based on either a percentage or a dollar amount of the journeyworker wage rate. The entry wage must not be less than the minimum wage prescribed by the Fair Labor Standards Act, where applicable, unless a higher wage is required by other applicable Federal law, State law, or respective regulations.

The journeyworker wage for this occupation is \$65,000/year.

| Period | Requirements | Hourly Wage |
|---------------|---|--------------------|
| 1st | Starting wage – complete 2000 hours to move to period 2 wage | \$15.00 |
| 2nd | Complete 4000 total hours to move to period 3 wage | \$16.00 |
| 3rd | Complete 6000 total hours to move to period 4 wage | \$17.00 |
| 4th | Complete all 8000 hours and related instruction to move to end wage | \$18.00 |
| End | Successful completion of all 8000 hours and related instruction | \$22.00 |

5. PROBATIONARY PERIOD – 29 CFR § 29.5(b)(8) and (20)

The probationary period may not exceed 25 percent of the length of the program or 1 year whichever is shorter. Full credit will be given for the probationary period toward the completion of the apprenticeship.

Every applicant selected for apprenticeship will serve a probationary period of 2000 hours.

6. SELECTION PROCEDURES – 29 CFR § 29.5(b)(10), (21) and 29 CFR § 30.10

SECTION I – MINIMUM QUALIFICATIONS

Applicants will meet the following minimum qualifications to be eligible for the pool of applicants:

A. Age

Applicants must not be less than 16 years of age and provide appropriate verification of age respecting Alabama state laws.

B. Education

Applicants must have a high school diploma, General Educational Development (GED) equivalency, or other high school equivalency credential. Applicant must provide an official transcript(s) for high school and any post-high school education.

C. Physical

Applicants will be physically capable of performing the essential functions of the apprenticeship program, with or without a reasonable accommodation, and without posing a direct threat to the health and safety of the individual or others.

SECTION II – SELECTION PROCEDURES

The sponsor has adopted the following selection procedures, consistent with the requirements set forth in 29 CFR § 30.10(b):

- A. Applications will be accepted as specified by the sponsor.
- B. Every applicant will be required to complete an application that will be made available by the sponsor.
- C. Completed applications will be checked for minimum qualifications. Applicants deficient in one or more qualifications or requirements or making false statements on their applications will be disqualified and no further processing of such application will be taken.
- D. Applicants who meet the minimum qualifications will be entered into the pool of eligible applicants.
- E. Applicants will have the opportunity to review the standards, the sponsor's written rules and policies, and the apprenticeship agreement during the application process and prior to joining the program.
- F. Sponsor will conduct interviews and internal human resources procedures prior to an offer of employment.

SECTION III – DIRECT ENTRY

The sponsor who invokes a direct entry provision may do so without regard to the existing selection procedure or minimum qualifications used for entry into the apprenticeship program. Direct entry shall be done without regard to race, color, religion, national origin, sex (including pregnancy and gender identity), sexual orientation, genetic information, or an individual with a disability or a person 40 years old or older. The methods for direct entry are as follows:

- A. A military veteran who has completed military technical training school and/or participated in a registered apprenticeship program or related occupation while in the military in the occupation registered. Applicants must submit a DD-214 to verify military training and/or experience if they are a veteran and wish to receive consideration for such training/experience. The sponsor will evaluate the training received to grant appropriate credit.

- B. An individual who has completed an AOA certified pre-apprenticeship training program and meets the minimum qualifications of the apprenticeship program. may be admitted directly into the program. The applicant shall provide official documentation confirming that they fulfilled the specific requirements of the pre-apprenticeship program, such as skills assessments, completion/graduation certificates, and transcripts. The sponsor will evaluate the pre-apprenticeship training received to grant appropriate credit.
- C. Individual who is a current employee. The sponsor will evaluate the current employee's skills to grant appropriate credit.

ON-THE-JOB LEARNING OUTLINE
HEATING, VENTILATION, AIR CONDITONING TECHNICIAN

O*NET-SOC CODE: 49-9021.00 RAPIDS CODE: 0637

On-the-Job Learning Guidelines:

- During the apprenticeship, the apprentice shall receive work experience and job-related education in all phases of the occupation, including safe work practices, necessary to develop the skill and proficiency of a skilled professional.
- The program sponsor must ensure apprentices are rotated throughout the various job functions to ensure a well-rounded professional upon completion of the apprenticeship and identify what methodology will be used to track progression of experience on-the-job.
- The on-the-job learning outline does not need to be followed in any particular sequence. In all cases, the apprentice is to receive sufficient experience to make them fully competent in all job functions.
- Such on-the-job learning shall be carried on under the direction and guidance of a qualified professional.

| | ON-THE-JOB LEARNING | HOURS |
|-----------|---|--------------|
| 1. | <p>Safety, Customer Relations</p> <ul style="list-style-type: none"> • Safe handling of refrigerants, pressurized gasses, and combustibles • Use of Safety Data Sheet information • Lockout & tag out procedures. • Practice ladder and scaffold safety • Maintain work area properly. • Demonstrate Proper techniques for lifting and carrying. • Properly handle gas cylinders, hoses, and regulators. • Practice Fire safety when operating heating equipment or working with hot materials. • Demonstrate safe use of chemicals. • Identify and report potential safety hazards. • Demonstrate verbal and written communication to clients and on projects. | 400 |

| | | |
|----|---|------|
| 2. | <p>Heating Ventilation and Refrigeration Basics and Orientation</p> <ul style="list-style-type: none"> • Identify common seals, bearings, gaskets and packing materials. • Identify belt drive components and replace, align, and adjust tension of these components. • Demonstrate understanding of the basic refrigeration cycle. • Identify and demonstrate understanding of the operation of common HVACR systems. • Accurately read blueprints and specifications including symbols, schedules, details, and proficiently locate specific information. • Demonstrate understanding of the different refrigerate types and their uses. • Perform general mathematical calculations to calculate heat loads of spaces. | 1200 |
| 3. | <p>Heating Ventilation and Refrigeration Maintenance</p> <ul style="list-style-type: none"> • Inspect and maintain common packaged and split HVACR systems. • Demonstrate understanding of common preventative maintenance programs and processes. • Explain the sequence of operation of common airside accessories- humidifiers, dehumidifiers, electronic air cleaners, economizers, UV lighting systems, and heat recovery systems. • Demonstrate ability to use common troubleshooting tools and equipment. • Diagnose and troubleshoot heat pump system controls, and components • Demonstrate common breakdown repair procedures and methods. | 1400 |
| 4. | <p>Boiler and Chiller Maintenance</p> <ul style="list-style-type: none"> • Demonstrate understanding of gas and electrical boiler operation. • Demonstrate the troubleshooting and repair of gas and electric boilers. • Identify and properly test common boiler safety devices. | 900 |

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|----|---|------|
| | <ul style="list-style-type: none"> • Demonstrate understanding of heat exchanger operation and components. • Demonstrate understanding of basic chiller operation and components. • Demonstrate the troubleshooting and repair of chillers. | |
| 5. | <p>Commercial Air Conditioning and Refrigeration.</p> <ul style="list-style-type: none"> • Describe commercial heating ventilation and refrigeration airside and exhaust systems. • Demonstrate the knowledge of constant volume, variable volume and variable volume/temperature (VVT) systems and their applications. • Troubleshoot and repair various air terminal and air delivery equipment. • Demonstrate the knowledge of heat recovery system types. • Identify the key components, the operation, and common service issues pertaining to packaged and split air handling equipment, economizers, air filtration and other common accessories. • Demonstrate the knowledge of commercial refrigeration system types and repairs. | 1400 |
| 6. | <p>Soldering, Welding, Pipefitting, Tube Bending and Fitting</p> <ul style="list-style-type: none"> • Install and support soldered/brazed joints and mechanical/flared connections of various types of copper pipe/tubing. • Design and install steel piping in residential and commercial applications using fitting geometry including allowances, methods of joining and threading, installation of hangers and other support means. • Install various types of pipe and ductwork insulation materials. • Demonstrate knowledge of basic sheet metal fabrication and installation. | 800 |
| 7. | <p>Electrical and Controls</p> <ul style="list-style-type: none"> • Demonstrate use of wiring diagrams to troubleshoot electrical and control system failures. | 1100 |

| | | |
|----|---|-------------|
| | <ul style="list-style-type: none"> • Demonstrate understanding of single phase and three phase motors. • Diagnose and troubleshoot gas heating system controls, flame and pilot verification systems, and components. • Start and setup variable frequency drives as well as resolve common issues. • Troubleshoot common control circuits and load components. • Operate, install, and troubleshoot temperature controls and various types of thermostats. • Troubleshoot and service electronically commutated motors (ECM) • Inspect cooling system for primary controls, safeties, refrigerant control valves, and regulators. | |
| 8. | <p>Digital Controls</p> <ul style="list-style-type: none"> • Demonstrate basis understanding of direct digital control systems and common components. • Demonstrate the use of computer based direct digital control system for troubleshooting of HVAC systems. | 800 |
| | TOTAL HOURS | 8000 |

RELATED INSTRUCTION OUTLINE
HEATING, VENTILATION, AIR CONIDTIONING TECHNICIAN

O*NET-SOC CODE: 49-9021.00 RAPIDS CODE: 0637

Related Instruction Guidelines:

- The course listings outline the related instruction that supplements the on-the-job learning. It is through the combination of both the on-the-job learning and the related instruction that the apprentice can reach the skilled level of the occupation.
- Each apprentice's attendance and progress in related education must be tracked and appropriate records maintained.
- Time devoted to the job-related education shall not be considered as part of the on-the-job learning.
- Failure on the part of the apprentice to fulfill their obligation as to the related education and/or attendance, or their failure to maintain passing grades therein, shall constitute adequate cause for cancellation of their Apprenticeship Agreement.

Hours Instruction Provided: During Work Hours During Non-Work Hours Both
 Instruction Method: Classroom Correspondence/Shop Web-Based Learning
 Apprentices will be paid for hours spent attending related instruction classes.

RTI Provider Name: Auburn University Facilities Management
 Contact Name: Dan Whatley
 Contact Phone: 334-844-7411
 Contact Email: wdw0013@auburn.edu
 Contact Address: 1161 W Samford Avenue, Auburn, AL 36849

| COURSE | TITLE | SEAT HOURS |
|---|---|-------------------|
| Core: Introduction to Basic Construction | | |
| Module ID 00100 | Build Your Future in Construction | 2.5 |
| Module ID 00101 | Basic Safety (Construction Site Safety Orientation) | 12.5 |
| Module ID 00102 | Introduction to Construction Math | 10 |
| Module ID 00103 | Introduction to Hand Tools | 12.5 |
| Module ID 00104 | Introduction to Power Tools | 10 |
| Module ID 00105 | Introduction to Construction Drawings | 10 |
| Module ID 00106 | Introduction to Basic Rigging | 7.5 |
| Module ID 00107 | Basic Communication Skills | 7.5 |

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|----------------------|--|------|
| Module ID 00108 | Basic Employability Skills | 7.5 |
| Module ID 00109 | Introduction to Materials Handling | 5 |
| HVACR Level 1 | | |
| Module ID 03101 | Introduction to HVACR | 5 |
| Module ID 03102 | Trade Mathematics | 10 |
| Module ID 03106 | Basic Electricity | 15 |
| Module ID 03108 | Introduction to Heating | 15 |
| Module ID 03107 | Introduction to Cooling | 30 |
| Module ID 03109 | Air Distribution Systems | 15 |
| Module ID 03103 | Basic Copper and Plastic Piping | 12.5 |
| Module ID 03104 | Soldering and Brazing | 10 |
| Module ID 03105 | Basic Carbon Steel Piping | 10 |
| HVACR Level 2 | | |
| Module ID 03215 | Basic Maintenance | 20 |
| Module ID 03202 | Chimneys, Vents and Flues | 5 |
| Module ID 03206 | Alternating Current | 10 |
| Module ID 03302 | Compressors | 12.5 |
| Module ID 03301 | Refrigerants and Oils | 15 |
| Module ID 03205 | Leak Detection, Evacuation, Recovery, and Charging | 30 |
| Module ID 03303 | Metering Devices | 12.5 |
| Module ID 03211 | Heat Pumps | 20 |
| Module ID 03213 | Sheet Metal Duct Systems | 10 |
| Module ID 03214 | Fiberglass and Flexible Duct Sys | 7.5 |
| Module ID 03201 | Commercial Airside Systems | 12.5 |
| Module ID 03204 | Air Quality Equipment | 5 |
| Module ID 03203 | Introduction to Hydronic Systems | 15 |

| HVACR Level 3 | | |
|----------------------|---|------------|
| Module ID 03313 | Fasteners, Hardware, and Wiring | 10 |
| Module ID 03314 | Control Circuit and Motor Troubleshooting | 30 |
| Module ID 03210 | Troubleshooting Cooling | 20 |
| Module ID 03311 | Troubleshooting Heat pumps | 12.5 |
| Module ID 03209 | Troubleshooting Gas Heating | 15 |
| Module ID 03310 | Troubleshooting Oil Heating | 15 |
| Module ID 03312 | Troubleshooting Accessories | 7.5 |
| Module ID 03315 | Zoning, Ductless and Variable Refrigerant Flow | 15 |
| Module ID 03305 | Commercial Hydronic Systems | 12.5 |
| Module ID 03306 | Steam Systems | 10 |
| Module ID 03304 | Retail Refrigeration System | 15 |
| Module ID 03316 | Customer Relations | 5 |
| HVACR Level 4 | | |
| Module ID 03308 | Water Treatment | 10 |
| Module ID 03403 | Indoor Air Quality | 12.5 |
| Module ID 03404 | Energy Conservation Equipment | 7.5 |
| Module ID 03405 | Building Management Systems | 12.5 |
| Module ID 03402 | System Air Balancing | 15 |
| Module ID 03406 | System Startup and Shutdown | 15 |
| Module ID 03401 | Construction Drawings and Specs | 12.5 |
| Module ID 03407 | Heating and Cooling System Design | 22.5 |
| Module ID 03408 | Commercial/Industrial Refrigeration Systems | 20 |
| Module ID 03409 | Alternative and Specialized Heating and Cooling Systems | 10 |
| Module ID 46101 | Fundamentals of Crew Leadership | 22.5 |
| | TOTAL | 710 |

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| National Center for Construction Education and Research (NCCER) Credentials |
| NCCER CORE |
| NCCER HVACR LEVEL 1 |
| NCCER HVACR LEVEL 2 |
| NCCER HVACR LEVEL 3 |
| NCCER HVACR LEVEL 4 |