APPRENTICESHIP PROGRAM PURPOSE AND OBJECTIVES

The purpose of the Registered Apprenticeship Program is to be the source of skilled trades employees in various crafts to become future leaders.

Apprenticeship is a system of learning while earning, and "learning by doing." Today, it is utilized chiefly in the skilled crafts. Each program operates under training standards agreed to by management in accordance with State and Federal laws, under which the Apprentice works with a skilled tradesperson, gaining on-the-job skills and "know-how" to in turn become an important part of the occupation and industry.

Registered through the Commonwealth’s Department of Labor and Industry, the Registered Apprenticeship Program at the University of Virginia is designed to establish and maintain high standards of work performance through the development of skilled employees using on-the-job training supplemented by technical and theoretical classroom instruction. This program will provide promotional opportunities for candidates and an avenue for entry into the skilled trades for those who have minimal or no training in the trades’ field.

The standards set forth in this program are designed to guide the employee and the University through the Registered Apprenticeship process and to explain the operation of our comprehensive Registered Apprenticeship Program.

Equal Opportunity/Affirmative Action: Consistent with Federal and State law, the University does not discriminate in any of its programs, procedures or practices on the basis of age, color, disability, national or ethnic origin, political affiliation, race, religion, sex (including pregnancy), sexual orientation, or veteran status. The University operates both affirmative action and equal opportunity programs for faculty, staff, and students consistent with resolutions of the Board of Visitors and with federal and state requirements.
APPRENTICESHIP RECRUITMENT

The Apprenticeship Program Manager is responsible for working with FM management in determining when recruitment of Apprentices is necessary. If positions are available, Occupational Training will conduct necessary recruitment efforts by working with the University Academic Recruitment Team in posting vacant positions, advertising openings, and accepting applications in accordance with University of Virginia staffing policies.

The Apprenticeship Program Manager will convene a Search Committee and Stakeholder Committees to review the top applicants in each trade being recruited once the University Academic Recruitment Team has vetted all applications.

The search committee should include:

1. A representative from Occupational Training to serve as the Hiring Official and Search Committee Chair
2. A representative from each trade being recruited including a representative from each related working group across FM
3. A representative from FM’s apprentice graduate alumni

The stakeholder committees should include:

1. One member of management to serve on each stakeholder committee
2. One representative from each related working group across FM to serve on each stakeholder committee
3. One current apprentice to serve on each stakeholder committee

Each apprentice must meet the following requirements:

1. Be at least 18 years of age prior to the projected date of hire
2. Able to meet physical requirements for their prospective trade
3. Have a high school diploma or equivalent prior to the projected date of hire
4. Personal interview with Search Committee and Stakeholder Committee that assesses competencies including initiative, problem-solving skills, teamwork, and leadership presence
5. Comprehensive reference and background checks
RESPONSIBILITIES

In collaboration with the Department of Labor and Industry, Facilities Management is responsible for the effective administration of the Registered Apprenticeship Program. These administration efforts are led by Occupational Training and entail items including, but not limited to, recruitment, training oversight, program enhancements, and records management.

Directors, managers and supervisors are responsible for implementation and administration of the procedures and guidelines contained in this program guide.

These standards may be modified at any time with the approval of Facilities Management leadership.
OPERATION AND ADMINISTRATION

Registered Apprenticeship Program Agreements

Upon acceptance into the Registered Apprenticeship Program, each Apprentice shall sign two written documents:

1. The University of Virginia Apprenticeship Code of Conduct describes policies pertinent to employment at the University of Virginia. See attachment A, University of Virginia Apprenticeship Code of Conduct.

2. The Commonwealth of Virginia Apprentice Agreement Form registers the Apprentice as a participant in a state recognized Apprenticeship Program. See attachment B, Commonwealth of Virginia Apprentice Agreement Form.

Term of a Registered Apprenticeship

The term of Apprenticeship is the period of time required to complete the number of hours of on-the-job training and classroom instruction as determined by the Department of Labor and Industry and Facilities Management. The term will be four years or until program requirements are met.

Cancellation of Agreement

Cancellation of the Apprenticeship Program Agreement will normally be made by Facilities Management only if the Apprentice is not fulfilling their obligations as outlined in the Apprenticeship Code of Conduct.

The Apprentice may voluntarily terminate the agreement through written notification, which may result in separation from the University. An Apprentice may voluntarily leave the program and retain employment if s/he successfully completes and accepts an offer for a vacant University position.

Probationary Period

Apprentices who are new University employees will be subject to a probationary period of at least one-year as outlined by University Staff policies.

Credit for Previous Training and Work Experience in the Trade

An employee may request that Occupational Training evaluate prior experience and training for credit towards the program requirements. Such experience must be documented by a journey-level tradesperson and will be measured against the work process training requirements for that trade. Decisions regarding advancement will be made in conjunction with recommendations from management and the Department of Labor and Industry. Any credit that is awarded for prior experience will be formally documented to the Apprentice and management.
Apprentice Duties

**Apprenticeship Roundtables**
All apprentices are required to attend Apprenticeship Roundtables. Roundtables will focus on trade specific educational topics as well as program updates.

**Monthly Assessments**
All apprentices are required to have submitted their portion of the Monthly Assessment within the first business week of each calendar month.

**Timekeeping**
All apprentices are required to enter their working hours into AiM as instructed – which includes the selection of the corresponding category related to the work process (see attachment C)

Supervision of Apprentices

In order to meet specific training needs outlined on the Apprenticeship Work Process, Occupational Training and departmental management will coordinate rotations of each Apprentice through various departments related to their trade throughout the Apprenticeship. The Apprentice’s current supervisor will complete a monthly assessment and provide feedback regarding the apprentice’s on-the-job hours to assist in monitoring training progress.

Certification

Those Apprentices who complete their academic work and job-related training will be awarded Apprenticeship diplomas by the Commonwealth of Virginia from Facilities Management and will be promoted to the journey level. When applicable, apprentice graduates are required to pass the state licensure certification exam after graduation. If they have not met these criteria within six months of completing the academic classes and job-related training, they will be subject to appropriate actions as determined by departmental management. Other actions, which may occur, will be in accordance with the Standards of Conduct.
APPRENTICESHIP INSTRUCTION

Each Apprentice will receive a combination of 8,000 hours of on-the-job training instruction and formal classroom instruction. A Work Process is available for each trade to guide on-the-job training during the program. All Work Processes are available in Attachment C, Apprenticeship Work Processes. The academic institutions and their instructors provide classroom curriculums and technical trades training that fulfill the program’s requirement of 576 hours of coursework.

On-the-Job Evaluation & Assessment

Several methods are used to monitor the progress of Apprentices in the program. The tools utilized below are in addition to performance evaluation methods utilized by the University for all employees.

Monthly Assessment

In addition to on-going informal discussions and feedback, apprentices and supervisors will complete a monthly assessment that provides management with detailed information regarding the apprentice’s on-the-job performance, overall progress, areas needing improvement, etc. Management comments may also be noted each month on the Apprentice Monthly Assessment.

Annual Hands-on Evaluation

Apprentices will be evaluated annually through a Hands-on Evaluation. The evaluation measures performance by taking the individual skills for each trade from the Work Process (see Attachment C). This evaluation will occur at the conclusion of the spring semester each year and be administrated by a third party. Results from the evaluation will be reviewed by Occupational Training and members of FM management to determine an apprentice’s progression in the program. This information will also serve as a tool to determine the most beneficial placement as the Apprentice rotates through the program as well as to assess on-the-job training completion.

Academic Evaluation & Assessment

As students, Apprentices are subject to the rules and policies of the institution offering the classroom instruction. Apprentices are required to attend classes regularly (zero class absences), satisfactorily complete assignments and achieve grades of “B” or higher for all related instruction classes. Expenses associated with academic instruction, such as course fees and books, are paid for by the program. The Apprentice shall not receive any compensation for time spent in attending, or in studying and preparing for, related classroom instruction. Tutoring may be provided as appropriate to aid in the Apprentice’s success.
The institution offering academic training will submit reports indicating attendance and academic progress for each Apprentice. These reports will be submitted to and reviewed by Occupational Training and matters of concern, such as absences and/or unsatisfactory interim grades, will be forwarded to management so that assistance/counsel may be promptly provided to the Apprentice.

At the end of each academic term, a summary will be provided to the Apprentice, Occupational Training, the current supervisor and manager, and appropriate senior management.

Matters of Persistent Instructional Concernhip

If continuous on-the-job and/or academic deficiencies are present despite informal counseling, management will coordinate with Occupational Training and Human Resources Business Partners to develop a plan of corrective action. Such action will be taken in accordance with State and University policies including, but not limited to, the Standards of Conduct.

Advancement

Based on his or her academic and on-the-job performance, Occupational Training and management may formally recommend that the Apprentice continue to advance through the program. If Occupational Training and management does not recommend the Apprentice for progression, Occupational Training and management will design a differentiated progression plan.
APPRENTICESHIP CODE OF CONDUCT

This Agreement, entered into this ____ day of ____ , 2018, between Facilities Management on behalf of the University of Virginia (the "University"), and _____________ (the "Apprentice") witnesses that:

1. The Apprentice has applied for employment with the University of Virginia in connection with Facilities Management’s Apprenticeship Program in the trade of ________________, and has been accepted for such employment. During the term of such employment, Facilities Management will provide on-the-job work and training and will also provide for the Apprentice's enrollment and participation in academic courses required in connection with said program (but not as part of the Apprentice’s paid employment).

2. The Apprentice agrees to diligently and faithfully abide by the principles outlined in the Apprenticeship Program Standards. These standards as amended from time to time, shall apply to and govern all matters related to the Apprenticeship Program and the Apprentice’s participation therein. A copy of the Apprenticeship Program Standards currently in effect is attached hereto as a part of this agreement. Any subsequent amendments thereto shall automatically become part of this agreement.

3. The Apprentice will be an employee of the University of Virginia only in connection with his/her work within Facilities Management and will be paid for such work at the hourly rates set forth in the University's salary structure, as amended from time to time. Other terms and conditions of such employment shall be the same as those applicable to other University Staff employees of the University of Virginia. The employee shall not receive any compensation for time spent in attending, or in studying and preparing for, related classroom instruction.

4. The Apprentice's continued eligibility for the Apprenticeship Program shall be subject to his/her achieving satisfactory progress both in his/her work within Facilities Management, and in the related classroom instruction.

5. The normal term of a particular craft apprenticeship is four years, during which the Apprentice is required to complete 8,000 on-the-job working hours as well as the academic requirements specified in the Apprenticeship Standards. In addition, the Apprentice must pass the Commonwealth of Virginia's journeyman exam as required. Please note that credit against the required number of on-the-job working hours may be granted under the program for previous craft experience, if any.

The Apprentice acknowledges receipt of a copy of this Agreement, including the Apprenticeship Program Standards above referred to, and states that he/she has read, understands, and accepts all terms and conditions thereof.

______________________________________________________________
Apprentice Name

______________________________________________________________
Apprenticeship Program Manager Name

Apprenticeship Code of Conduct
Last Revised July 2018
APPRENTICE AGREEMENT FORM

The program sponsor and apprentice agree to the terms of the Apprenticeship Standards incorporated as part of this Agreement. The sponsor will not discriminate in the selection and training of the apprentice in accordance with the Equal Opportunity Standards in Title 29 CFR Part 39.3 and Executive Order 11246. This agreement may be terminated by either of the parties, citing cause(s), with notification to the registration agency, in compliance with Title 29, CFR, Part 29.6.

Apprentice Name: (Type or print name as it should appear on completion certificate)

<table>
<thead>
<tr>
<th>First Name</th>
<th>Middle Initial</th>
<th>Last Name</th>
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<tbody>
<tr>
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</tbody>
</table>

Address: City: VA Zip Code: Phone:  
App (For office use only): Sex: Occupation: 

Date of Birth: Veteran: DOT/O*NET Code: 
Race: Length of Program: 8000 Hours - Probation: 2000 Hours 
Education Level: Starting Date: Estimated Completion Date: 

Prior on-the-job training credit hours: 

Name of company/sponsor: 

Related Instruction Provider: ARL Size: 

Related Instruction (Number Hours Per Year): 
Apprentice Wages For Related Instruction Attendance: ☑ Will Be Paid ☒ Will Not Be Paid (Check one) 

Signature of Apprentice: Date: 
Signature of Parent/Guardian (If minor): Date: 

Sponsor: UVA Facilities Management 
Name of Sponsor Representative: 

Address: P.O. Box 400 00726 
City/County: Charlottesville 
State: VA 
Zip Code: 22904 
Phone: (434) 982-5308 
Fax: Email: 

PLEASE CHECK IF THIS IS A: ☑ REGISTRATION ☒ SUPERSEEDING AGREEMENT ☒ REINSTATEMENT ☒ COMMUNITY COLLEGE CODE 
Journeyworker's Hourly Wage: Apprentice's Entry Hourly Wage: 

WAGES 

Term (Mo): 1 2 3 4 5 6 7 8 9 10 
Wage Rate: \$ \% \% 

Signature of Sponsor's Representative: Date Signed: Name and Address of Sponsor Designee to Receive Complaints (If applicable): 

Registered with the Virginia Department of Labor and Industry: Commissioner: Date: 

CANCELLATION: EFFECTIVE DATE: Reason: 

Signature of Sponsor's Representative: Date: 

COMPLETION: Additional Credit Hours at time of completion: (2,000 hours or more is required) 

Signature of Sponsor's Representative: Title: Date: 

Transcript Attached: Yes ☐ No ☐ 

Revised: July 12, 2017

Apprenticeship Program Standards

Last Revised July 2018
CARPENTRY – WORK PROCESS

TRAINING AREAS

<table>
<thead>
<tr>
<th>TRAINING AREAS</th>
<th>APPROXIMATE CUMULATIVE HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. SAFETY PROCEDURES, TOOLS, MATERIALS, COMMUNICATION AND RECORDS:</td>
<td>1000</td>
</tr>
<tr>
<td>1. Formal training in safety procedures in accordance with OSHA regulations, including hazardous materials and work environment.</td>
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<td>2. Identification and proper use of safety equipment including Personal Protective Equipment (PPE)</td>
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<td>3. Working in a safe manner with other trades and building occupants.</td>
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<td>4. Jobsite and workplace organization and cleanliness</td>
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<td>5. Identification, use, care, and repair of tools and specialized equipment.</td>
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<td>6. Use of good communication skills and terminology so as to be able to convey messages to fellow tradespersons, customers and industry representatives.</td>
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</tr>
<tr>
<td>7. Importance and technique of precise record keeping in assessing work, ordering materials, managing timelines, as well as determining equipment wear and potential problems necessary for preventive maintenance.</td>
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</tr>
<tr>
<td>8. Reading and understanding blueprints as they pertain to building layout and all affected trades.</td>
<td></td>
</tr>
<tr>
<td>B. FRAMING:</td>
<td>2000</td>
</tr>
<tr>
<td>1. Reading of drawings to determine location, dimension of interior walls.</td>
<td></td>
</tr>
<tr>
<td>2. Determining use of tools, materials, and equipment.</td>
<td></td>
</tr>
<tr>
<td>3. Laying out of walls, floor joist, other framing members.</td>
<td></td>
</tr>
<tr>
<td>4. Erecting walls, floor joist, other framing members.</td>
<td></td>
</tr>
<tr>
<td>C. EXTERIOR MILLWORK:</td>
<td>800</td>
</tr>
<tr>
<td>1. Repairs and installation of exterior railings, columns, blinds or other architectural woodwork.</td>
<td></td>
</tr>
</tbody>
</table>
CARPENTRY – WORK PROCESS

D. INTERIOR MILLWORK: 1,100
1. Installing baseboards, crown molding or other interior architectural woodwork.
2. Setting doors and jambs.
3. Fitting doors and door hardware.
4. 3rd & 4th Year Apprentices only- Cabinet Shop
   - Installing casework & countertops.
   - Using power tools to produce moldings, baseboards, etc.
   - Matching existing trim, including historical details.

E. INTERIOR WALL COVERINGS: 500
1. Installing sheetrock, fiber board or composition board.
2. Installation of drop ceilings.

F. FLOORS AND STAIRS: 500
1. Laying sub-floors.
2. Laying hardwood flooring.
3. Figuring layout of interior or exterior stairways.
4. Fabrication of stairway stringers, treads, railings.

G. GENERAL AND PREVENTIVE MAINTENANCE: 950
1. Repair of locks, door hardware, soap and towel dispensers, sash cords and other building fixtures.
2. Performance of preventive maintenance checks.

H. DEMOLITION: 1,150
1. Determining areas to be removed by reading drawings.
2. Demolition of interior and exterior walls, floors or other structural members.

TOTAL HOURS 8,000
## ELECTRICAL – WORK PROCESS

### TRAINING AREAS

<table>
<thead>
<tr>
<th>Training Area</th>
<th>Approximate Cumulative Hours</th>
</tr>
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<tbody>
<tr>
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<td>1. Formal training in safety procedures in accordance with OSHA regulations,</td>
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<tr>
<td>3. Jobsite and workplace organization and cleanliness</td>
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<tr>
<td>4. Identification, use &amp; care of tools.</td>
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<tr>
<td>5. Use of good communication skills and terminology so as to be able to</td>
<td></td>
</tr>
<tr>
<td>convey messages to fellow tradespersons, customers and industry representatives.</td>
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<tr>
<td>6. Importance and technique of precise record keeping in assessing work,</td>
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<tr>
<td>ordering materials, managing timelines.</td>
<td></td>
</tr>
<tr>
<td><strong>B. INSTALLATION OF WIRING METHODS:</strong></td>
<td>5000</td>
</tr>
<tr>
<td>1. Installing rigid, EMT and PVC conduit, or other wire raceways.</td>
<td></td>
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<tr>
<td>2. Installing conduits exposed, concealed or underground utilizing</td>
<td></td>
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<tr>
<td>appropriate fittings.</td>
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<tr>
<td>3. Pulling wires through raceways manually and with cable pulling machines.</td>
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<tr>
<td>4. Wiring for small and large motors - single phase and three phase.</td>
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<tr>
<td>5. Sizing overload protection for all types of motor driven equipment.</td>
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<tr>
<td>6. Splicing cables utilizing all types of connectors and compressions</td>
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<tr>
<td>fittings.</td>
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<tr>
<td>7. Splicing different sizes of cables for indoor and direct buried</td>
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<tr>
<td>underground installations.</td>
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<tr>
<td>8. Installing bus duct and bus duct switches.</td>
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<tr>
<td>9. Installing indoor and outdoor lighting fixtures.</td>
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<tr>
<td>10. Installing electrical switchgear and related equipment.</td>
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</tr>
<tr>
<td><strong>C. PREVENTIVE MAINTENANCE &amp; TROUBLESHOOTING:</strong></td>
<td>850</td>
</tr>
<tr>
<td>1. Relamping light fixtures and changing ballasts in all types of fixtures.</td>
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</tr>
<tr>
<td>2. Locating hot spots in motor control units, panel boards, step-down</td>
<td></td>
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<tr>
<td>transformers with use of thermal imaging tools.</td>
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</tbody>
</table>

Revised July 2018
ELECTRICAL – WORK PROCESS

3. Cleaning and torquing electrical switchboards to manufacturers specifications.
4. Preventive maintenance on all types of equipment utilizing PM sheets.
5. Troubleshooting and minor repairs.
6. Core drilling floors.
8. Boring wood and metal joists for conduits and cables.
9. Reading and understanding blueprints as they pertain to building layout and all affected trades.

D. EMERGENCY ELECTRICAL STAND-BY SYSTEMS: 400
   1. Troubleshooting and maintenance of motor generator sets and automatic transfer switches.
   2. Monitoring and appropriate testing for UPS systems, (battery).

E. UNDERGROUND ELECTRICAL CONSTRUCTION: 750
   1. Laying out underground installations for routes and depths.
   2. Designing templates for bolt patterns.

TOTAL HOURS 8,000
### HVAC – WORK PROCESS

#### TRAINING AREAS

**A. SAFETY PROCEDURES, TOOLS, MATERIALS, COMMUNICATION AND RECORDS:**

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<thead>
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</table>

**B. REFRIGERANTS AND REFRIGERATION OILS, LUBRICATION, TOOLS, ELECTRICAL MEASURING DEVICES:**

<table>
<thead>
<tr>
<th>Training Area</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2. Use of refrigeration oils, dryers and filters.</td>
<td></td>
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<tr>
<td>3. Use of bearing lubricants and lubricant characteristics.</td>
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<tr>
<td>4. Operations, use, care and maintenance of hand tools as well as portable power tools used in the HVAC trades, including the use of hoisting equipment.</td>
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<tr>
<td>5. Use of electrical measuring devices including voltmeters, amp meters, ohmmeters and recorders. Safety factors involved when making electrical measurements.</td>
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<tr>
<td>6. Theory of refrigeration and the use of the psychometric chart.</td>
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<tr>
<td>7. Complete explanation of the basic refrigeration cycle.</td>
<td></td>
</tr>
<tr>
<td>8. Air conditioning and refrigeration compressors. (Reciprocating, centrifugal and rotary.)</td>
<td></td>
</tr>
<tr>
<td>9. Air conditioning and refrigeration evaporators including capacity, metering devices, defrosting and maintenance.</td>
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<tr>
<td>10. Air conditioning and refrigeration condensers and cooling towers, including air and water-cooled condensers, evaporative condensers and water treatment.</td>
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<tr>
<td>11. Air conditioning and refrigeration piping including hot gas bypass, piping sizes, piping materials and fittings.</td>
<td></td>
</tr>
<tr>
<td>12. Trouble shooting refrigeration systems as it pertains to their mechanical components.</td>
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</tr>
<tr>
<td>13. Thorough understanding of how to upgrade, retrofit, and replace existing control systems, including sensors, low voltage wiring, controllers, and safety circuits.</td>
<td></td>
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</tbody>
</table>
HVAC – WORK PROCESS

C. AIR HANDLING AND HYDRONIC SYSTEMS; MAINTENANCE, INSTALLATION, AND TROUBLESHOOTING: 1900
1. Performance of air balancing and water balancing tests.
3. Types of fans in air handling equipment.
4. Use of drive components including couplings, v-belts and gears.
5. Study of static pressure and formulas associated with air and water movement.
6. Selection, maintenance and application of water pumps.
7. Maintaining and repairing piping systems.
8. Maintenance and installation of bearings.

D. ELECTRICITY AS IT PERTAINS TO AIR CONDITIONING AND REFRIGERATION: 1500
1. Importance of electrical protection devices including fuses, circuit breakers, overload relays and grounding.
2. Operating principle, starting and maintenance of single-phase motors.
3. Operating principle, starting and maintenance of three phase motors.
4. Operation and maintenance of air conditioning control equipment including motor starters, timers, relays and motor control centers.
5. Drawing wiring diagrams for single phase and three phase circuits.
   Understanding diagrams and the symbols used.
6. Understanding transformer connections and their applications.
7. Understanding basic electronics as it applies to control circuits.
8. Trouble shooting electrical control circuits.
9. Testing and calibrating electric controls including flow switches, thermostats and pressure switches.
10. Fabrication of duct work.
11. Insulating and installing duct work.
12. Demo systems.
13. General understanding of how to perform controls point-to-point checks from sensors to controllers

E. AIR CONDITIONING AND REFRIGERATION CONTROL SYSTEMS: 1600
1. Thorough understanding of building automation systems.
2. General understanding of pneumatic control systems including valves, actuators, thermostats, transmitters and air compressors.
3. Determining the most economical control sequence for air conditioning and refrigeration equipment.
4. Thorough understanding of how electronic control systems are used to control HVAC equipment.
5. Thorough understanding of how to read control system shop drawings.
6. General understanding of the software required to configure building automation system controllers.
7. General understanding of how to download new control programs to controllers.

TOTAL HOURS 8,000

Revised July 2018
PLUMBING – WORK PROCESS

TRAINING AREAS

A. SAFETY PROCEDURES, TOOLS, MATERIALS, COMMUNICATION AND RECORDS:

1. Formal training in safety procedures in accordance with OSHA regulations, including hazardous materials and work environment.
2. Identification and proper use of safety equipment including Personal Protective Equipment (PPE)
3. Working in a safe manner with other trades and building occupants.
4. Jobsite and workplace organization and cleanliness
5. Identification, use, care, and repair of tools and specialized equipment.
6. Use of good communication skills and terminology so as to be able to convey messages to fellow tradespersons, customers and industry representatives.
7. Importance and technique of precise record keeping in assessing work, ordering materials, managing timelines, as well as determining equipment wear and potential problems necessary for preventive maintenance.
8. Reading and understanding blueprints as they pertain to building layout and all affected trades.

B. WASTE, VENT & STORM SEWER PIPING SYSTEMS; MAINTENANCE, INSTALLATION AND TROUBLESHOOTING:

1. Understanding of materials including why they are necessary for the specific task.
2. Proper grading.
3. Layout of system.
4. Sizing of the drain piping.
5. Rough-in measurements.
6. IPC installation required.
7. Different types of venting systems.
8. Sizing of vent piping.
9. Materials
10. Proper grading
11. Pipe sizing
12. Different types of storm sewers
   a. Area drains
   b. Sheet run-off
   c. Roof drains
   d. Roof leaders
   e. Mains, etc.
13. IPC installation requirements

APPROXIMATE CUMULATIVE HOURS

A. 1000
B. 2000
PLUMBING – WORK PROCESS

C. HOT AND COLD DOMESTIC WATER SYSTEMS; MAINTENANCE, INSTALLATION, AND TROUBLESHOOTING:

1. Domestic or potable.
2. Individual water supply.
3. Deionized and reverse osmosis water systems
5. Sizing of water pipe.
6. IPC installation requirements.
7. Fixtures and devices.
8. Different ways to obtain hot water.

D. MECHANICAL PIPING SYSTEMS; MAINTENANCE, INSTALLATION, AND TROUBLESHOOTING:

1. Identification of various pipes and fittings.
2. Instruction of different pipe joints such as:
   a. screw type
   b. soldered
   c. braised
   d. glue
   e. no hub
   f. mechanical
   g. welded
3. Gas piping.
4. Air lines.
5. Vacuum.
6. Chilled water piping.
7. Steam pipe:
   a. Different pressures
   b. Reducing stations
   c. Traps
   d. Condensation and pumps
   e. Expansion joints and tanks
   f. How to work around steam pipes in a safe manner
8. Heating systems.
9. Sprinkler systems.
10. Refrigeration Piping
11. Lead pipe joints
12. Understanding of basic interface between trades
PLUMBING – WORK PROCESS

E. HOSPITAL AND LAB PIPING EQUIPMENT; MAINTENANCE, INSTALLATION, AND TROUBLESHOOTING:

1. Medical gas systems:
   a. Nitrous Oxide
   b. Nitrogen
   c. CO2
   d. Oxygen
   e. Medical Air
   f. Medical Vacuum
   g. Compressed Air
2. Fixtures.
3. Code applications:
   a. Plumbing
   b. Mechanical
   c. Facility guidelines
4. Vacuum.

F. PREVENTIVE MAINTENANCE:

1. Pumps
2. Traps
3. Manifolds
4. Air systems
5. Backflow devices

TOTAL HOURS 8,000
# MASONRY – WORK PROCESS

## TRAINING AREAS

<table>
<thead>
<tr>
<th>A. SAFETY PROCEDURES, TOOLS, MATERIALS, COMMUNICATION AND RECORDS:</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Formal training in safety procedures in accordance with OSHA regulations, including hazardous materials and work environment.</td>
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<tr>
<td>2. Identification and proper use of safety equipment including Personal Protective Equipment (PPE)</td>
<td></td>
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<tr>
<td>3. Working in a safe manner with other trades and building occupants.</td>
<td></td>
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<tr>
<td>4. Jobsite and workplace organization and cleanliness</td>
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<tr>
<td>5. Identification, use, care, and repair of tools and specialized equipment.</td>
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<tr>
<td>6. Use of good communication skills and terminology so as to be able to convey messages to fellow tradespersons, customers and industry representatives.</td>
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</tr>
<tr>
<td>7. Importance and technique of precise record keeping in assessing work, ordering materials, managing timelines, as well as determining equipment wear and potential problems necessary for preventive maintenance.</td>
<td></td>
</tr>
<tr>
<td>8. 3rd &amp; 4th Year Apprentices only: Reading and understanding blueprints as they pertain to building layout and all affected trades.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. CONCRETE MASONRY UNIT CONSTRUCTION:</th>
<th>2250</th>
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</thead>
<tbody>
<tr>
<td>1. Use of tools.</td>
<td></td>
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<tr>
<td>2. Layout and bonding.</td>
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<tr>
<td>3. Mortar mixes.</td>
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<tr>
<td>4. Scaffolding</td>
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<tr>
<td>5. Installation of CMU walls.</td>
<td></td>
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<tr>
<td>6. Wall openings:</td>
<td></td>
</tr>
<tr>
<td>a. doors, windows, wall penetrations</td>
<td></td>
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<tr>
<td>b. lintels</td>
<td></td>
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<tr>
<td>7. Proper joint and surface finishing.</td>
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</tbody>
</table>
C. BRICKLAYING:  2400
1. Use of tools.
2. Layout, bonding and patterns.
3. Mortar mixes.
4. Scaffolding.
5. Installation of brick walls.
6. Installation of brick pavers.
7. Wall openings.
8. Proper joint and surface finishing:
   a. methods of cleaning brickwork

D. MASONRY RESTORATION/PRESERVATION:  2350
1. Use of tools.
2. Layout, bonding and patterns.
3. Mortar mixes.
4. Reinforcing.
5. Installation of brick walls.
6. Wall openings.
7. Proper joint and surface finishing:
   a. methods of cleaning brickwork

TOTAL HOURS  8,000
PLASTERING/DRYWALL – WORK PROCESS

Plastering/DRYWALL apprentices will need to be rotated through their shop with different OJT, as there is no other shop to rotate them to.

<table>
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<tr>
<th>TRAINING AREAS</th>
<th>APPROXIMATE CUMULATIVE HOURS</th>
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<tr>
<td>B. PLASTERING:</td>
<td>2350</td>
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<td>1. Use of tools.</td>
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<tr>
<td>2. Lath, Board Installation</td>
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<tr>
<td>4. Leveling Coat</td>
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<tr>
<td>5. Finish coats.</td>
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<tr>
<td>6. Veneer Plaster</td>
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<tr>
<td>7. Ornamental plastering:</td>
<td></td>
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<tr>
<td>a. molds and templates</td>
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<tr>
<td>b. cornice and mitering</td>
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<tr>
<td>c. arches, columns, etc.</td>
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</tbody>
</table>
C. DRY WALL:

1. Use of tools.
2. Dry wall installation.
4. Taping dry wall joints.
5. Block Coat
7. Finish coats and sanding.

D. PLASTER RESTORATION/ PRESERVATION:

1. Use of tools.
2. Layout.
4. Base Coat
5. Leveling Coat

TOTAL HOURS 8,000