

HVAC EXCELLENCE

ACCREDITATION MANUAL

Building Automation Systems

Green Mechanical Systems

HVACR Technologies





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Programmatic Accreditation

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Overview and Benefits of Programmatic Accreditation

HVAC Excellence, founded in 1994, enhances technical competencies through validated education. By continually setting and verifying program standards, we help ensure that our future and incumbent workforce is well-prepared to meet ever-changing industry challenges.

Programmatic Accreditation

Programmatic accreditation is an independent, non-governmental, third-party review of educational program(s). The process of programmatic accreditation aims to validate that established standards of excellence for an educational program are met. These standards are designed to ensure that the future workforce receives the quality training required to acquire the skills and knowledge necessary for success in the industry.

It is important to note that programmatic accreditation is not the same as institutional accreditation. While institutional accreditation evaluates the educational institution, considering aspects such as governance, administration, finances, and the institution's educational mission, programmatic accreditation specifically focuses on the quality and standards of individual programs within the institution.

Accreditation standards encompass various aspects of the program, including the program's mission, administrative responsibilities, finances and funds, student services, instructional design, program elements, physical facilities, equipment and tools, cooperative training opportunities, and instructor qualifications. These standards are carefully examined to assess the program's compliance with the established criteria for quality and effectiveness.

Types of Programmatic Accreditation

HVAC Excellence provides third-party accreditation for educational programs in various disciplines, including:

- **Building Automation Systems (BAS)**
- **Green Mechanical Systems (GMS)**
- **Heating, Ventilation, Air Conditioning and Refrigeration Technologies (HVACR)**

Educational institutions can apply for programmatic accreditation in any of these three disciplines or a combination of them. The accreditation process ensures that these programs meet established standards of excellence and provide students with high-quality training in their respective fields.

Benefits of Programmatic Accreditation

Accreditation offers numerous benefits, including:

- Assurance that the program meets industry standards.
- A powerful recruitment tool to boost program enrollment.
- Ensures course and program validity, easing the transfer of credits.
- Provides a goal-setting path for self-improvement and program growth.
- Assists in establishing articulation agreements with educational and industry partners.
- The Mechanical Service Contractors of America "MSCA" has named HVAC Excellence as its partner for technician recruitment.
- Through an articulation agreement with the United Association of Journeymen and Apprentices, Graduates may be eligible for advanced placement opportunities into their apprenticeship program.
- Accredited programs are listed in a public directory.



Teresa Pezzi
Executive Director, MSCA
tpezzi@mcaa.org

The contractor members of the Mechanical Service Contractors of America (MSCA) are constantly looking for new technicians to fill job vacancies nationwide.

Who is the MSCA? We are the leading national trade association for heating, air conditioning, refrigeration, plumbing and facility operations contractors representing companies such as Johnson Controls, Carrier Commercial, EMCOR, McKinstry, and over 1,200 other prominent members. We are a subsidiary of the Mechanical Contractors Association of America, an organization that represents over 2,600 mechanical contractors and top employers in North America.

We understand that you may have more job postings than students to fill. However, not all jobs are created equal! Our member companies offer career opportunities with:

- The potential to EARN up to six figure income per year
- Numerous BENEFITS including: Health Insurance, Pension Plans, Laptop Computers, Service Vehicles, Uniforms and more.
- Lifelong education with college credits, certification and degree programs
- A career with unlimited opportunity for GROWTH and ADVANCEMENT!

We recognize the importance of a good education for tomorrow's HVAC service technician. If your program has been accredited by HVAC Excellence and your students have passed their HVAC Excellence Employment Ready Certifications, our 1,200 member contractors can fast track your students to a higher entry level as a result of these credentials. It is the job of every school to get their students the best jobs possible. MSCA members offer career placement opportunities that are hard to match.

Sincerely,

A handwritten signature in black ink that reads "Teresa Pezzi". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Teresa Pezzi
Executive Director, MSCA





Articulation Agreement

**Between HVAC Excellence and the United Association
for Advanced Placement in an HVACR Apprenticeship Program**



Agreement

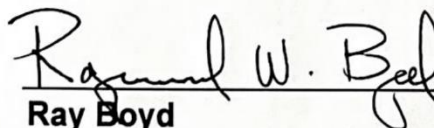
This agreement is between the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada (UA), and HVAC Excellence. The agreement is effective from August 15, 2023, and shall continue in force until either party notifies the other in writing or cancels the agreement.

This agreement establishes an advanced placement opportunity in a local union's HVACR apprenticeship program for applicants who meet the following requirements:

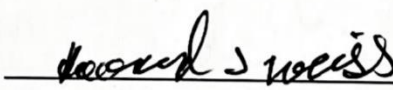
1. The applicant must be a graduate of an HVAC Excellence accredited program in good standing with HVAC Excellence. A current list of accredited programs can be found at:
<https://www.escogroup.org/accreditation/accreditedprograms.aspx>
2. The applicant must successfully pass a series of five HVAC Excellence Employment Ready/Specialty exams within two years of their date of application. These include Electrical, Air Conditioning, Electric Heat, System Performance which covers critical charging, airflow, psychrometrics, and combustion analysis, and one of the following exams (Gas Heat, Oil Heat, or Heat Pumps) within two years of their date of application.
3. The applicant must have graduated with a C average or better.
4. Upon admission to a United Association Local Union's HVACR apprenticeship program, the applicant may be classified as a second-year apprentice and receive up to one year of training credit, in recognition of the critical training received at the accredited program. This is consistent with the apprenticeship program's policies for the awarding of advance credit.
5. The local union's training director may require the apprentice to complete the program's required safety courses, such as OSHA 10, or History courses such as UA Heritage, in addition to the regular advanced placement requirements.

It is the applicant's responsibility to provide all documentation as required for this advanced placement.

This agreement shall be reviewed for modification by a committee consisting of both parties every two (2) years or as required by industry changes. This agreement shall remain in force until such aforementioned changes are agreed upon.


Ray Boyd

Training Director
United Association


Howard Weiss

President
HVAC Excellence, ESCO Group

8/14/2023
Date



Application and Review Process

The following instructions will provide an estimated timeline to complete for each step of the accreditation process. Depending upon your response time, the process may be completed in as little as ninety days or can take as long as one year.

Step 1: Submit Application and Program Video

The school submits their [application](#) and fee for accreditation to HVAC Excellence. In addition, the school shall [submit](#) a narrated program video, highlighting the following:

- Diversity of equipment, trainers, and workstations available in the program's laboratories. (Inside and outside.)
- Fire extinguishers, eye wash stations, first aid kits, emergency cutoff switches, and the mechanical exhaust system in the program's facilities.
- Tool room and storage area, emphasizing the presence of test and diagnostic equipment, recording instruments, general hand tools, vacuum pumps, recovery equipment, brazing equipment, and the designated refrigerant storage area as applicable to the discipline being applied for.
- Training library, which includes audio-visual equipment, books, slides, videos, and other resources.
- Classroom area
- Student computers
- Instructor office(s)

Upon receipt of the application and video(s), the accreditation review board will determine if the program(s) are viable candidates for accreditation. When seeking accreditation of multiple disciplines, please provide separate videos for each program. If candidacy status is granted, the program(s) will be provided with an accreditation manual and will have one year to complete the review process as outlined in the manual.

Step 2: Team Members Assigned

When a program is granted candidacy status, a member of the HVAC Excellence team is assigned to work with the school throughout the process. This team member serves as a point of contact and provides guidance and support to the school during the review period.

Step 3: Submit Self-Study

A completed self-study of the program(s) seeking accreditation should be submitted electronically via the HVAC Excellence [Upload Portal](#). It may also be submitted by shipping the completed self-study on USB flash drives to HVAC Excellence, Accreditation Department, 1350 W. Northwest Hwy, Mount Prospect, IL 60056. If the USB option is selected, please submit three drives, each containing the complete self-study. Once the self-study is received, the accreditation review board will carefully assess the documentation to determine if the program is ready for an onsite evaluation. The review board assessment takes approximately 45 days from the date of receipt of the self-study(studies).

Step 4: Onsite Visitation

If the review board finds the self-study and its accompanying documents acceptable, onsite evaluation assessors, (also referred to as Accreditation Specialists/Surveyors), will be selected. The assessors will work with the institution to schedule the onsite visit. Although the on-site visit is often completed in one day, other factors such as the complexity of the program, and the number of programs being evaluated may affect the amount of time required to complete the visit.

Step 5: Final Determination

Once the assessors complete their evaluation, they will submit their recommendations to the accreditation review board. The review board will carefully assess the recommendations and supporting documentation to make a final determination regarding the accreditation status for each program seeking accreditation. This final decision-making process typically takes up to 45 days.

Accreditation Fees

The accreditation process involves certain fees and expenses. An accreditation fee of \$2,000 (for the first program seeking accreditation) is to be paid as follows:

- A non-refundable fee of \$500.00 is submitted with the [application](#).
- The remaining \$1,500.00 is due after review and acceptance of the self-study but prior to scheduling the onsite visit.
- A fee of \$1,000 will be required for each additional program seeking accreditation.

The following expenses will be invoiced to the institution upon completion of the onsite evaluation:

- \$700.00 daily honorarium per assessor will be charged. Most onsite visits are completed in one day and require two assessors. However, some programs may require additional assessors or time, resulting in additional charges.
- Travel expenses include actual airfare, car rental fees, fuel charges, personal vehicle mileage, baggage fees, airport parking, and transportation to and from the airport.
- Lodging, including the actual expenses incurred for lodging and meals during the onsite visit will be invoiced to the institution.

If the school cancels a scheduled onsite visit, the institution will be held responsible for any fees and expenses incurred due to the cancellation. A future onsite visit will not be scheduled until the fees associated with the cancellation have been paid.

Application for Accreditation

To apply for programmatic accreditation, visit escogroup.org and click the [accreditation](#) link, where you can submit your application electronically.



Onsite Visitation



Morning Conference

This meeting serves as a platform for open discussion among school personnel and the assessors. It provides a forum to ask questions and better understand the onsite visitation process.

School Administrator Interview

This conversation provides insights into factors that impact the program, such as program management, resources, facilities, and overall support from the school administration.

Student Services Interview

This interview entails a discussion about admission standards, student placement records, transcript management, maintenance of health records, assistance in transitioning from school to work, follow-up on employment outcomes, and the availability of financial aid resources for students.

Financial Services Interview

Discussions may cover topics such as the funding sources available to the program, student fees, the process of formulating the annual program budget,

distribution of grants Perkins funds, and other financial considerations relevant to each program's operations and sustainability.

Review Standards with Instructor

The assessor will meet with faculty, students, and members of the program advisory committees. During this time, they will visit the classrooms, laboratories, storage areas, and other relevant areas to validate all aspects of the self-study.

Exit Interview

Upon conclusion of the onsite evaluation, the assessors will once again meet with program instructor(s) and administrators. During this closing meeting, a summary of the assessor's findings will be discussed.

Final Determination

The HVAC Excellence Accreditation Review Board carefully evaluates the self-study(studies) and findings provided by the assessors to make a final decision regarding the accreditation status of each program seeking accreditation. This evaluation process typically takes up to 45 days.

Terms of Accreditation

The maximum accreditation award period from HVAC Excellence is six years. A training program or institution that receives a six-year accreditation will have met or, in many cases, exceeded all the accreditation standards. Schools seeking accreditation of multiple disciplines may be awarded different terms of accreditation for each program.

Compliance Corrections

In cases where compliance issues are identified, the program will be granted a 90-day period during which the issues are to be resolved. If the corrections cannot be resolved within this period, the program may submit an implementation plan detailing how each correction will be addressed and the resolution timeframe. HVAC Excellence reserves the right to accelerate the timeline and request a re-inspection as part of the implementation plan. Failure to submit the required compliance corrections will result in the suspension of accreditation. Re-inspections may require additional travel-related and honorarium expenses that will be paid by the program.

Annual Reporting

Accredited programs must submit an [annual accreditation report](#) by December 1st each year. The purpose of this report is to document any significant changes and ensure the program remains compliant with [accreditation standards](#). Examples of changes that should be reported include adjustments in instructional staff, curriculum updates, program hours, or the relocation of program laboratories.

If the annual report confirms continued compliance, the school will receive confirmation that its accreditation status remains active until the next annual reporting period or the accreditation expiration date, whichever occurs first.

Failure to submit the annual report by the deadline will result in a notice of non-compliance. The program will have thirty days to resolve the issue. If compliance is not achieved within this period, a letter will be sent to the school's chief administrator, notifying them of the intent

to suspend accreditation. If the report is still not received after an additional fifteen days (forty-five days in total), the programs accreditation shall be suspended. Suspension includes the removal of the program's accredited status from the HVAC Excellence website, and the program must remove the accreditation logo from all literature and/or its website.

Programs are exempt from submitting an annual report during their first 12 months and their final 12 months of accreditation.

Disclaimer: HVAC Excellence reserves the right to refuse accreditation if it believes that such accreditation may negatively impact the integrity and purpose of the overall program, even if the program or institution meets the qualifications set forth above. In such exceptional circumstances, HVAC Excellence will refund the application fee to the applying program.

Definitions

Candidacy: Granted to an educational program that has submitted its application, program video, and application fees. Candidacy status is limited to a maximum of one year. Any program that is in candidacy will be granted additional time of one year to complete their self-study if they can show extraordinary issues with compliance.

Notice: Issued by the accreditation review board when it has reason to believe that an accredited program is not in compliance with any of the standards. The program is required to address the stated compliance issues within a specified period or submit an approved plan of action. Failure to demonstrate compliance may result in the suspension of the program's accreditation.

Suspension: When a program fails to resolve compliance issues within the required time after receiving a notice, its accreditation is suspended until the situation is resolved.

Self-Study Instructions

A self-study is a compilation of narratives and exhibits/documentation that demonstrate the program(s) compliance with the established standards. Prior to scheduling an onsite visitation, the HVAC Excellence Accreditation Review Board assesses the self-study. The purpose of the onsite visitation is to verify and further document the information provided in the self-study.

Our goal is to provide a cost-efficient onsite visit, and the quality of the self-study plays a significant role in achieving that process. Self-studies that lack depth or completeness may result in longer and more expensive onsite visits. In such cases, the self-study may be returned to the institution for clarification, additional narratives and/or exhibits.

Instructions for Self-Study Narratives

Please provide comprehensive narratives that describe how your program(s) satisfies each standard and standard sub-section. The narratives should explain, in detail, how each program seeking accreditation meets or exceeds the standard. If applying for multiple disciplines of accreditation i.e., BAS, and HVACR, make certain that each narrative is clearly labeled to identify the discipline it applies to.

It is recommended to approach each standard as a question to be answered: "How does the program meet this standard?" Number each narrative using the corresponding standard and standard sub-section number.

Instructions for Exhibits

Exhibits/documentation can take various forms, such as forms, reports, photographs, letters, minutes, handbooks, catalogs, or specific pages within a handbook or catalog. If multiple exhibits for different standards and/or sub-sections are found in the same document (e.g., a handbook or catalog), only one copy of the handbook or catalog is required for the self-study. In the narrative, indicate the location (e.g., page number) of each exhibit. Since HVAC Excellence requires a permanent record of all exhibits, and information on websites may change over time, it is necessary to print/provide a PDF of the relevant page(s) for inclusion as an exhibit.

If you have any questions regarding the instructions provided above, please contact your assigned assessor.

Submission of the Self-Study

A completed self-study of the program(s) seeking accreditation should be submitted electronically via the HVAC Excellence (call for instructions). It may also be submitted by shipping three USB sticks (each containing the completed self-study) to: HVAC Excellence, Accreditation Department 1350 W. Northwest Hwy Mount Prospect, IL 60056.

Standard 1: Mission of the Program

The mission of the program(s) seeking accreditation and their students shall be clearly stated for each discipline applying for BAS, GMS, or HVACR accreditation.

Standard 1.1 - Mission for Program Students

The program's students shall be trained and educated to the level(s) as described in the program goals, to become gainfully employed at entry level or above. There should be potential jobs available in or near the service area for students of the program.

Standard 1.2 - Program Mission and Description

There shall be a documented program description listing goals for the students of the program(s). This document shall be available to any potential student. A student handbook listing tuition, maintenance fees, special clothing or safety equipment, textbooks, tools, and any other pertinent information must be given to each new student during orientation prior to entering the program. Employment potential for students and technical qualifications of the instructor shall also be included in the student's orientation for each discipline applying for accreditation.

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program(s) comply with each part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 1: A copy of the program(s) mission statement. Please indicate areas or publications that display the program mission statement.
- Exhibit 1.A: A list of potential jobs located near or in the immediate area. This should include names and addresses of companies in the surrounding area that have either employed or could potentially employ the program(s) graduates/completers.
- Exhibit 1.2: A copy of the student handbook and catalog. If these documents are located online, we still require a copy of them along with the URL to show they are publicly accessible. When submitting a self-study electronically, (upload or thumb drive), please enclose a pdf or some type of viewable file.

Standard 2: Administrative Responsibilities

The program(s) instruction and curriculum shall accomplish its goals and mission.

Standard 2.1 - Student Achievement Records

The student shall be awarded a certificate, diploma, or degree after completion. The student records must clearly specify the demonstrated competency level(s) achieved.

Standard 2.2 - Administration Support of the Program(s)

The program(s) must have the full support of the institution's administration. Equipment, facilities, trainers, tools, training materials, special equipment needs, and supplies will evidence said support. Any specialized and new equipment training, or updated instructor training must be supported and documented by the administration.

Standard 2.3 - The Institution's Requirements

The institution's policies concerning attendance and violations, prohibitions, liabilities, safety, parking, or any other pertinent information must be provided to students and staff of the program(s).

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program(s) complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 2.1: A copy of a diploma, certificate, degree, or transcript that clearly specifies level(s) of competency achieved.
- Exhibit 2.2: The line item budgets for the current and two previous years.
- Exhibit 2.2A: Prior year's executed purchase orders for the program(s).
- Exhibit 2.2B: Evidence of instructors and their professional development (Seminars, Classes, Conferences, additional credentials, etc.).
- Exhibit 2.3: The location, by page number, in the student handbook or catalog that displays the institution's policies concerning attendance, violations, prohibitions, liabilities, safety, and parking.

Standard 3: Finances and Funds

The institution shall support the objectives and goals of the program(s) by providing adequate funding.

Standard 3.1 - Student's Fees

Program(s) supported by local governmental entities shall provide required fees and materials as necessary for student achievement.

Programs not funded by governmental entities may require the student to pay any tuition or maintenance fees deemed necessary by the institution. The student shall be responsible for acquiring supplies, safety equipment, hand tools, and special equipment listed in the student handbook.

Standard 3.2 - Annual Budget for Program(s)

The institution shall develop and implement an annual budget for the program(s). The administration shall inform each instructor of all proper and legal procedures for making purchases.

Standard 3.3 - Formulation of Budget

It shall be the responsibility of the institution's administration to prepare an annual budget. The program(s) shall submit an annual program budgetary needs assessment to the administration before preparing the annual budget. The program(s) shall be notified periodically of the available funds.

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program(s) complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 3.1: A copy of tuition, maintenance fees, and a list of the tools required for purchase by students.
- Exhibit 3.2: A copy of the program(s) current annual budget.
- Exhibit 3.2A: A copy of the purchasing procedures.
- Exhibit 3.3: A copy of a periodic program notification.

Standard 4: Student Services



Student services shall maintain student records, administer pre-admission procedures, promote job placement and interviews, and perform follow-ups. Student services should provide post-completion transition assistance.

Standard 4.1 - Pre-Admission Procedures

For Secondary Schools: Student(s) shall be pre-tested to assess reading, math, and language skills.

For Post-Secondary Schools: Student services shall interview and accept/reject a prospective student after the student submits an official application to enter the program(s). The student shall be pre-tested to assess reading, math, and language skills.

Standard 4.2 - Student Medical Information

Student services shall provide students an opportunity to self-disclose any existing medical condition(s) that may require special considerations or accommodations to ensure each student's success and safety. Medical information forms should document information for each student showing any or all allergies, medications, special medical information, and contacts in case of emergency.

Standard 4.3 - Counseling

Student services shall be available for student counseling on a scheduled basis.

Standard 4.4 - Student Transcripts

Student services shall maintain student records for all completers, non-completers, and graduates. Student records shall be maintained in duplicate. Whether print or digital, one copy shall be kept off-site or in a fireproof environment. Both copies shall be maintained in a secure (locked) environment.

Standard 4.5 - School-to-Work Transition

Student services shall assist the instructor(s) in promoting and implementing job placement assistance for completers and/or graduates of the program(s).

Standard 4.6 - Employment Follow-up Procedures (for Post Secondary Schools Only)

Student services shall establish and implement follow-up procedures to monitor the employment success of post completers and/or graduates in the program(s) field. A follow-up shall be conducted within one year after program completion. This information will be used to evaluate the program(s) and aid in determining strengths and weaknesses of instruction. Revisions to the program's curriculum must be considered when follow-up reveals program deficits.

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program(s) complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

Exhibit 4.1: An outline of the student orientation program(s). This exhibit can be a brochure/outline of the Student Services orientation for all new students or a brochure/outline of the department or program(s) orientation.

Exhibit 4.1A: A list of assessment tests used to assess reading, math, and language skills. If program requirements are different from other technical programs, please provide minimum scores for the program(s) admission.

Exhibit 4.2: A copy of the medical information form used to maintain student medical information. If actual forms are used as an exhibit, under no circumstances should any student names or other identifying information be included to ensure privacy. Indicate which school official has been designated as the institution's ADA Coordinator. Provide evidence that students can self-disclose any need for special consideration or provisions to accommodate student success or safety. Provide evidence that new student orientation covers the topic of accommodating special needs for all students.

Exhibit 4.3: A copy of the published office hours for student services for counseling.

Exhibit 4.4: A copy of an executed student transcript form that does not contain the student's name or personal information.

Exhibit 4.5: The process and /or records establishing proof of compliance with student placement and assistance. Exhibits should include actual numbers of students that enter the program(s) and subsequently leave the program as a leaver or completer. It is helpful if reports indicate students that were employed in field, related field, military, unemployed, etc. Most institutional accreditation agencies require member schools to submit this type of information on a yearly report and such reports make good exhibits.

Exhibit 4.6: A copy of your current employer and student follow-up surveys. Exhibits may include actual numbers for each response category or averages for each response category. If completed surveys are used as an exhibit, please redact all personal identifying information.

Standard 5: Program Design

An organized and systematic plan of instruction, aligned with the goals of the program(s), must be used. A listing of objectives and task assignments to achieve the goals must be a major part of the instruction plan.

Standard 5.1 - Program Design

For Secondary Schools: The program design or plan should utilize a curriculum outline that is logically structured and incorporates clearly defined tasks, objectives, and competencies. The curriculum should align with the requirements for entrance into local post-Secondary programs or facilitate articulation between secondary and post-secondary education. The curriculum should also integrate basic skills such as mathematics, reading, communication skills, teamwork concepts, and any other relevant instruction necessary for successful employment.

For Post-Secondary Schools: The program design or plan should utilize a curriculum outline that is logically structured and incorporates clearly defined tasks, objectives, and competencies. The curriculum should be designed to address the workforce needs of the community. Additionally, students should be provided with a syllabus for each course they are enrolled in.

Standard 5.2 - Students Per Instructor

The student-to-instructor ratio should be reasonable to facilitate individualized instruction. In lab/shop classes, the maximum number of students per instructor should not exceed 20. However, in cases where the student-to-instructor ratio exceeds 20 to 1, the use of "Qualified Lab Assistants" is necessary to ensure appropriate support and supervision.

Standard 5.3 - Specialized Training Plan

Well-defined exit points should be established for students who choose to specialize in specific segments of the program(s). Additionally, to meet the specialized training needs of employers in the area, instructors should develop individual training plans that address specific objectives or goals. This supplemental or part-time preparatory training ensures that students are equipped with the necessary skills and knowledge required by local employers. For Bureau of Apprenticeship registered programs, there is no requirement to provide exhibits for Standard 5.3 and 5.3A.

Standard 5.4 - Safety

Safety is of utmost importance and should be integrated into all aspects of the training program from the very start and incorporated throughout the duration of the program(s). During the first week of training, written comprehensive safety instruction should be provided, covering all safety rules and special practices relevant to the program.

To ensure safety compliance, it is essential to provide and require the use of appropriate safety equipment such as eye protection and gloves. Before any student can operate or work on lab equipment, all safety instructions must be thoroughly administered. To reinforce the importance of safety, all students should sign a statement indicating their understanding of the safety procedures covered in each safety lecture or exam. Records of these signed statements should be maintained by the institution for at least seven years, or for a longer duration as defined by the institution's governing board policies. This documentation serves as evidence of the students' acknowledgment and compliance with safety procedures.

Standard 5.5 - Work Ethics & Worker Characteristics

The development of high personal standards among students is an ongoing and integral aspect of their training. Students should be encouraged to adopt work ethics comparable to industry standards. The training program should incorporate the teaching of appropriate work ethics and worker characteristics throughout the duration of the training.

To assess and monitor student progress, continuous evaluation should be conducted, considering attendance, punctuality, completion of assigned jobs, tasks, and lab projects. This evaluation should be reviewed with each student monthly or at

the end of each grading period. Regular feedback and discussion about the evaluation results help students understand their strengths and areas for improvement, contributing to their overall growth and development.

Standard 5.6 - Student Progress Report

For Secondary Schools: The progress of students in the training program should also be consistently and continuously evaluated. Performance evaluations should be included in the student progress report. These progress reports should be provided to each student every grading period. In addition, the grades or performance reports should be regularly forwarded to the sending school. This allows for ongoing communication and ensures that the sending school stays informed about the students' progress in the training program.

For Post-Secondary Schools: The progress of students in the training program should be consistently and continuously evaluated. Performance evaluations should be included in the student progress report. These progress reports should be provided to each student every four months or at the conclusion of each term, whichever is shorter. These reports keep students informed about their performance and provide them with feedback on their progress in the program.

Standard 5.7 - Lab/Shop Performance Standards

The program instructor will be responsible for assigning laboratory projects to all students. The instructor shall compile and archive documentation of all projects and evaluations of student competencies. The instructor shall assign a single grade/score for each performance test. The criterion for evaluation of a student's lab performance shall include established grade values for task times, processes, and outcomes. Prior to each task or project, the student shall be given the standards for acceptable work and graded at the task's completion by the instructor. Students shall be notified of unacceptable work, indicating the good and bad characteristics along with any corrections. The student must prove task competency before advancing to the next task. To ensure the competence of all students, provisions for individuals performing tasks at slower levels should be made.

Standard 5.8 - Student Assessments

Secondary programs must administer nationally recognized, third-party, closed-book, student outcome assessments that cover the following subject areas: electrical, air conditioning, and one of the following heating areas; gas, oil, electric, or heat pump. In addition, it is encouraged that students take the EPA Section 608 Certification Exam.

Post-secondary programs must administer nationally recognized, third-party, closed-book, certifications. These exams must provide a breakdown of competencies and enable comparative analysis. These exams shall cover, at a minimum, the following disciplines:

- **BAS Programs:** building automation technology, electrical fundamentals, and air conditioning or networking.
- **GMS Programs:** duct and envelope testing, heat gain/heat loss, and one of the following: system performance, psychrometrics, or energy auditing.
- **HVACR Programs:** air conditioning, electrical and one of the following: gas heat, oil heat, electric heat, heat pump, hydronics. Additionally, students must take the EPA Section 608 Certification Exam.

Standard 5.9 - Live Work Orders

Live Work Orders refer to repairs or services conducted on equipment brought into the school that is not owned by the school. It is important to note that students should not receive any monetary compensation for work performed on live work orders. Prior approval from the administration is required for outside work projects, and the assigned projects should align with the skill level of the student(s) involved. The instructor plays a crucial role in assessing the educational value and appropriate level of the outside work project before accepting it and assigning it to students. Documentation related to the project should be maintained, including a work order and a disclaimer of liability. Please note that apprenticeship programs do not accept outside projects or live work under any circumstances. Therefore, exhibit 5.9 does not apply in these cases.

Standard 5.10 - Maintenance and Repair Reference Materials

The program(s) shall have service/installation information for all laboratory equipment that is available to students.

Standard 5.11 - Multimedia References and Periodicals

Current program(s) related multi-media reference materials such as textbooks, newspapers, magazines, periodicals, and computer-based programs must be available to students, as well as the instructor. Textbooks and reference materials must include materials written within the past six years. All multimedia materials shall be cataloged (streaming, DVDs, CDs, etc.). A catalog or list of all multimedia reference materials shall include a title, description, and length. The catalog and its listed materials shall be available for student and instructor use.

Standard 5.12 - Multimedia Equipment

Multimedia equipment capable of PowerPoint presentation or equivalent shall be available to enhance the teaching/learning experience.

Standard 5.13 - Program Advisory Committee

The program director or instructor shall appoint a craft advisory committee of at least five people, one member from each of the following: employers, program graduates, manufacturers, distributors, technicians, and contractors. A listing of these members' names, addresses, telephone numbers, and business or business connections shall be available for review. The responsibilities of the committee include observation, advice, and discussion of the program(s), as well as completing the program's Annual Efficacy Review as it relates to the community's future workforce requirements. This committee must meet no less than twice a year. The program director should provide an agenda prior to the meeting. Minutes for each meeting should include a list of attendees, and a description of all discussions and proposals. Minutes shall be retained on file for future reference. The advisory committee's Annual Efficacy Review program shall include the stated mission, curriculum, equipment, lab condition, fees, and testing procedures. Each advisory committee member must sign the Annual Efficacy Review which shall be maintained on file.



Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

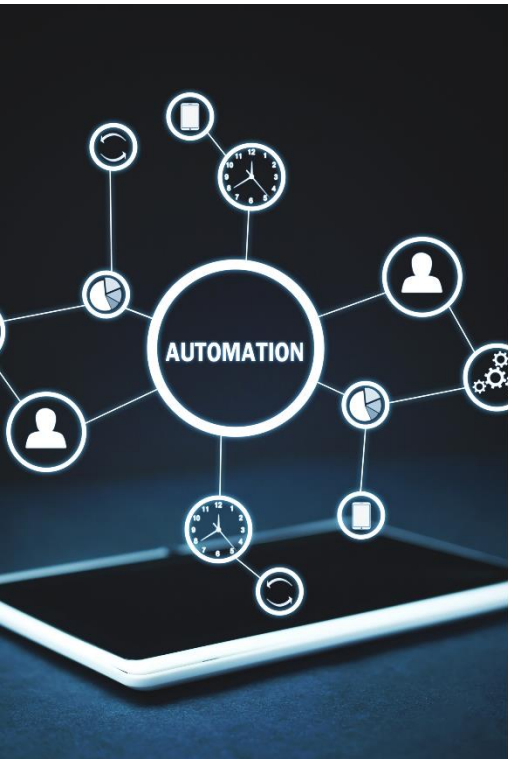
Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 5.1: A detailed copy of the curriculum.
- Exhibit 5.2: Documentation of your student-to-instructor ratio.
- Exhibit 5.3: A detailed copy of your established exit points for completers. *
- Exhibit 5.3 A: A copy of the course outline/syllabus for any supplemental, part-time preparatory training provided within the past year. *
- Exhibit 5.4: A copy of the program safety training outline.
- Exhibit 5.4A: A copy of your student statement of safety understanding.
- Exhibit 5.4 B: A copy of accident and injury reporting forms.
- Exhibit 5.5: A copy of the forms used for student evaluations of attendance, tardiness, completion of assigned jobs, tasks, and lab projects.
- Exhibit 5.6: A copy of the Student Progress Report.
- Exhibit 5.7: A copy of the forms for evaluation of lab projects and performance testing.
- Exhibit 5.7A: A copy of a job assignment used in performance testing.
- Exhibit 5.8: A copy of a retained knowledge (written) exam.
- Exhibit 5.8A: Documentation of program compliance with the national outcome assessment requirement.
- Exhibit 5.8B: Evidence of how students receive EPA (Environmental Protection Agency) certification prior to completion for HVACR programs.
- Exhibit 5.9: A copy of a live work order and disclaimer of liability. Apprenticeship programs do not accept outside projects, "live work," under any circumstances, therefore exhibit 5.9 does not apply.
- Exhibit 5.10: A list and description of laboratory equipment available for training.
- Exhibit 5.11: A catalog or list of all multimedia reference materials.
- Exhibit 5.12: A list of multimedia equipment available for student training.
- Exhibit 5.13: A copy of the last three advisory committee meeting minutes and agenda.
- Exhibit 5.13 A: A list of the advisory committee members. (Include names, addresses, phone numbers, and organizations represented.)
- Exhibit 5.13B: A copy of the duties of the advisory committee.
- Exhibit 5.13C: A copy of the advisory committee's last efficacy review.

* The Bureau of Apprenticeship registered programs do not need to provide exhibits for Standard 5.3 & 5.3A.

Standard 6: Physical Facilities



The program(s) physical facilities shall provide a safe learning environment and provide the means to facilitate the achievement of the program goals and mission.

Standard 6.1 – Safety

Fire extinguishers, first aid kits, and eyewash stations shall be available and accessible in each laboratory. The location and operation of all safety equipment must be included in the curriculum. All classrooms and laboratory work areas must comply with all applicable OSHA (Occupational Safety and Health Administration) regulations. All classrooms and laboratory areas shall comply with local fire codes. There shall be at least 120 square feet of combined classroom and laboratory space per student in the program area(s).

Standard 6.2 - Classroom and Office

The program(s) shall designate a separate area or room as a classroom, providing an environment conducive to learning. The classroom is required to be appropriately illuminated, heated/cooled, and designed to minimize noise and distractions. It shall be equipped with essential teaching aids such as a whiteboard, multimedia equipment, and reference materials. Students shall also have access to computers, with internet access, with a minimum ratio of 1 computer for every 3 students. The instructor office(s) is to be space separate from the classroom, ensuring secure storage of student records and facilitating conference needs. The classroom must be kept clean and orderly.

Standard 6.3 - Maintenance and Housekeeping

The program prioritizes good housekeeping and equipment maintenance to ensure general safety and establish good work habits. These practices are an integral part of the students' training, fostering a safe and productive training environment.

Standard 6.4 - Laboratory Area

Training areas or lab stations shall be in a well-lit separate area, and near the classroom. Workbenches, training mock-ups, and equipment shall be readily available in the shop area. Given the nature of the chemicals used in the laboratory area, the entire area shall be equipped with a permanently installed mechanical exhaust system, and positive ventilation (make-up air) system that meets the requirements as set forth by local building and occupancy codes. The laboratory shall have the necessary utilities and fuel supplies to support the stated curriculum like three-phase power, natural gas, fuel oil, LPG, etc. An emergency cutoff for electrical service shall be required in the laboratory area.

Standard 6.5 - Tool Room and Storage Area

The program(s) maintain at least one storage area adjacent to the lab for storing tools, supplies, and special training equipment. This storage area is secure and conveniently located. Additional storage areas may be designated for equipment not used daily.

Standard 6.6 – Restrooms

The program(s) provide restrooms adjacent to or near the classroom and laboratory area(s) to ensure convenient access for students. The program ensures compliance with the Americans with Disabilities Act (ADA) for restrooms.

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

Note: Exhibits are not required for Standard 6. The physical facilities will be inspected during the onsite visitation.

Standard 7: Laboratory Resources

To meet the goals and fulfill the program(s) mission, training equipment and tools must be available. The equipment and tools must be equal in quality to those used in the industry. The curriculum shall prescribe the equipment and tools required.

Standard 7.1 - Laboratory Equipment and Resources

All programs seeking accreditation shall have high-quality equipment and tools necessary for training in the laboratory. All equipment shall be available for hands-on comprehensive training and performance testing. The curriculum shall dictate the types and variations of equipment or tools needed for training purposes.

In addition to the qualifications listed above, please refer to the additional discipline-specific requirements listed below.

Building Automation Programs

BAS laboratories can be configured with separate computers labs and appliance areas, or can be configured as a single space, creating a combined training environment. Computers should be up-to-date, capable of networking, and able to run graphic-intensive CAD software and simulation applications common to the building automation industry.

Building automation programs must include up-to-date technologies. To keep the program current and relevant, the BAS program shall have equipment manufactured within the past five years, including network devices and media, microprocessor controllers, programmable controllers, electrical controls, and HVACR appliances. At least one piece of functioning live equipment, representative of each phase of the curriculum, must be available.

Suggested Equipment and Resources: Building Automation Programs

- Air handling unit
- Application-specific controllers
- Building controllers
- Cable trays/wiring raceways
- Computer workstations with appropriate software
- Custom application controllers
- Ductless split heat pump
- Economizer system trainer
- Gas-fired and electric-strip-type heat exchangers
- HMI Panel
- Local Area Network (LAN) capable of supporting control system communications and devices
- Zoned duct system
- Medium-temperature, semi-hermetic, air-cooled condensing unit, and evaporator coil
- Network devices that support BACnet, Lon, and Modbus protocols
- Programmable Logic Controllers (PLCs)
- Roof top package-type unit
- Room controllers/operators
- Sensors and controlled devices
- Split-type heat pump system (multi-stage and variable capacity)
- Variable Frequency Drives (VFDs)
- Water loop system
- Water source heat pump

Green Mechanical System Programs

A Green Mechanical System Program may cover topics including but not limited to energy auditing, geothermal, photovoltaic systems, solar heating and cooling, thermal storage, water conservation systems, and wind power. The curriculum shall dictate the types and variations of equipment or tools required for training purposes.

At least one piece of functioning live equipment, representative of each phase of the curriculum, must be available. Tools shall be available in sufficient quantities to ensure students can readily access them, as needed, during the lab portions of the training program.

Suggested Equipment and Resources: Green Mechanical System Programs

- Access to sample and representative residential or commercial structures
- Active solar heating systems
- Air-to-air system
- Air-source, inverter-controlled heat pump system
- Arc flash protection equipment
- Automatic transfer switch (ATS)
- Automated ventilation system
- Backflow prevention devices
- Biofuel-fired boilers and/or furnaces
- Biomass food waste system: food waste to methane, manure to methane, waste food oil burner
- Biomass gasification system: farm field waste, wood chip
- Blower door
- Building automation software/program/system/platform
- Building envelope (shell) trainers/demos/samples (windows, doors, walls, roofs)
- Building information modeling (BIM) software/program/system/platform
- Computer lab with one computer per student
- Condensing boilers and furnaces
- Collector to storage
- Circulating pumps (both magnetic and shaft driven)
- Conservation devices
- Direct digital control (DDC) trainers and/or equipment
- Dual port digital manometer
- Duct-pressurization equipment
- Ductless mini-split heat pump systems
- Economizer with a variety of high-limit controls (fixed enthalpy, fixed dry-bulb, differential dry-bulb, electronic enthalpy, differential enthalpy, and/or dewpoint and dry-bulb)
- Electronically commutated motor (ECM) trainers
- Energy audit software (residential and/or commercial)
- Energy consumption and demand analysis software
- Energy management software/program/system/platform
- Energy recovery ventilators (ERV) – Installed and operational (Enthalpy Wheel)
- Energy modeling software
- Ethanol distillation
- Evaporative cooler
- Evacuated tube system
- Geothermal: heat pump (inverter-controlled) (water source or ground source)
- Geothermal: closed loop systems (horizontal or vertical)
- Geothermal: pond/lake/well
- Green roofing (shading, siting, landscaping)
- Grey water system
- Grid-tied wind turbine rated at 5kw or greater utilizing the local prevailing wind data. Installed in compliance with NFPA 70
- Fuel cell trainers
- Geothermal heat pump system and/or trainer
- Geothermal technology trainers and/or equipment
- Green plumbing fixtures (low-flow, waterless)
- Heat gain/loss calculation software
- Heat pumps (air-source, water-source, geothermal, split-type, packaged)
- Heat pump water heater
- Heat recovery ventilators (HRV) – Installed and operational
- High efficiency and legacy air conditioning equipment
- High efficiency and legacy gas-fired forced-air heating equipment
- High efficiency and legacy heat pump equipment
- High thermal mass systems
- HVAC system with enthalpy controls
- Indirect water heater
- Inverters matched to the array capacity (Individual panel mounted and system-dedicated)
- Lock-out/tag-out (LOTO) equipment and related signage
- Load center and compatible controllers
- Mini-split system
- On-demand hot water system
- Passive solar systems
- Photovoltaic array, at least 2 kw. Installed in compliance with NFPA 70
- Photovoltaic (PV) trainers

- Rainwater collection and retention system
- Refrigerant recovery machine
- Remote leak monitoring sensors
- Smart thermostats – installed on existing equipment and operational
- Solar technology trainers and/or equipment
- Solar water heater
- Step ladder (6')
- Structural components
- Sustainable energy generation technologies
- Thermal energy storage trainers and/or equipment
- Trombe wall system
- Uninterruptible power supply (UPS) system
- Utility meter for grid-tied system
- Vacuum pump
- Variable frequency drives (VFDs) – equipment and/or trainers
- Variable speed drives (VSDs) – equipment and/or trainers
- Waste heat recovery system
- Water-to-water heat pump system
- Water-to-air heat pump system
- Wet/Dry vacuum
- Wind technology trainers and/or equipment

HVACR Technologies Programs

The HVACR laboratory shall house high-quality equipment essential for hands-on comprehensive training and performance testing. In particular, the air conditioning, heating, and commercial equipment should incorporate modern technologies to ensure the program stays current and relevant. The HVACR program should have equipment manufactured within the last five years, including new refrigerants and electrical controls. Additionally, there should be at least one functioning piece of live equipment representative of each phase of the curriculum.

Suggested Equipment and Resources: HVACR Programs

- Blower assemblies (direct-drive and belt-driven)
- Commercial ice makers
- Condensing furnaces
- Cooling tower
- Ductless split air conditioner/heat pump
- Economizer system trainer
- Freezers (walk-in, reach-in, domestic)
- Furnace humidifiers
- Gas-fired and electric-strip-type heat exchangers
- Gas heat and electric heat steam system
- Heat pump systems (min-split, ductless, conventional split, inverter-controlled, packaged)
- Humidifier Self Contained
- Hydronic heating system (Radiant, baseboard, hydro-coil, steam, hot water)
- Low-temperature, semi-hermetic, air-cooled condensing unit and evaporator coil
- Mechanical water tower and pump
- Medium-temperature, semi-hermetic, air-cooled condensing unit and evaporator coil
- Packaged equipment (electric heating, gas heating, cooling, heat pump)
- Water-cooled, semi-hermetic, condensing unit and evaporator coil
- Refrigerators
- Room Air Conditioners
- Self-contained refrigeration systems
- Split-type air conditioning systems (Multi-stage and variable capacity)
- Walk-in cooler and/or freezer with Cam Lock type walls

Standard 7.2 - Laboratory Tools

The program must provide high-quality tools necessary for training. All tools shall be available for hands-on comprehensive training and performance testing. Sufficient tools must be available to accommodate all students during the training program's laboratory portion. The specific furnishing, tools, and test equipment required will be dictated by the curriculum offered by the program.

In addition to the qualifications listed above, please refer to the additional discipline-specific requirements listed below

Building Automation Programs

Suggested Laboratory Furnishing: Building Automation Programs

- Appliance hand truck
- Dollies
- Wet/dry vacuum cleaner
- Workbenches w/vise

Suggested Laboratory Tools: Building Automation Programs

- Anemometer/velometer
- Capacitor tester
- Carbon dioxide (CO₂) test instrumentation
- Carbon monoxide (CO) tester
- Clamp-on Ammeter
- C-clamp set
- Chisel set
- Combination squares
- Combustion analyzer
- Differential Pressure (Magnehelic) gauge
- Digital Multimeter
- Draft gauge
- Driver set; hex, nut, screw (appropriate for electrical and electronics)
- Drill; bit index,
- Drill; electric
- Electronic charging scale
- Extension cords; heavy-duty
- Files
- Flashlight
- Gas analyzer
- Gauge Manifold with hoses
- Hacksaw
- Hammer set; ball peen and others
- Heat gun
- Level; magnetic torpedo
- Manometer
- Micron vacuum gauge
- Nitrogen tank w/regulator and relief valve
- Oil pressure gauge
- Pipe thread tap & die set
- Pipe vise
- Pliers; Diagonal cutting
- Pliers; Linesman, Pliers; Long nose, Terminal crimpers (AWG 10-22 wire size), Tongue and groove, wire strippers
- Pop Rivet set
- Punch set
- Psychrometer (digital)
- Recording ammeter
- Recording voltmeter
- Refrigerant leak detectors (electronic and bubble)
- Refrigerant recovery equipment
- Scratch awl
- Soldering iron
- Tape measure (10ft. or longer)
- Tensioning Plastic Tie-Wrap Tool
- Thermometers (Bi-metallic, Digital, Glass Tube, Chart Recording and Infrared)
- Tin snips Combination set
- Torch kit; oxyacetylene
- Tubing; bender, cutter, flaring set, reamer
- Utility Knife
- Vacuum gauge
- Vacuum pump
- Wattmeter
- Wheel/pulley puller
- Wrenches: adjustable, combination, flare nut, hex key, service valve

Green Mechanical System Programs

Suggested Laboratory Furnishing: Green Mechanical Programs

- Appliance hand truck
- Geothermal system charging cart
- Ground fault protection for extension cords
- Vent hood for soldering and brazing

Suggested Tools: Green Mechanical Programs

When required by ASTM standard F1505, tools shall be rated for 1000-volts.

- Air velocity instruments
- Carbon Monoxide (CO) tester
- Combustion analyzer
- Digital refrigeration gauges
- Digital thermometers
- Droplights
- Dual port digital manometer
- Electric drill
- Flashlight
- Hammer: ball pein, claw, rubber mallet
- Heavy duty extension cords
- High-density polyethylene (HDPE) pipe fusion tools
- Inductive amp probe
- Infrared tester
- Kilowatt meter
- Lock-out/tag-out (LOTO) equipment
- Nut drivers
- Pete's port
- Pipe vise
- Pliers: linesman, locking, needle nose, side cutters, snap ring, tongue and groove
- Portable CO detector
- Refrigeration access port isolation valves
- Safety: glasses
- Safety: gloves
- Screwdrivers: Phillips and slotted
- Solar irradiance meter
- Solar pathfinder
- Tape measure
- Thermal imaging camera
- True RMS multimeter with amp probe
- Vane anemometer
- Wattmeter
- Wire strippers
- Wrenches; adjustable, flare nut torque, Hex key, service valve

HVACR Technologies Programs

The program should include computer tablets equipped with equipment setup and troubleshooting software to enhance the learning experience.

Suggested Laboratory Furnishing

- Air Compressor
- Appliance cart/dollies
- Bench grinder
- Drill press
- Pipe vise table mounted/portable
- Soldering & brazing station
- Sheet metal fabrication machinery
- Wet dry vacuum cleaner
- Workbenches w/ vise

Suggested Laboratory Tools: Green Mechanical Programs

- Adjustable wrenches (8" & 10")
- Air-acetylene torch kit (with assorted tips, check valves and flashback arresters)
- C-clamps
- Cold chisels
- Combination SAE wrench set
- Combination squares
- Drill bits
- Droplight
- Duct board fabrication kit
- Duct crimper tool
- Duct outward cinching staple gun
- Duct Stretcher (16-Inch)
- Electric drill
- Extra manifold charging hoses
- Fiberglass duct hole cutter
- Fan blade and blower wheel puller
- Files
- Fin comb
- Flare/swage set
- Flare nut torc wrench
- Flare nut wrench set
- Flaring set (1/4" to 3/4")
- Flashlight
- Flex duct cutter
- Hacksaw
- Hammer; claw, ball pein
- Heat gun
- Heavy-duty extension cords
- Hex key wrench set; short and long
- Level (magnetic torpedo)
- Magnetic hex drives 1/4", 5/16", & 3/8"
- Nut Drivers 1/4", 5/16", & 3/8"
- Oxy-acetylene torch kit (with assorted tips, check valves and flashback arresters)
- Pinch-off tool
- Pipe thread taps & dies
- Pipe wrenches
- Pliers: diagonal cutting, linesman, long nose, terminal crimpers, tongue and groove
- Pop-rivet set
- Punches
- PVC cutters
- Reciprocating saw
- Schrader valve core tool
- Scratch awl
- Screwdriver; Phillips, slotted
- Service valve wrench (ratcheting, multiple sizes)
- Sheet metal duct hole cutter
- Sheet metal folding tool (12-Inch)
- Sheet metal hammer
- Sheet metal notcher
- Spot welder
- Socket wrench sets (SAE) 1/4" – 3/8" – 1/2" drive
- Soldering iron / gun
- Straight and seamer (3-Inch)
- Swaging tool 1/4" to 3/4"
- Tape measure (10ft. or longer)
- Tensioning plastic tie-wrap tool
- Thermometer pocket type
- Tin snips: combination, straight, left & right-hand cut
- Torch striker
- Torque wrenches
- Tube cutter
- Tubing bender; spring, lever
- Tubing reamer
- Utility knife
- Wheel puller
- Wire stripper

Service Equipment and Diagnostic Tools: Green Mechanical Programs

- Anemometer/velometer with flow hood
- Blower door/duct blaster testing equipment
- Capacitor tester (May be a feature on the digital VOM (Volt Ohm Multimeter))
- Carbon monoxide (CO) tester
- Clamp-on Ammeter
- Combustion analyzer
- Differential Pressure (Magnehelic) gauge
- Digital multimeter (DMM)
- Draft gauge
- Electronic charging scale
- Gas analyzer
- Gauge manifolds (analog and digital, Bluetooth enabled)

- Manometer (Bluetooth enabled)
- Micron vacuum gauge (Bluetooth enabled)
- Nitrogen tank w/regulator and relief valve
- Oil pressure gauge
- Oil Pump
- Psychrometer (digital and sling)
- Recording ammeter
- Recording voltmeter
- Refrigerant leak detectors (A2l, electronic, ultrasonic, UV, bubble)
- Refrigerant recovery/recycling equipment
- Refrigerant storage tanks
- Smoke Tester
- Thermometers (Bi-metallic, Digital, Glass Tube, Chart Recording and Infrared, Bluetooth enabled)
- Vacuum pump
- Wattmeter

Standard 7.3 - Hand Tools for Students

It is suggested that that students obtain the following tools prior to graduation. A tool purchase program should be in a place where the student can obtain tools at a reasonable cost. A listing of necessary hand tools shall be given to each new student by the instructor or by student services.

In addition to the qualifications listed above, please refer to the additional discipline-specific requirements listed below.

Building Automation Programs

- Cable Stripper
- Crimpers; RJ45
- Crimpers; terminal with strippers (AWG 10-22 wire size)
- Flashlight
- Hammer: Ball peen
- Multimeter (with clamp-on ammeter)
- Network Cable Tester
- Nut Driver set
- Pliers: diagonal cutting, linesman, long nose, tongue and groove
- Punch down tool
- Safety glasses
- Screwdriver Set: slotted, Phillips
- Tape measure
- Thermometer (Digital thermocouple type)
- Thermometer (pocket type)
- Tool Bag
- Utility knife
- Work gloves
- Wrench; adjustable, hex

Green Mechanical System Programs

- Drill bits
- Drop light
- Electric drill
- Files
- Fin straightener
- Flashlight
- Gauge manifolds
- Hacksaw
- Hammer: ball pein, claw, sheet metal, soft face mallet
- Multimeter
- Nut drivers
- Pliers: diagonal, linesman, locking, long nose, slip joint
- Punches
- Reamer
- Safety gloves
- Schrader valve core tool
- Screwdriver Set: slotted, Phillips
- Slotted screwdriver
- Soldering iron / gun
- Straight cut tin snips
- Tape measure
- Thermometer
- Tin snips: right-hand and left-hand curve cut
- Tongue & groove pliers
- Tube cutter
- Wrenches: adjustable, Allen, combination, flare nut, hex key, pipe, service valve, socket, Torx (SAE and Metric)

HVACR Technologies Programs

- Adjustable wrenches (8" & 10")
- Flare nut wrench set or Flaring set 1/4" to 3/4."
- Flashlight
- Gauge manifold set with 36" hose minimum with low loss fittings
- Hammer: Ball peen (12oz or larger)
- Hex key wrench set long (9" long)
- Multimeter (with clamp-on ammeter)
- Nut Drivers 1/4", 5/16", & 3/8"
- Pliers Diagonal cutting
- Pliers Linesman
- Pliers Long nose
- Pliers' Terminal crimpers (AGW 10-22 wire size)
- Pliers Tongue and groove
- Safety glasses
- Schrader valve core tool
- Screwdriver Phillips #2
- Screwdriver Pocket Terminal, Flat, & Phillip
- Screwdriver Slotted 1/4", & 5/16"
- Service valve wrench (multi sized)
- Swaging tool 1/4" to 3/4"
- Tape measure (10ft. or longer)
- Thermometer (Digital thermocouple type)
- Thermometer (pocket type)
- Toolbox
- Tube cutter
- Tubing Reamer
- Utility knife
- Work gloves

Standard 7.4 - Supplies

Supplies such as cleaning equipment, towels, and other expendable supplies shall be provided by the program and be readily available. In addition, safety glasses and ear plugs shall be made available for guests of the program. In addition to the qualifications listed above, please refer to the additional discipline-specific requirements listed below.

Building Automation Programs

- Batteries
- Duct tape
- Electrical tape
- Flux
- Fuses
- General cleaning supplies
- Hand cleaner
- Leak Detection Bubble solution
- Lockout/tagout kit
- Network Cables
- Nitrogen
- Pipe dope
- PVC cement and primer
- PVC pipe and fittings
- Rags
- Sand cloth
- Safety Data Sheet (SDS)
- Safety glasses
- Sheet metal screws
- Solderless connectors
- Teflon tape
- Thread sealer
- Wire
- Wire nut

Green Mechanical System Programs

- Batteries
- Electrical tape
- Flux
- Fuses
- Lockout/tagout kit
- Low-voltage wire
- Pipe dope
- Plumbing fittings
- Safety Data Sheet (SDS)
- Safety glasses
- Safety gloves
- Solder
- Solderless connectors
- Teflon tape
- Wire nuts

HVACR Technologies Programs

- Acetylene
- Acid test kits
- Batteries
- Black pipe and fittings
- Carbon dioxide
- Coil cleaning solutions
- Copper tubing and fittings
- Cutting oil
- Duct tape
- Electrical tape
- Flux
- Fuses
- General cleaning supplies
- Hand cleaner
- Leak Detection Bubble solution
- Lockout/tagout kit
- Nitrogen
- Oxygen
- Pipe dope
- PVC cement and primer
- PVC pipe and fittings
- Rags
- Refrigerant
- Refrigeration oil
- Safety Data Sheet (SDS)
- Safety glasses
- Solderless connectors
- Wire nuts

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 7.1: A list of all lab equipment (trainers and live equipment).
- Exhibit 7.1A: Prepare a short, but detailed, video of the program(s) to include the classroom/s and lab area/s equipment and furnishings. Highlight trainers, training modules, training equipment, workstations, safety devices, fire extinguishers, tool room, exhaust systems, etc. The video does not need to be studio quality. A brief narrative as you video the program classroom and lab are appreciated, but not required.
- Exhibit 7.2: A copy of the "student tool purchase program" if applicable.
- Exhibit 7.2A: A copy of the required student tool list.

Standard 8: Cooperative Training

Programs that offer cooperative training, such as shadowing, on-the-job training, externship, internship, etc., must satisfy the requirements of Standard 8.

When offering cooperative training, the program(s) must have a legally written agreement involving all participants. This includes instructor(s), student, work agent, and the administrative office shall be executed before any student participates in any cooperative training program.

Standard 8.1 - Practicum Standards

All students participating in cooperative training shall be under the supervision of an experienced supervisor or instructor while on-the-job. Weekly evaluations, work characteristics (log of actual work performed), attendance, and student's work progress, shall be made by this person. These evaluations shall then be returned to the instructor and to the institution for records and review.

Note: The essence of an apprenticeship program is cooperative training; however, unions simply refer to it as "apprenticeship training."

Self-Study Instructions

Provide a narrative for each Standard sub-section:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit is labeled BAS, GMS, or HVACR.

- Explain how your program complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 8: A copy of any cooperative training agreement.

Standard 9: Instructor Qualifications

9.1 - Instructor Qualifications

All full-time and adjunct instructors teaching BAS, GMS, or HVACR technologies shall:

1. Have a minimum of five years' field experience, directly related to the subject matter covered in their program(s).
2. Meet all criteria as set forth as a technical educator established by your state, local government or authority having jurisdiction over the program.
3. Be able to conduct demonstrations, provide explanations, and convey ideas, concepts, and theories for all aspects of the curriculum.
4. Reflect an image of high ethical values, honesty, tactfulness, patience, and friendliness toward others.
5. Must have earned ONE of the following: certificate, diploma, associate, or bachelor's degree in the discipline being accredited (BAS, GMS, HVACR), or be a graduate of a Department of Labor approved apprenticeship program. Examples of degrees include building automation systems, building science, engineering, environmental science, or HVACR.

In addition to the above requirements:

- Building Automation Instructors must be certified/licensed in low-voltage controls or networking.
- HVACR Instructors must hold a valid EPA Section 608 Universal Certification.

Note: If the HVACR instructor does not meet the qualifications of Standard 9.1 then:

Full-time HVACR instructors are required to hold the title of Certified Master HVACR Educator (CMHE) or be actively working towards earning the CMHE title. This process entails taking a minimum of two credentialing exams per calendar year, with the requirement of passing at least one exam successfully. Moreover, instructors shall have a maximum of 5 years to complete the CMHE program successfully.

Adjunct instructors are required to hold the title of Certified Subject Matter Educator (CSME) in each discipline that directly relates to the competencies they teach. Alternatively, they may be in the process of working towards earning the CSME title for each relevant discipline. To achieve this, adjunct instructors must take the required exams within one year and successfully pass the exam(s) within two years.



9.2 - Continuing Education Requirements

- Be given an annual evaluation conducted by the school administration reviewing the educator's teaching methods, use of developed curriculum guidelines, and implementation of approved curriculum. Annual evaluations must indicate a minimum performance level of "satisfactory" and a copy of the evaluations must become part of the educator's permanent employee file.
- Have a written evaluation completed by all students prior to exiting the program.
- Earn a minimum of ten hours per year of continuing education (1 CEU = 10 Continuing Education Hours). Half of this training must be in the field directly relating to the curriculum being offered. This training shall be provided by manufacturers, associations, and subject matter experts in their field of study. Examples include events hosted by ASHRAE, EGIA, HVAC Excellence, and USGBC.

Self-Study Instructions

Provide a narrative for each Standard sub-section:

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- Explain how your program complies with the part of the standard.
- The narrative is a comprehensive description of how you meet or comply with the standard.

Provide the following exhibits/documentation:

If applying to accredit more than one discipline, it is imperative that each narrative and exhibit/documentation is labeled BAS, GMS, or HVACR.

- Exhibit 9.1: A copy of each instructor's Curriculum Vitae.
- Exhibit 9.2: A copy of each instructor's current certifications and licenses.
- Exhibit 9.3: Copies of all degrees and / or diplomas held by each instructor.
- Exhibit 9.4: Documentation of all continuing education hours (professional development) completed.
- Exhibit 9.5: A copy of the annual evaluation of the instructor.
- Exhibit 9.6: A copy of the students' exit evaluations of the instructor.

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PROGRAM STANDARDS

