Air Conditioning and Refrigeration Program Review Fall 2026

Division 2: Business and Industrial Studies Guided Pathway Division
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Overview of the program

A) A brief Insight along with the mission statement:

The program at Compton College is designed to prepare students for successful entry and advancement in the heating, ventilation, air conditioning, refrigeration, and controls industry. The program combines technical knowledge with hands-on training in installation, servicing, troubleshooting, electrical and electronic controls, wiring diagrams, diagnostic equipment, and energy-efficient system operation. Students are prepared to meet industry standards and pursue opportunities as apprentices or entry-level HVACR and controls technicians.

The program also supports individuals who are already employed in the field by providing opportunities to upgrade their technical skills and stay current with evolving technologies and industry practices. Through its participation in California's Strong Workforce Program and the Los Angeles County Regional HVAC Collaborative, the program emphasizes strong partnerships with local employers, career pathways, work-based learning, and alignment with regional workforce needs.

Mission: The mission of the HVACR Program is to provide accessible, industry-responsive education and hands-on training that equips students with the technical skills, professional competencies, and practical experience necessary to enter, succeed, and advance in the HVACR industry. The program is committed to supporting student success, expanding career opportunities, and preparing a skilled workforce that meets the changing needs of businesses and communities throughout the region.

B) Describe the degrees and/or certificates offered by the program.

A.S. Degree, 1 Major Certificate of Achievement, and 3 Stackable Certificates of Achievements.

Course	Description	Units
ACR 121	Air Conditioning Fundamentals	4
ACR 123	Commercial Refrigeration Applications	4
ACR 125	Energy Efficient Residential, Commercial and Industrial Air Conditioning	4
ACR 127	Heating Technologies	4
ACR 130	Electric Controls	2
ACR 131	HVAC Electronics	2
ACR 134	HVAC Customer Service and Industry Certifications	1
ACR 136	Electrical Applications	4
ACR 160	Refrigeration and Air Conditioning Control Systems	4
ACR 161	Fundamentals of Automation Systems	3
ACR 162	Energy Control and Optimization Systems	4
	Total	**36**

Recommended Electives:

ACR 95 - Cooperative Work Experience Education
BUS 15 - Business Mathematics
CIS 13 - Computer Information Systems

- Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Certificate of Achievement

Course	Description	Units
ACR 121	Air Conditioning Fundamentals	4
ACR 123	Commercial Refrigeration Applications	4
ACR 125	Energy Efficient Residential, Commercial and Industrial Air Conditioning	4
ACR 127	Heating Technologies	4
ACR 130	Electric Controls	2
ACR 131	HVAC Electronics	2
ACR 134	HVAC Customer Service and Industry Certifications	1
ACR 136	Electrical Applications	4
ACR 160	Refrigeration and Air Conditioning Control Systems	4
ACR 161	Fundamentals of Automation Systems	3
ACR 162	Energy Control and Optimization Systems	4
BUS 115	Business Mathematics	3
	Total	**39**

- Certificate of Achievement: Air Conditioning

Course	Description	Units
ACR 121	Air Conditioning Fundamentals	4
ACR 125	Energy Efficient Residential, Commercial and Industrial Air Conditioning	4
ACR 127	Heating Technologies	4
ACR 134	HVAC Customer Service and Industry Certifications	1
ACR 136	Electrical Applications	4
	Total	**17**

- Certificate of Achievement: Air Conditioning and Refrigeration Electric Controls

Course	Description	Units
ACR 130	Electric Controls	2
ACR 131	HVAC Electronics	2
ACR 134	HVAC Customer Service and Industry Certifications	1
ACR 136	Electrical Applications	4
ACR 160	Refrigeration and Air Conditioning Control Systems	4
	Total	**13**

- Refrigeration Certificate of Achievement

Course	Description	Units
ACR 121	Air Conditioning Fundamentals	4
ACR 123	Commercial Refrigeration Applications	4
ACR 134	HVAC Customer Service and Industry Certifications	1
ACR 160	Refrigeration and Air Conditioning Control Systems	4
	Total	**13**

- Stackable Certificates of Accomplishments: Degree & Certificate(s) are stackable to obtain all certificates offered

C) Strategic Initiatives & Program's Mission Fulfillment

Program Overview & Institutional Alignment

The Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) program serves as a critical pillar in fulfilling Compton College's core mission by delivering high-quality, accessible career technical education (CTE). The curriculum is intentionally designed to drive student success, foster economic mobility, and prepare a diverse student body for sustainable employment and long-term career advancement in a high-demand technical sector.

Curriculum Design & Hands-On Training

To maximize student retention and completion, the program integrates robust theoretical instruction with extensive hands-on laboratory experience. Coursework is structured to progressively build technical competencies, ensuring that students transition smoothly from foundational principles to advanced diagnostics. Key elements of this practical training include:

- **Industry-Standard Competencies:** Students gain critical analytical and technical skills aligned with modern regional employer expectations.
- **Embedded Certifications:** Workforce readiness is accelerated through integrated preparation for essential industry credentials, such as EPA Section 608 certification.
- **Experiential Learning:** Lab-based modules allow students to cultivate workplace confidence and problem-solving methodologies directly applicable to field operations.

Equity, Access, and Community Impact

Aligned with the institution's strategic focus on equity and guided pathways, the HVACR program acts as an economic catalyst for historically underrepresented and economically disadvantaged communities. By offering an affordable, community-rooted alternative to costly private trade schools, the program successfully dismantles financial barriers to entry-level professional trades. Through active collaboration with college-wide recruitment and outreach initiatives, the department ensures broad access to stable, family-sustaining careers.

Regional Workforce Responsiveness

Responsive to the dynamic economic landscape of Los Angeles County, the HVACR curriculum undergoes continuous evaluation to reflect shifting industry regulations, technological advancements, and regional labor market trends. By engaging directly with industry standards and field professionals, the program guarantees that graduates possess the immediate, practical proficiencies required by local employers.

Institutional Effectiveness & Continuous Improvement

In adherence to Compton College's standards for institutional excellence, the HVACR program engages in regular, rigorous program reviews. Through systematic assessment of student learning outcomes (SLOs), curriculum audits, and instructional adaptation, the department continuously refines its pedagogy and course delivery methods to uphold the highest standards of academic quality and institutional accountability.

D) Research Data Analysis

Head count of students in the program: Enrollment trends. Break down and description of enrollment by demographic characteristics such gender, ethnicity, age, educational goal, & class enrollment time.

- Table 1: Enrollment by Gender

Gender	Fall '22	Spring '23
Man	100% (13)	91% (10)
Woman		9% (<5)
Grand Total	100% (13)	100% (11)

- Table 2: Enrollment by Ethnicity

Ethnicity	Fall '22	Spring '23
Black or African ..	15% (<5)	45% (5)
Latinx	69% (9)	45% (5)
Unknown/Non-R..	15% (<5)	9% (<5)
Grand Total	100% (13)	100% (11)

By gender, Fall '22 was entirely male (100%), while Spring '23 saw a slight shift with one woman joining the group (9%), though men still made up the large majority (91%). By ethnicity, Latinx participants dominated Fall '22 (69%, n=9), but by Spring '23 the group became evenly split between Latinx and Black or African American students (45% each), suggesting a notable shift in composition despite the small sample size. Overall, with such limited numbers, these shifts likely reflect individual-level changes rather than broader demographic trends.

- Table 3: Enrollment by Age

Age Group	Fall '22	Spring '23
18 to 24	38% (5)	36% (<5)
25 to 29	15% (<5)	18% (<5)
30 to 39	31% (<5)	18% (<5)
40 to 49	15% (<5)	9% (<5)
50+		18% (<5)
Grand Total	100% (13)	100% (11)

The 18 to 24 group remained the largest segment in both terms (38% and 36%), showing relative stability. The 30 to 39 group dropped notably from 31% in Fall '22 to 18% in Spring '23, while 25 to 29 rose slightly (15% to 18%). A new 50+ segment appeared in Spring '23 (18%) that wasn't present in Fall '22, and 40 to 49 declined slightly (15% to 9%). Given the

tiny sample size, these shifts likely reflect just one or two individuals moving between categories rather than a meaningful demographic trend.

- Table 4: Enrollment by Class Load

Class Load	Fall '22	Spring '23
Full-time	15% (<5)	9% (<5)
Part-time	85% (11)	91% (10)
Grand Total	**100% (13)**	**100% (11)**

The part-time students made up the large majority in both terms, and that share grew slightly from 85% to 91% between Fall '22 and Spring '23. Full-time enrollment was already low and declined further, from 15% to 9%. Given the tiny counts involved (under 5 full-time students in both terms), this shift likely reflects just one student's status change rather than a broader trend toward part-time enrollment.

- Table 5: Enrollment by Educational Goal

Educational Goal	Fall '22	Spring '23
Intend to Transfer	100% (13)	100% (11)
Grand Total	**100% (13)**	**100% (11)**

The part-time students made up the large majority in both terms, and that share grew slightly from 85% to 91% between Fall '22 and Spring '23. Full-time enrollment was already low and declined further, from 15% to 9%. Given the tiny counts involved (under 5 full-time students in both terms), this shift likely reflects just one student's status change rather than a broader trend toward part-time enrollment. For their educational goals, 100% of students in both terms reported "Intend to Transfer"— showing complete consistency with no variation across the group in either term.

- Table 6: Grade Distribution

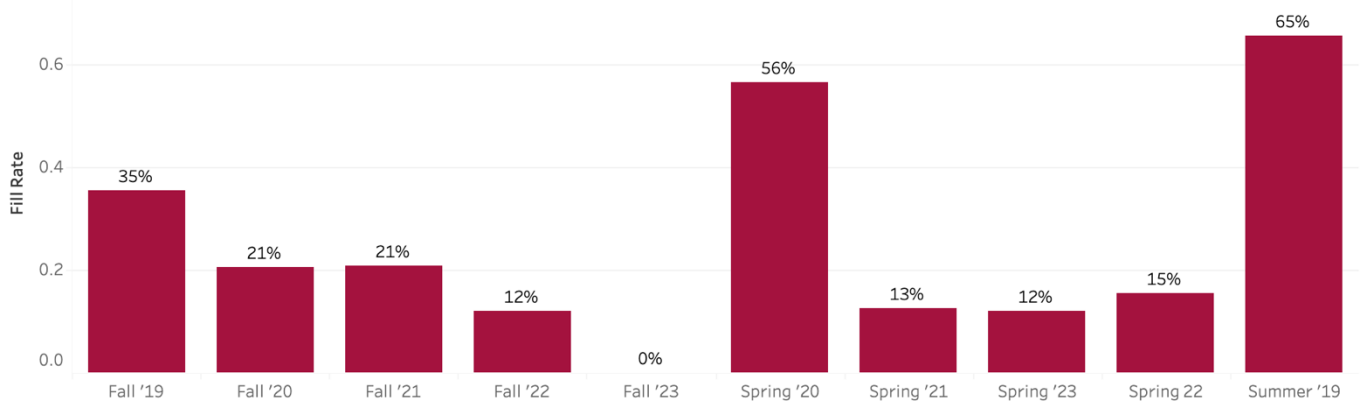
		Final Grade					
Academic Y..	Course	A	B	C	F	W	RD
2022-23	ACR 121	33.33% <5	33.33% <5			33.33% <5	
	ACR 130	50.00% <5					50.00% <5
	ACR 131	66.67% <5					33.33% <5
	ACR 134	20.00% <5	20.00% <5		60.00% <5		
	ACR 136	87.50% 7	12.50% <5				
	ACR 161	44.44% <5		22.22% <5	22.22% <5	11.11% <5	

Overall, students performed well in most ACR courses, with A grades being the most common outcome across five of the six courses listed. ACR 136 stood out as the strongest-performing course, with 87.50% of students earning an A and the remaining 12.50% earning a B — no student received a grade below B. ACR 131 and ACR 130 also showed solid outcomes, with 66.67% and 50.00% of students earning A's respectively, though both courses had a notable share of RD (Report Delayed) grades (33.33% and 50.00%), which may reflect incomplete grading or administrative holds rather than academic performance. ACR 161 had the most even spread of outcomes, with 44.44% earning A's but the remainder split among C, F, and W grades (22.22%, 22.22%, and 11.11% respectively), suggesting a more mixed level of student success. ACR 134 was the weakest-performing course in the group, with 60.00% of students receiving an F — a notably high failure rate compared to the rest of the courses — while only 20.00% earned an A and another 20.00% a B. ACR 121 showed a split outcome, with A and B grades each at 33.33%, but also a concerning 33.33% W (withdrawal) rate, indicating that a third of students did not complete the course. Taken together, the data suggests that while most ACR courses saw the majority of students succeed with A or B grades, ACR 134 and ACR 121 warrant closer attention due to elevated failure and withdrawal rates, and ACR 130/131's RD grades may need follow-up to confirm final outcomes.

- Table 7: Fill Rates

Course	Fall '22	Fall '23	Spring '23
ACR 121	0% (<5)	0% (<5)	20% (<5)
ACR 125			0% (<5)
ACR 130	33% (<5)	0% (<5)	
ACR 131	50% (6)	0% (<5)	
ACR 134	10% (5)	0% (<5)	
ACR 136	0% (<5)		31% (8)
ACR 160			0% (<5)
ACR 161	23% (8)		
ACR 162			0% (<5)

- Fill Rates Chart



Fall '23 stands out as unusual, with 0% across every course listed (ACR 121, 130, 131, 134, and 136), a sharp contrast to Fall '22 and Spring '23 where some courses saw rates as high as 50% (ACR 131) and 31% (ACR 136). ACR 161 also had a notably higher rate in Fall '22 (23%, n=8) compared to most other courses that term. The fill rate trend chart below tells a broader story: rates have generally declined over time, from a high of 65% in Summer '19 to just 0% in Fall '23, with Spring '20 as a notable outlier spike (56%) amid an otherwise downward trend from the high-30% range (Fall '19) to consistently low double digits by 2021-2023. This suggests a long-term decline in fill rates, with Fall '23 marking the lowest point in the entire dataset.

E) Curriculum

- Curriculum course review timeline which ensures all courses are reviewed at least once every 6 years:

Course	Last Reviewed
ACR 95	6/2021
ACR 99	6/2021
ACR 121	9/2020
ACR 123	9/2020
ACR 125	9/2020
ACR 127	9/2020
ACR 130	9/2020
ACR 131	9/2020
ACR 134	9/2020
ACR 136	9/2020
ACR 160	9/2020
ACR 161	9/2020
ACR 162	9/2020

- ACR 95 & 99 reviewed to comply with new standards. DE component added/addressed & hours/units reviewed.
- ACR: 121, 123, 125, 127, 130, 131, 134, 136, 160, 161, & 162 was reviewed, and DE component added. Fixed noted errors or missing information in the COR building tree, added new edition texts, and ensured accuracy of content.
- All course content is regularly updated to reflect evolving industry trends, emerging technologies, and recommendations from the Advisory Committee and HVAC Collaborative. Given the rapid pace of change within the HVAC industry, ongoing curriculum updates are essential to ensure that students receive current, relevant, and industry-aligned training.
- The current ACR course offerings continue to align with identified industry needs and workforce expectations. Recruiting instructors with the specialized industry expertise required for these courses can be challenging, as experienced professionals are often well-compensated in the industry, making traditional instructional compensation less competitive.
- Courses, degrees, and/or certificates are meeting students' transfer or career training needs:

a. Have all courses that are required for your program's degrees and certificates been offered during the last two year?
    i. No.
b. If not, has the program established a course offering cycle?
    i. Yes.
c. Are there any concerns regarding program courses and their articulation?
    i. No.
d. Do students take licensure exams?
    i. Yes, but have not taken it yet.

- **Curriculum Course Review Timeline**

  The HVACR program maintains a structured course review process in full compliance with the six-year review requirement established by the College and the California Community Colleges Chancellor's Office. In coordination with the division's representative to the College Curriculum Committee, the program recently completed a comprehensive course mapping process and updated all active Course Outlines of Record (CORs), establishing a review timeline that extends through 2028.

  As part of this process, all active HVACR courses were evaluated for alignment with current industry standards, student learning outcomes (SLOs), course sequencing logic, and program-level outcomes. The updated course mapper provides a clear, scheduled framework for future COR reviews, ensuring that no course exceeds the six-year review threshold and that updates are initiated proactively rather than reactively.

  Going forward, the program will maintain close coordination with the Curriculum Committee and division representatives to monitor the review schedule, initiate updates as deadlines approach, and revise course content as warranted by changes in industry standards, workforce expectations, certification requirements, and student performance data. This structured approach ensures instructional currency, curriculum consistency, and long-term program sustainability.

- **Course Additions**

  No new courses have been added to the HVACR program curriculum during this review cycle. Since the program resumed in the 2024–25 academic year, the primary focus has been on stabilizing existing course offerings, reestablishing instructional continuity, and delivering current courses effectively within the constraints of existing space and staffing.

  The current course structure continues to align with industry standards and workforce expectations, providing students with the foundational knowledge and hands-on technical skills required for entry into the HVACR field. The recently completed course mapping and COR update process confirmed that existing courses adequately support program learning outcomes and certification preparation without requiring immediate additions to the curriculum.

  As the program stabilizes and capacity grows, potential course additions will be evaluated based on labor market data, advisory committee input, student performance trends, and emerging technologies within the HVACR industry. Any future additions will be pursued through the

established curriculum approval process to ensure they are sustainable, workforce-aligned, and responsive to student demand.

- **Course Deletion and Inactivation**

  No HVACR courses have been permanently deleted from the program curriculum during this review cycle. The program has intentionally avoided permanent deletions in order to preserve curricular flexibility and maintain the capacity to respond efficiently to future instructional and enrollment needs. Retaining courses within the curriculum framework is a strategic decision — it is significantly more efficient to reactivate an existing course than to develop and approve an entirely new one.

  Several HVACR courses have been temporarily inactivated. These inactivations reflect the program's extended period of inactivity following 2021 and ongoing constraints related to laboratory space, equipment availability, and instructional staffing — not a determination that the courses lack value or relevance. Inactivating courses that could not be consistently offered ensured that the college catalog accurately reflected current program availability while preserving the ability to reinstate courses as capacity improves.

  As the program continues to stabilize following its resumption in 2024–25, inactivated courses will be evaluated for reactivation through the curriculum process as space, staffing, and instructional resources allow. This approach supports long-term program sustainability and ensures the HVACR curriculum can expand responsively as institutional capacity and industry demand evolve.

- **Distance Education and Hybrid Course Offerings**

  The HVACR program currently does not offer any courses in distance education or hybrid format. All courses are delivered in a face-to-face modality to ensure that students receive the hands-on laboratory experience essential for technical skill development, equipment safety training, and industry readiness. This delivery model reflects both the nature of HVACR instruction and the documented preferences of enrolled students.

  Student survey data confirm that the majority of HVACR students strongly prefer in-person instruction — particularly for laboratory-based coursework — because it enables real-time instructor feedback, immediate correction of technique, and direct physical engagement with equipment. However, survey responses also indicate that a portion of students would benefit from limited hybrid delivery for theory-based content, concept review, and supplemental learning. This suggests that while fully online delivery is not appropriate for core HVACR courses, targeted hybrid components could enhance scheduling flexibility without compromising instructional quality.

  The program will explore selective hybrid delivery as instructional capacity and resources allow. Any future distance education components will be designed to complement, not replace, in-person laboratory instruction. Hybrid delivery may be considered for lecture-intensive content, exam preparation, or pre-lab instruction — informed by student feedback, SLO performance data, and industry best practices. All future distance education courses will undergo formal curriculum committee approval and appropriate faculty training prior to implementation.

- **Alignment with Student Transfer and Career Training Needs**

  The HVACR program is designed primarily as a workforce preparation pathway. Program courses, degrees, and certificates are structured to provide students with industry-aligned technical skills, hands-on laboratory experience, and preparation for career entry and advancement in the HVACR field. Student survey data and instructional observation consistently confirm that the vast majority of enrolled students have explicit career goals and intend to enter the workforce rather than transfer to four-year institutions.

  Course Offering Continuity

  Due to the program's period of inactivity following 2021 and its resumption in the 2024–25 academic year, not all courses required for degrees and certificates were offered consistently during the last two years. However, the program has established a course offering cycle that prioritizes foundational and core required courses to support student progression. As the program stabilizes, additional required courses will be reintroduced in a planned sequence, guided by the course mapping completed through 2028, to ensure students can complete certificates and degrees in a predictable and timely manner. Resolving laboratory space and staffing limitations remains the primary prerequisite for expanding course availability.

  Articulation

  Formal course-to-course articulation agreements for HVACR-specific technical courses are limited — a circumstance typical of specialized career technical education programs. HVACR courses are not designed for transfer equivalency but may be accepted at other institutions as elective credit in related technical or applied programs. General education courses associated with the HVACR Associate Degree follow standard transfer and articulation pathways. No current concerns regarding articulation have been identified. The program will continue to monitor articulation opportunities and pursue formal agreements where appropriate to support students who may seek advanced training or further education following program completion.

  Degree and Certificate Completion: Goals and Analysis

  Degree and certificate completions during the review cycle have been minimal, a direct result of the program's extended inactivity after 2021 and the fact that students who enrolled following the 2024–25 restart are still progressing through required coursework. Current completion data should therefore be understood as transitional — not as a reflection of instructional effectiveness or student capability.

  Completion Goals

  Based on current enrollment levels, course sequencing, and projected progression timelines, the program has established the following attainable and measurable completion targets for the next review cycle:

  - **5–10 certificate completions per academic year**, achievable within one to two academic years as current cohorts advance through the program sequence

- **2–4 Associate Degree completions per academic year** as students fulfill both core program and general education requirements

These targets reflect realistic expectations given current cohort sizes and capacity constraints, while remaining meaningful as benchmarks for institutional accountability and program planning.

Factors Affecting Attainment

Several structural factors may impact students' ability to complete degrees and certificates on schedule, including limited course availability due to space and staffing constraints, reduced access to required laboratory instruction, and the challenge students face balancing education with work and family obligations. Delayed access to required courses remains the most significant barrier to timely completion — students who are ready and motivated to progress are sometimes unable to do so because sections are not yet available.

Program Modifications Under Consideration

To improve completion outcomes, the program is pursuing the following adjustments:

- Clearer communication of completion pathways and degree maps at the point of enrollment and through ongoing advising
- Structured course sequencing guidance to reduce student uncertainty about progression order
- Supplemental instructional tools to reinforce learning and reduce attrition in technically demanding coursework
- As resources allow, expanded instructional staffing, tool room support, and laboratory access to reduce bottlenecks and support consistent course availability

Completion data will be reviewed annually through the Program Awards Dashboard, Chancellor's Office DataMart, and Compton College Institutional Effectiveness resources to assess progress and refine targets as enrollment and capacity grow.

- **Licensure and Certification: EPA Section 608**

The primary industry-recognized credential associated with the HVACR program is the **EPA Section 608 Refrigerant Handling Certification**, which is required for any HVACR professional who purchases or works with regulated refrigerants. While EPA 608 certification is not a formal requirement for program completion, it is strongly encouraged, actively embedded in curriculum content, and considered an essential career-entry credential for students entering the workforce.

Current Pass Rate Data

Due to the program's period of inactivity following 2021, recent certification pass-rate data is limited. Historically, students who completed program preparation and attempted the EPA 608 exam performed at levels generally consistent with national norms. Industry benchmarks for EPA 608 exam passage typically range from approximately **65–75%**, depending on exam type and student preparation.

Certification Goal

The program has established a target of **75% EPA 608 pass rate** among students who complete certification preparation and attempt the exam. This goal aligns with national performance benchmarks and reflects the program's commitment to both theoretical knowledge and applied exam readiness.

Factors Affecting Pass Rates

Factors that may impact student performance on certification exams include variability in prior academic preparation, limited laboratory access that reduces opportunities to reinforce refrigerant theory through hands-on practice, and the cognitive demands associated with EPA regulatory knowledge, refrigerant properties, and safety requirements. Student feedback indicates strong engagement and motivation but also signals that additional structured review and applied practice would meaningfully improve exam preparation.

Curriculum and Program Modifications

To improve and sustain certification pass rates, the program is implementing and considering the following:

- Integration of EPA 608 preparation throughout the curriculum rather than as a standalone review component, so that exam domains are reinforced progressively across courses
- Increased use of practice exams and diagnostic assessments to identify and address knowledge gaps before students attempt the certification
- Expanded use of simulation-based and scenario-driven learning tools to reinforce refrigerant theory and safety concepts in applied contexts
- As resources allow, adoption of updated training equipment and industry-aligned instructional platforms to align preparation with current exam content and refrigerant technologies

Certification outcomes will be reviewed annually and benchmarked against industry standards to inform ongoing curriculum refinement, with the goal of sustaining or exceeding the 75% target as enrollment stabilizes and more students progress to certification readiness.

- **Student Survey Results**

Overview

Student survey data for the HVACR program was collected through Institutional Effectiveness surveys, with the most recent and comprehensive data drawn from the **Fall 2025 HVACR Student Survey**. During Fall 2025, 32 students were enrolled in HVACR courses, and approximately **47% completed the survey** — a response rate that provides meaningful insight into student perceptions while acknowledging the limitations of a small cohort.

Overall, survey results reveal a program that students find genuinely valuable, instructionally strong, and supportive in its learning environment — alongside persistent, clearly articulated concerns about physical space, equipment, and facilities that constrain the program's full potential.

Survey Results: Student Support

Students reported a high level of satisfaction with instructional support. Survey respondents consistently agreed or strongly agreed that instructors helped them progress toward their academic and career goals, created opportunities for active participation, and fostered a respectful, inclusive learning environment. Students frequently described instructors as knowledgeable, accessible, and genuinely invested in student success. The sense of community within the program was cited as a particular strength — students feel connected to their peers and to their instructors in ways that support persistence and motivation.

These findings indicate that student–faculty relationships and instructional engagement are core assets of the HVACR program and should be sustained and protected as the program grows.

Survey Results: Curriculum

Feedback related to curriculum was largely positive. Students reported awareness of course learning outcomes, indicated that they gained measurable knowledge through program coursework, and valued the connection between technical theory and hands-on laboratory application. Simulator-based instruction and practical exercises were specifically highlighted as effective learning tools.

At the same time, some students identified challenges with comprehension, retention of complex technical concepts, and skill pattern memorization — particularly in areas such as electrical theory and controls. This feedback suggests that while the curriculum is well-structured, additional scaffolding, pre-lab preparation, and structured review components would help students more consistently achieve learning outcomes in technically demanding courses. These findings align with SLO assessment data showing variability in performance between courses with high lab engagement and those that are more concept-intensive.

Survey Results: Facilities, Equipment, and Technology

Facilities, equipment, and technology were the most consistently cited areas for improvement across survey responses — and the findings here are unambiguous. While some students rated equipment and technology access as satisfactory or better, a significant portion of responses identified:

- Limited and congested laboratory space that restricts simultaneous student engagement with equipment
- Difficulty organizing and locating tools during lab sessions, reducing instructional efficiency
- The need for updated, industry-standard equipment that reflects current field technologies
- General facility conditions that limit the program's ability to deliver instruction at the quality students expect and the industry requires

These responses directly validate and reinforce findings documented throughout this program review regarding inadequate lab space, the absence of tool room support, and the need for equipment modernization. Students are not simply expressing preferences — they are identifying structural barriers that affect their safety, learning, and readiness for the workforce.

Survey Results: Program Objectives

Survey results indicate that the HVACR program is effectively communicating and achieving its stated program objectives. A majority of students reported:

- Clear awareness of course-level and program-level learning outcomes
- Measurable growth in HVACR knowledge and technical understanding after completing coursework
- Strong alignment between program content and their career goals and professional aspirations

Student responses further demonstrate that the applied, workforce-focused nature of the program resonates with enrolled students. Most identified clear career intent, and many noted that the program's emphasis on connecting theory to real-world application reinforces their understanding of how coursework translates to industry expectations.

Some students noted the need for additional reinforcement of technically complex material, indicating that while objectives are appropriate and well-communicated, instructional strategies that provide greater repetition and applied practice would strengthen outcome attainment — particularly for students with varying levels of prior academic preparation.

- **Noteworthy Patterns in Student Feedback**

  Survey results reveal two clear and consistent patterns:

  What the program does well: Instructional quality, faculty accessibility, hands-on learning opportunities, and program community are uniformly rated as strengths. Students feel supported, engaged, and aligned with the program's workforce mission. These are not incidental findings — they represent a sustained competitive advantage that should be actively preserved and communicated in recruitment and institutional planning.

  Where improvement is needed: Physical space, equipment organization, and technology currency are the most frequently cited concerns. These limitations are not perceived by students as minor inconveniences — they are identified as meaningful barriers to learning, safety, and professional preparation. The consistency and specificity of this feedback across multiple survey cycles confirms that facilities and equipment concerns represent genuine, unmet program needs rather than isolated opinions.

- **Implications of Survey Results for the Program**

  Student survey results reinforce and validate findings from across this program review in several important ways:

  Curriculum and instruction: Student appreciation for hands-on, applied learning confirms the program's emphasis on face-to-face, lab-based delivery as the right pedagogical approach. Student-identified comprehension challenges align with curriculum findings that point to the need for increased scaffolding and structured reinforcement in theory-heavy courses. The program will

continue to develop pre-lab preparation materials, structured review sessions, and formative assessment strategies to address these gaps.

Facilities and equipment: Student feedback regarding space constraints, equipment disorganization, and outdated technology directly correlates with the program's documented needs for expanded laboratory space, a full-time Tool Room Attendant, and equipment modernization. Students are not simply requesting amenities — they are identifying conditions that prevent them from learning effectively and safely. These findings strengthen the case for prioritizing capital and resource requests as the program's most urgent institutional needs.

Enrollment and retention: Positive perceptions of instruction and program culture signal strong student demand and satisfaction — factors that support retention and word-of-mouth recruitment. However, structural barriers to lab access and course availability limit the program's capacity to convert student interest into persistence and completion. Addressing these structural constraints will have a direct and measurable impact on retention, progression, and completion outcomes.

Resource requirements: Student feedback collectively identifies needs that require institutional investment: expanded lab space, updated equipment, tool room staffing, and additional instructional support. These are not aspirational requests — they are prerequisites for delivering the quality of instruction that students are asking for and that industry demands. The survey results provide student-centered evidence that supports the resource recommendations identified throughout this program review.

- **Other Relevant Surveys**

  No additional formal surveys specific to the HVACR program were administered during the review period beyond the Institutional Effectiveness student survey. This reflects the program's extended period of inactivity following 2021 and the limited timeframe since its resumption in 2024–25, which constrained opportunities for longitudinal or externally administered survey collection.

  In the absence of additional formal instruments, the program has relied on informal feedback gathered through classroom discussion, direct instructor–student communication, lab observations, and individual student check-ins. This informal feedback has been consistent with Institutional Effectiveness survey findings — students express strong satisfaction with instruction and hands-on learning while consistently identifying space and equipment constraints as barriers to their success.

  Additionally, informal industry and employer conversations have reinforced the need for continued alignment with current HVACR technologies, evolving safety standards, and emerging workforce expectations. While not collected through a formal instrument, this industry-level feedback has directly informed curriculum planning, equipment prioritization, and program improvement recommendations.

  As the program continues to grow, the HVACR program plans to implement additional structured feedback mechanisms — including targeted student focus groups and a formal employer feedback process through the advisory committee — to complement Institutional Effectiveness data. These

tools will support a more comprehensive and longitudinal assessment of student experience, workforce alignment, and program effectiveness in future review cycles.

- **Survey Results: Program Objectives (Extended Analysis)**

  Student survey responses related to program objectives are affirming and strategically useful. Students demonstrate a strong understanding of what the program is designed to accomplish, and they report experiencing tangible growth in knowledge and technical competence through their coursework. This alignment between student perception and program intent is a meaningful indicator of curricular effectiveness.

  The strong workforce orientation of enrolled students — with the majority reporting clear career goals or a defined direction — confirms that the program is attracting and retaining the right population for its mission. Students who understand why they are in the program and where it leads are more likely to persist, complete, and enter the workforce successfully.

  Opportunities for continued improvement exist in courses where objectives involve complex technical systems or abstract concepts. The program will continue to refine instructional approaches in these areas — using formative assessment data, SLO results, and student feedback to identify specific points of difficulty and respond with targeted instructional adjustments.

- **Implications of Program Objectives Survey Results**

  The survey results related to program objectives carry several concrete implications for program planning:

  - **Instructional design:** The program's approach — connecting theory to applied practice and clearly communicating learning expectations — is working. This approach should be systematically documented and used as the foundation for onboarding any future instructional staff.
  - **Curriculum review:** Areas where students report comprehension difficulty should be flagged as priority items in upcoming COR reviews to ensure that course content, sequencing, and learning activities are appropriately calibrated to student preparation and learning needs.
  - **Student success:** Strong alignment between student goals and program objectives is a retention asset. The program should leverage this alignment in advising conversations, orientation materials, and early engagement activities to reinforce persistence from enrollment through completion.
  - **Resource advocacy:** Student-reported satisfaction with objectives and instruction, paired with documented frustration about facilities and equipment, provides a clear and compelling narrative for institutional resource requests — the program is delivering quality instruction under constrained conditions, and meaningful improvement requires investment in the physical and operational infrastructure that supports learning.

- **Curriculum Recommendations**

  The following recommendations emerge from program data, student survey feedback, SLO assessment results, workforce trends, and curriculum review findings. Together, they address

instructional quality, student progression, workforce alignment, and long-term program sustainability.

Recommendation 1: Maintain Alignment with Nationally Recognized HVACR Training Frameworks

The program should continue and deepen alignment with nationally recognized competency frameworks, including those established by ESCO and other industry-credentialing organizations. Aligning course content and learning outcomes with national standards ensures graduates possess clearly documented, employer-recognized competencies; strengthens the program's regional credibility and recruitment appeal; and creates a consistent foundation for curriculum review cycles. This alignment also supports future opportunities for formal program recognition, articulation, and partnership development. *Funding required: Minimal — primarily requires faculty time and coordination with the advisory committee.*

Recommendation 2: Expand Structured Experiential Learning Opportunities

The program recommends incorporating at least one structured industry exposure experience per academic year — such as site visits to commercial mechanical rooms, residential HVAC installations, industrial refrigeration facilities, or building automation environments. Experiential learning directly reinforces technical instruction, clarifies career pathways, increases student motivation, and strengthens professional awareness of workplace conditions and expectations. These experiences are particularly valuable for students who have had limited prior exposure to the HVACR industry. *Funding required: Modest — transportation, coordination, and possible site partnership costs. Grant or CTE categorical funding may be applicable.*

Recommendation 3: Strengthen Course Sequencing and Pathway Clarity

As the program rebuilds, clearly defined and consistently communicated course sequencing is essential for supporting student progression and reducing time to completion. The program recommends developing and distributing degree maps and sequence guides at enrollment and through advising, establishing consistent course availability cycles aligned with the 2028 course mapping timeline, and implementing milestone checkpoints to help students track their progress toward certificates and degrees. *Funding required: Minimal — primarily advising coordination and instructional materials development.*

Recommendation 4: Integrate Emerging Industry Technologies into Existing Coursework

The curriculum should continue expanding student exposure to technologies increasingly present in modern HVACR work — including programmable logic controls, building automation awareness, indoor air quality systems, and specialized cooling applications such as data center environments. These topics do not require standalone courses; rather, they can be embedded within existing laboratory and lecture content to broaden student awareness and improve employability across a wider range of career pathways. *Funding required: Moderate — dependent on equipment and instructional materials. May be phased in as resources allow.*

Recommendation 5: Expand Integration of Air Balancing and Energy Efficiency Applications

Air balancing and energy efficiency are central competencies in modern HVACR practice and should be more systematically integrated throughout program coursework. The program recommends embedding airflow measurement, static pressure analysis, duct design fundamentals, and system balancing procedures into existing lab activities across refrigeration, installation, and diagnostics courses. Similarly, energy efficiency principles — including load calculations, equipment sizing, airflow optimization, and system performance diagnostics — should be integrated into lecture and applied learning components to reflect the industry's growing focus on performance optimization and energy compliance. These enhancements strengthen technical depth and workforce relevance without requiring new course development. *Funding required: Low to moderate — primarily instructional planning and potential supplemental equipment for airflow and pressure measurement labs.*

Recommendation 6: Pursue Equipment Modernization and Updated Instructional Technology

Student survey results and faculty observation both confirm that current training equipment does not fully reflect the technologies students will encounter in the field. The program recommends pursuing a phased equipment modernization plan, prioritizing acquisition of systems and controls aligned with current industry standards. Updated equipment directly improves the quality and relevance of hands-on instruction, improves student confidence, and strengthens the program's workforce preparation credibility with employers and advisory committee members. *Funding required: Significant — a formal equipment needs assessment and budget proposal should be developed and submitted in coordination with CTE categorical funding opportunities, Perkins funding, and institutional planning processes.*

Recommendation 7: Maintain Data-Informed Curriculum Planning

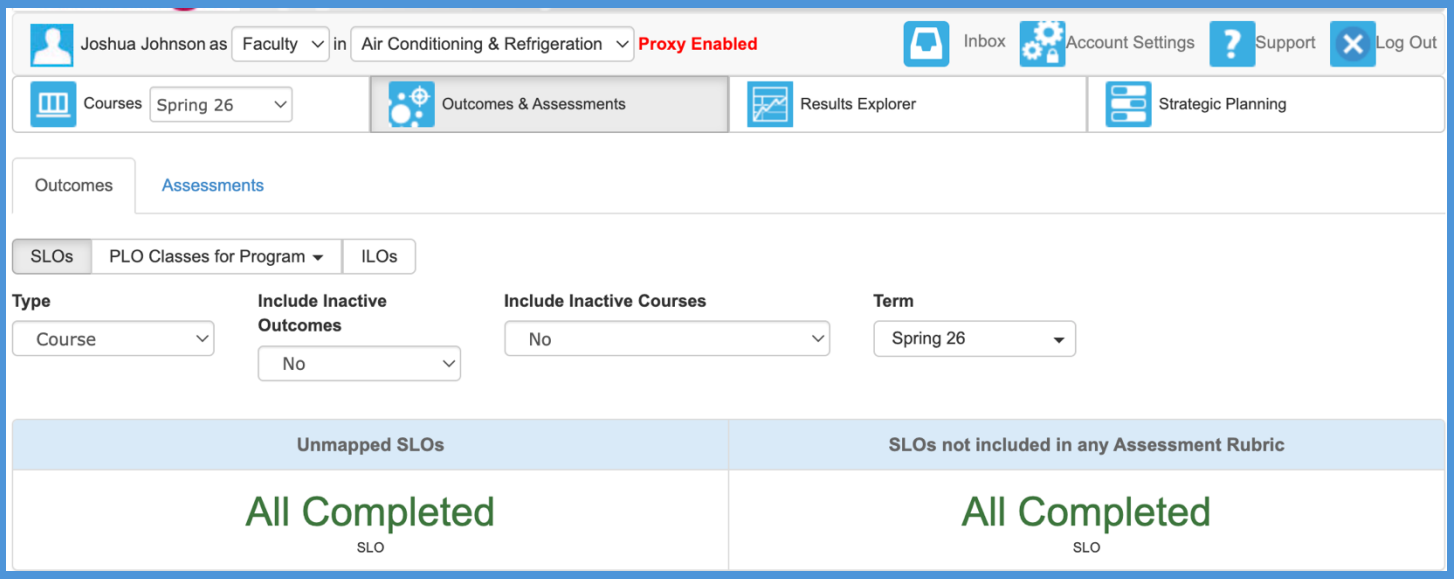
The program will continue to use disaggregated SLO assessment results, student survey feedback, enrollment and completion data, and advisory committee input as the primary tools for ongoing curriculum decision-making. Regular, systematic review of these data sources allows the program to identify instructional gaps, respond to shifts in student need and workforce demand, and demonstrate measurable return on institutional investment through improved student outcomes and workforce placement. This data-informed approach ensures that curriculum remains current, equitable, and aligned with both student goals and industry expectations. *Funding required: None — embedded in existing program review and curriculum processes.*

F) Student and Program Learning Outcomes (SLOs & PLOs)

- Alignment grid, which shows how course, program, and institutional learning outcomes are aligned.
    - Multiple requests have been made for the most recent SLO/PLO grids; however, the updated documents have not yet been provided.
- Provide a timeline for course and program level SLO assessments.

Assessment Name	Assessment Description	Type	Planned Terms	Used In
ACR162 Default SLO Assessment Active since 02/2021	ACR162 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR162
ACR161 Default SLO Assessment Active since 02/2021	ACR161 Default SLO Assessment	Course-ending review of overall student achievement	• Fall 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR161
ACR160 Default SLO Assessment Active since 02/2021	ACR160 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR160
ACR136 Default SLO Assessment Active since 02/2021	ACR136 Default SLO Assessment	Course-ending review of overall student achievement	• Fall 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR136
ACR134 Default SLO Assessment Active since 02/2021	ACR134 Default SLO Assessment	Course-ending review of overall student achievement	• Fall 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR134

ACR131 Default SLO Assessment Active since 02/2021	ACR131 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 • Spring 26 Collapse	• ACR131
ACR130 Default SLO Assessment Active since 02/2021	ACR130 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 Collapse	• ACR130
ACR127 Default SLO Assessment Active since 02/2021	ACR127 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 • Fall 25 Collapse	• ACR127
ACR125 Default SLO Assessment Active since 02/2021	ACR125 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 • Spring 25 • Fall 25 • Spring 26 Collapse	• ACR125
ACR123 Default SLO Assessment Active since 02/2021	ACR123 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 21 • Fall 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 • Fall 25 Collapse	• ACR123
ACR121 Default SLO Assessment Active since 02/2021	ACR121 Default SLO Assessment	Course-ending review of overall student achievement	• Spring 21 • Fall 21 • Spring 22 • Fall 22 • Spring 23 • Fall 23 • Spring 24 • Fall 24 • Spring 25 • Fall 25 • Spring 26 Collapse	• ACR121



- The HVACR program maintains a clear connection between course-level Student Learning Outcomes (SLOs), Program Learning Outcomes (PLOs), and the College's Institutional Learning Outcomes (ILOs). An updated alignment grid has been developed in collaboration with the division's SLO facilitator to document how course-specific outcomes contribute to broader program competencies and institutional learning goals.
- At the course level, SLOs emphasize measurable technical skills and competencies, including safe HVACR service practices, refrigeration charging and diagnostics, brazing procedures, electrical troubleshooting, and compliance with applicable industry regulations. These outcomes support the program's PLOs, which focus on technical proficiency, workplace safety, problem-solving, effective communication, and preparation for employment within the HVACR industry.
- The program-level PLOs are designed to ensure that students completing HVACR certificates or degrees demonstrate competency in essential areas such as refrigerant handling, system diagnostics, safety procedures, technical problem-solving, and industry practices. These outcomes also contribute to the College's ILOs by reinforcing critical thinking, applied technical knowledge, communication, quantitative reasoning, and professional responsibility.
- The alignment grid provides a structured framework showing how each active HVACR course contributes to one or more program-level outcomes and how the PLOs collectively support institutional priorities. This alignment promotes consistency throughout the curriculum, establishes a logical progression of skills from introductory to advanced coursework, and provides a foundation for systematic assessment. As the program continues to rebuild and stabilize following its 2024–25 resumption, the alignment grid will remain an important resource for evaluating student achievement, guiding curriculum improvements, and supporting ongoing program assessment.

- **Timeline for the course and program level SLO assessments.**
    - The HVACR program utilizes a structured Student Learning Outcome (SLO) assessment process to ensure that both course-level and program-level outcomes are evaluated consistently and systematically. Before the program became temporarily inactive after 2021, SLO assessments were conducted according to the College's established assessment schedule. Documented assessment activities include course-level evaluations completed in Spring 2022, followed by renewed assessment efforts during the 2024–25 academic year after the program resumed operations.
    - Following the program's return in 2024–25, an updated assessment schedule has been established to provide a consistent framework for ongoing evaluation. All active HVACR courses will participate in a rotating assessment cycle, with each course-level SLO assessed at least once every three years. Courses offered on a regular or annual basis may be assessed more frequently when appropriate, allowing faculty to identify instructional needs and make timely adjustments. Courses that have previously been inactive will be incorporated into the assessment cycle when they are reactivated and offered.
    - At the program level, Program Learning Outcomes (PLOs) will be evaluated at least once every two years using aggregated results from course-level assessments. This process will provide a broader measure of student achievement across the program, with particular attention to technical competency, workplace safety, certification preparation, problem-solving, and workforce readiness.
    - Faculty will review assessment findings on an ongoing basis to identify patterns in student performance, areas requiring additional support, equity considerations, and opportunities to improve instruction and curriculum. Assessment results will be documented and used to inform instructional adjustments, equipment and resource priorities, curriculum revisions, and other program improvements.
    - This structured assessment framework provides the HVACR program with a consistent process for evaluating student achievement and using assessment findings to support continuous improvement. As enrollment continues to stabilize and course offerings expand following the program's resumption, the assessment schedule will be reviewed and refined as needed to remain aligned with college expectations and ensure that assessment activities continue to contribute meaningfully to student success.

- **Percent of Course and Program SLO Statements Assessed**
    - Since the HVACR program resumed operations in the 2024–25 academic year, the program has reestablished a consistent process for assessing Student Learning Outcomes (SLOs) in courses that are actively being offered. Assessment documentation from recent and prior course offerings, including ACR 121 in Fall 2025 and ACR 162 in Spring 2022, indicates that the SLO statements associated with those courses were assessed during their respective instructional periods.
    - For the courses that have been offered during the current review cycle, **100% of identified course-level SLO statements have been assessed**. This reflects the program's practice of

conducting SLO assessment as courses are offered and ensuring that student achievement is documented through the College's established assessment process.

- Program Learning Outcomes (PLOs) are evaluated through the review and aggregation of course-level SLO assessment results. Because the HVACR program is rebuilding its course offerings following a period of inactivity, not all courses in the full curriculum have been offered consistently since the program's return. Consequently, current PLO assessment is based on the outcomes represented in the courses that have been active during the review period. Within the scope of those offerings, **100% of the applicable PLOs have been addressed through assessment**. As additional courses return to the schedule, the program will expand its PLO assessment data to provide a more comprehensive evaluation of overall program-level achievement.
- The temporary suspension of course offerings following 2021 resulted in a corresponding reduction in assessment activity during that period. Since instruction resumed, the program has restored SLO assessment for active courses and implemented a systematic assessment cycle to ensure that courses are assessed as they are reintroduced. This process will allow the program to build a complete and sustainable assessment record over time while using findings to guide curriculum improvement, instructional planning, and student success efforts.

- **SLO and PLO Assessment Results, Analysis, and Improvements**

  - Over the past four years, assessment of Student Learning Outcomes (SLOs) and Program Learning Outcomes (PLOs) has provided the HVACR program with useful information about student achievement, instructional effectiveness, and areas requiring continued attention. The assessment record reflects two distinct periods: a period of reduced activity associated with the program's temporary inactivity following 2021 and a renewed period of assessment following the program's resumption in 2024–25. As instruction has resumed, the program has reestablished regular assessment practices and has begun using assessment findings more intentionally to inform instructional planning and program improvement.
  - Recent course-level assessment results, including assessments associated with ACR 121 and ACR 162, indicate that students who participate consistently in instruction and laboratory activities are able to demonstrate the expected technical competencies. Areas of demonstrated learning include refrigeration procedures, brazing-related skills, safe service practices, and other foundational HVACR competencies. These results reinforce an important program finding: **consistent access to instruction, structured laboratory practice, and opportunities to apply technical concepts directly to equipment are important factors in student skill development.**
  - One of the most significant instructional lessons identified through assessment is the value of **demonstration followed by structured, repeated practice**. Students tend to perform more consistently when complex procedures are broken into clearly defined steps and demonstrated by the instructor before students attempt the task independently. In response to this finding, instructors have strengthened laboratory delivery by incorporating staged demonstrations, guided practice, additional opportunities for repetition, and clearer visual explanations of technical procedures.

- For example, during refrigeration charging and system setup activities, students are provided with multiple opportunities to practice the procedure under instructor guidance before completing an independent evaluation. This approach gives students an opportunity to correct errors during the learning process rather than waiting until the final assessment. The resulting instructional adjustment has supported greater student confidence, fewer procedural errors, and more consistent execution of technical tasks.
- Assessment has also reinforced the importance of **preparation and safety instruction before students begin hands-on laboratory activities**. HVACR procedures require students to coordinate tools, equipment, materials, safety practices, and technical sequences simultaneously. Assessment and faculty observation have shown the value of providing students with a clear understanding of the workflow before beginning a task.
- In response, instructors have strengthened pre-laboratory briefings and incorporated more detailed walkthroughs of tool preparation, equipment setup, procedural sequencing, and safety checks. This change has helped students enter laboratory activities with a clearer understanding of expectations and has reduced time spent correcting basic procedural misunderstandings. More effective preparation also allows a greater portion of laboratory time to be devoted to skill development and troubleshooting.
- At the program level, reviewing course-level assessment results has provided insight into how individual skills build upon one another throughout the HVACR curriculum. The program has learned that **continuity, sequencing, and reinforcement of foundational competencies are particularly important to student success**. Students are better positioned to succeed in advanced HVACR coursework when foundational electrical, refrigeration, safety, and diagnostic concepts have been sufficiently reinforced in earlier courses.
- This finding has influenced instructional planning and the program's approach to course sequencing. Faculty continue to emphasize foundational skills early in the curriculum and reinforce previously learned competencies as students progress into more advanced technical applications. Maintaining a logical progression from introductory concepts to increasingly complex installation, diagnostic, and service activities provides students with a stronger technical foundation and supports the development of confidence as they advance through the program.
- Assessment has also highlighted the importance of **clear communication of learning expectations**. Students benefit when they understand not only what task they are performing, but also why the task is important and how it connects to broader program and workforce competencies. As a result, instructors have increased attention to communicating SLOs through course materials, syllabi, classroom discussions, and laboratory instruction. Connecting individual laboratory activities to specific learning outcomes helps students recognize the purpose of each activity and better understand the competencies they are expected to demonstrate.

- **Impact on Student Learning and Program Effectiveness**

  - The changes resulting from SLO and PLO assessment have primarily focused on improving the consistency, structure, and effectiveness of hands-on instruction. The program has incorporated

more deliberate demonstrations, guided practice, repeated skill development, pre-laboratory safety preparation, and reinforcement of foundational competencies.

- The impact of these changes is reflected in more consistent student performance during technical activities, improved readiness for laboratory exercises, reduced procedural errors, and stronger reinforcement of safe work practices. While the program continues to build a larger body of assessment data following its restart, current results and faculty observations indicate that students benefit from a structured instructional approach that provides multiple opportunities to observe, practice, receive feedback, and demonstrate competency independently.
- Assessment has therefore served not simply as a reporting requirement, but as a mechanism for identifying effective instructional practices and determining where adjustments can improve student learning. The program has learned that technical competency develops most effectively when students receive consistent instruction, sufficient hands-on practice, immediate feedback, and clear expectations regarding safety and performance.

- **Faculty Review and Use of Assessment Results**

  - Since the program's restart, faculty have renewed their focus on reviewing assessment information and using results to inform instructional decisions. Assessment findings are discussed through course planning, instructional preparation, program discussions, and end-of-term reflection. Given the program's current size, these discussions may occur informally as well as through scheduled planning activities; however, they provide opportunities for faculty to compare observations, identify recurring student challenges, and consider appropriate instructional responses.
  - The program intends to strengthen this process further by creating more consistent opportunities for documented discussion of assessment findings and the actions taken in response. This will provide a clearer record of the relationship between assessment results, instructional changes, and subsequent student outcomes.

- **Student Awareness of Learning Outcomes**

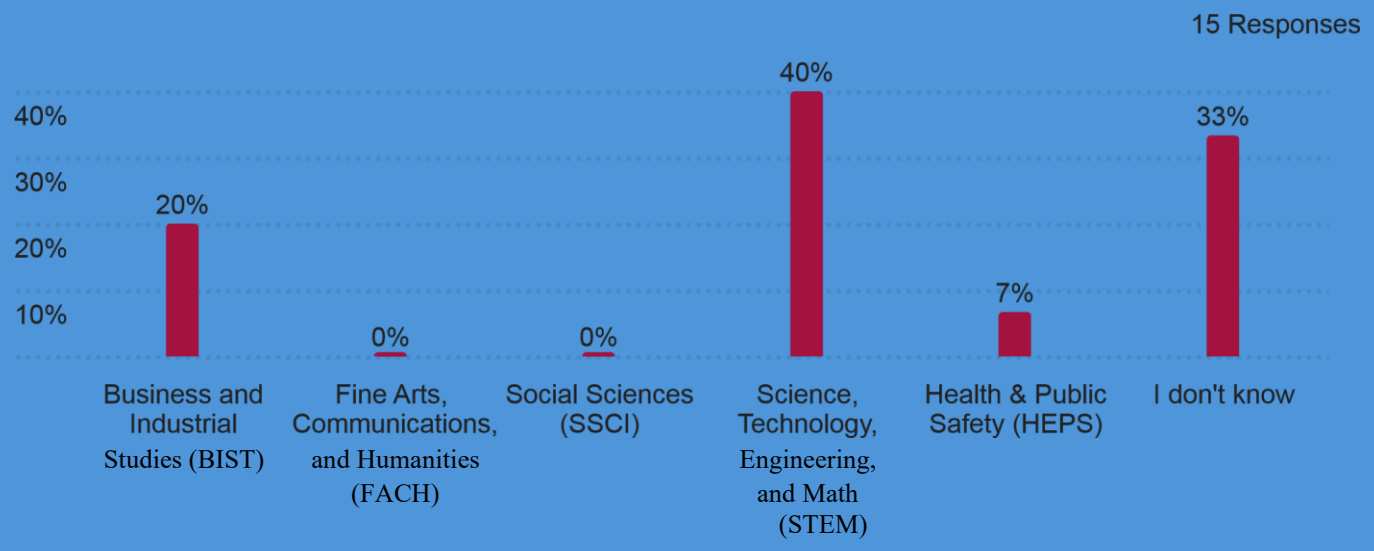
  - The program is also working to ensure that students understand the outcomes they are expected to achieve. Course-level SLOs are communicated through course outlines, syllabi, classroom instruction, and laboratory activities. Faculty reinforce these outcomes during hands-on exercises so that students can connect individual technical tasks with larger course and program competencies.
  - Increasing student awareness of SLOs helps students better understand the purpose of assignments and laboratory activities and encourages them to take greater ownership of their learning. It also helps establish a direct connection between classroom performance and the technical competencies expected in the workplace.

- **Tabulation and Ongoing Assessment**

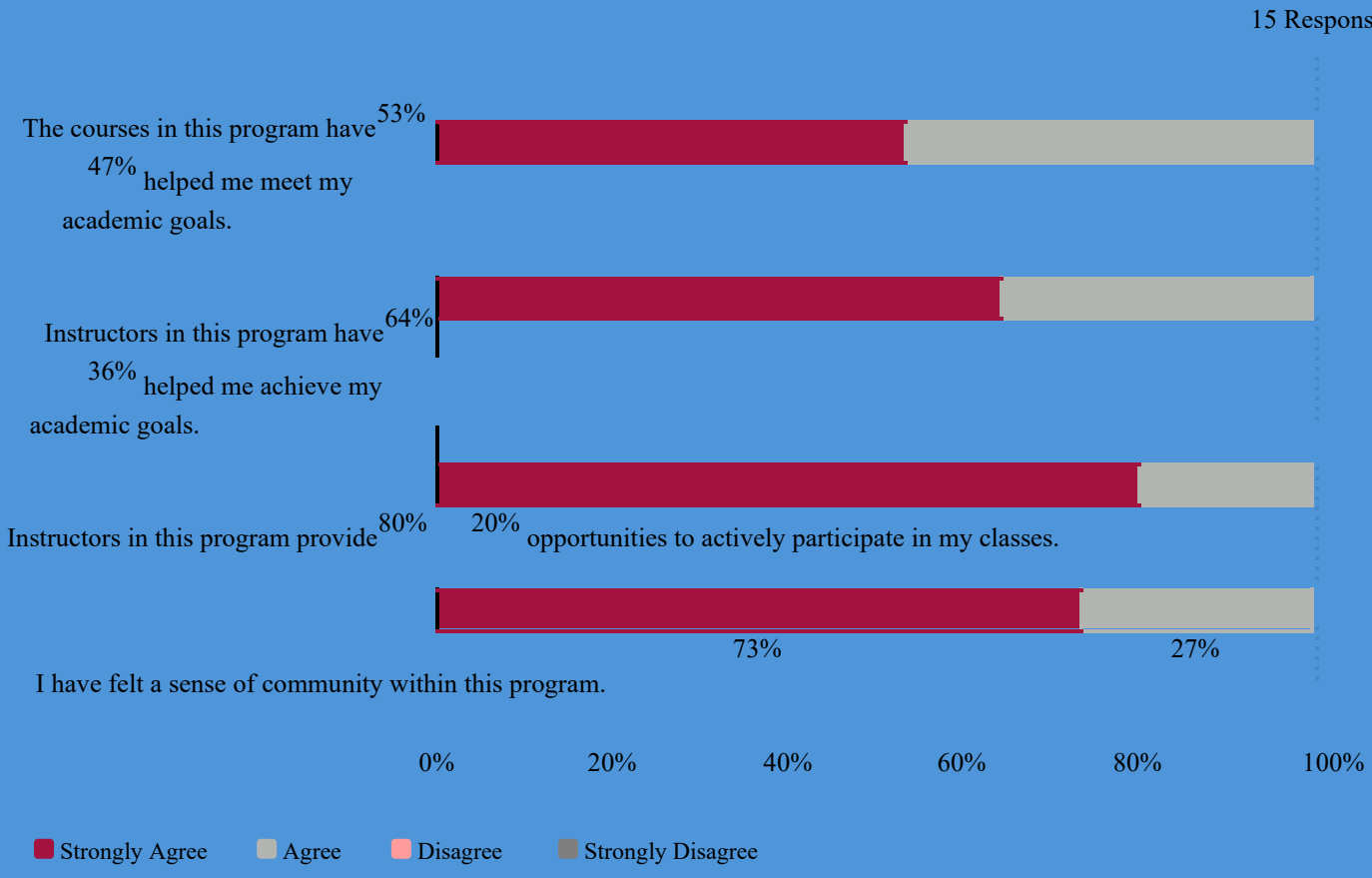
    - The HVACR program has reestablished its SLO and PLO assessment process following the program's resumption and is working toward a consistent, sustainable assessment cycle. Course-level outcomes are assessed as courses are offered, while program-level outcomes are evaluated through the aggregation and review of course-level assessment information.
    - As additional courses return to the schedule and enrollment stabilizes, the program will continue expanding its assessment data and strengthening the documentation of results. Particular attention will be given to identifying trends in student performance, evaluating the effectiveness of instructional changes, and determining whether additional modifications to curriculum, laboratory activities, equipment, or student support are warranted.
    - Moving forward, the program will continue to use assessment results as an ongoing improvement tool rather than treating assessment as a one-time reporting activity. The program's goals are to maintain consistent assessment documentation, strengthen faculty dialogue regarding results, communicate learning outcomes clearly to students, and establish a stronger connection between assessment findings and specific instructional or programmatic actions.
    - Overall, the SLO and PLO assessment process has helped the HVACR program identify several key factors that contribute to student success: **consistent instructional access, structured demonstrations, repeated hands-on practice, strong safety preparation, reinforcement of foundational skills, and logical progression through the curriculum**. Continuing to apply these findings will support improved student learning, strengthen program effectiveness, and help ensure that graduates develop the technical competencies necessary for successful transition into the HVACR workforce.

G) Analysis of Student Feedback

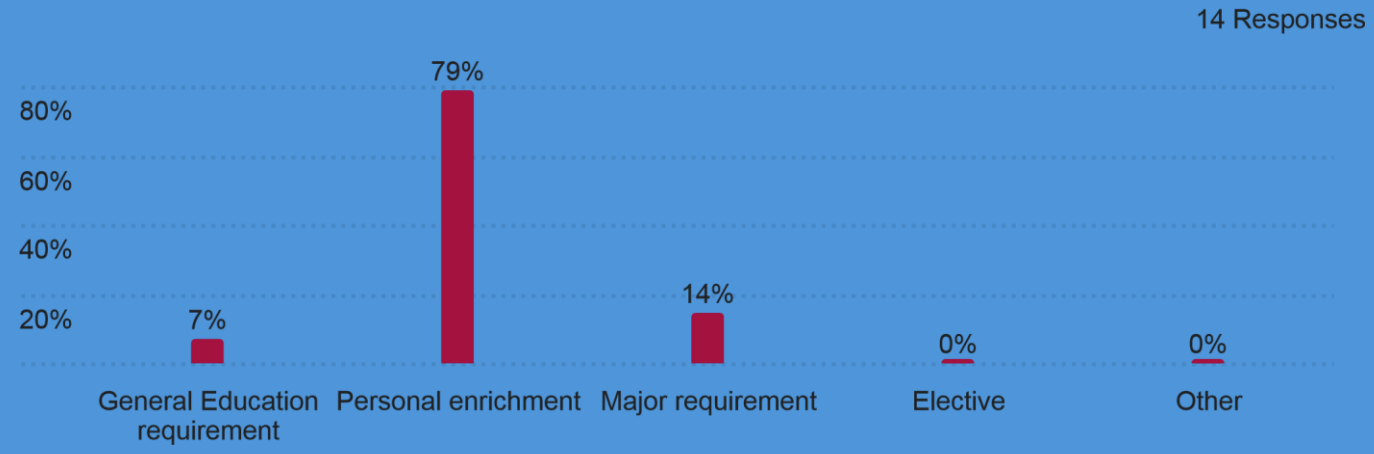
Of the 32 students registered for Heating, Ventilation, A/C, and Refrigeration courses during the Fall 2025 term, 47% completed the survey.



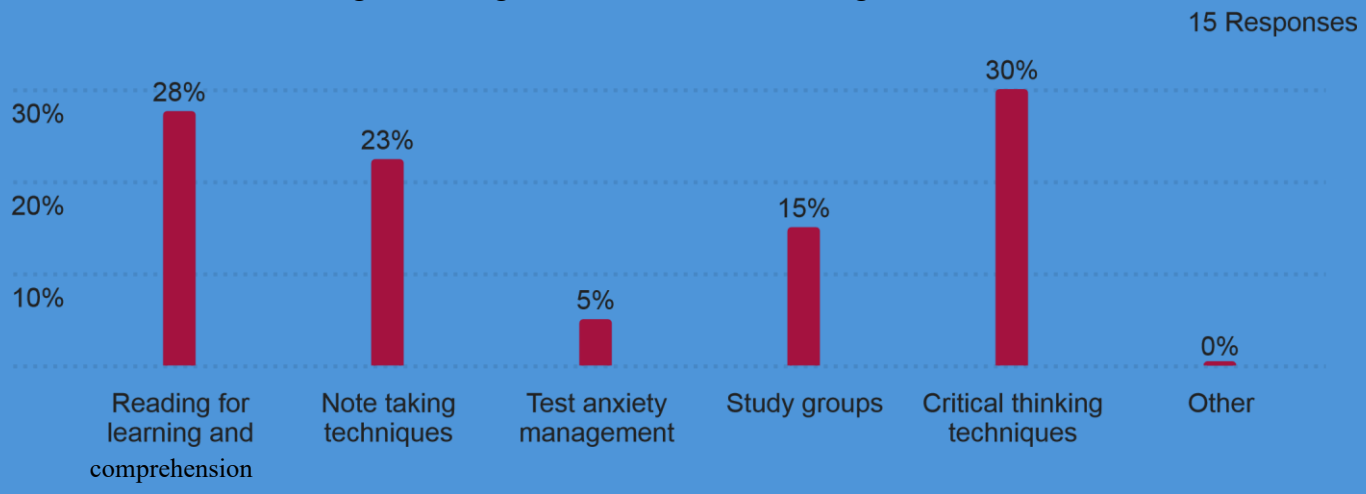
Academic Support and Development in Heating, Ventilation, A/C, & Refrigeration



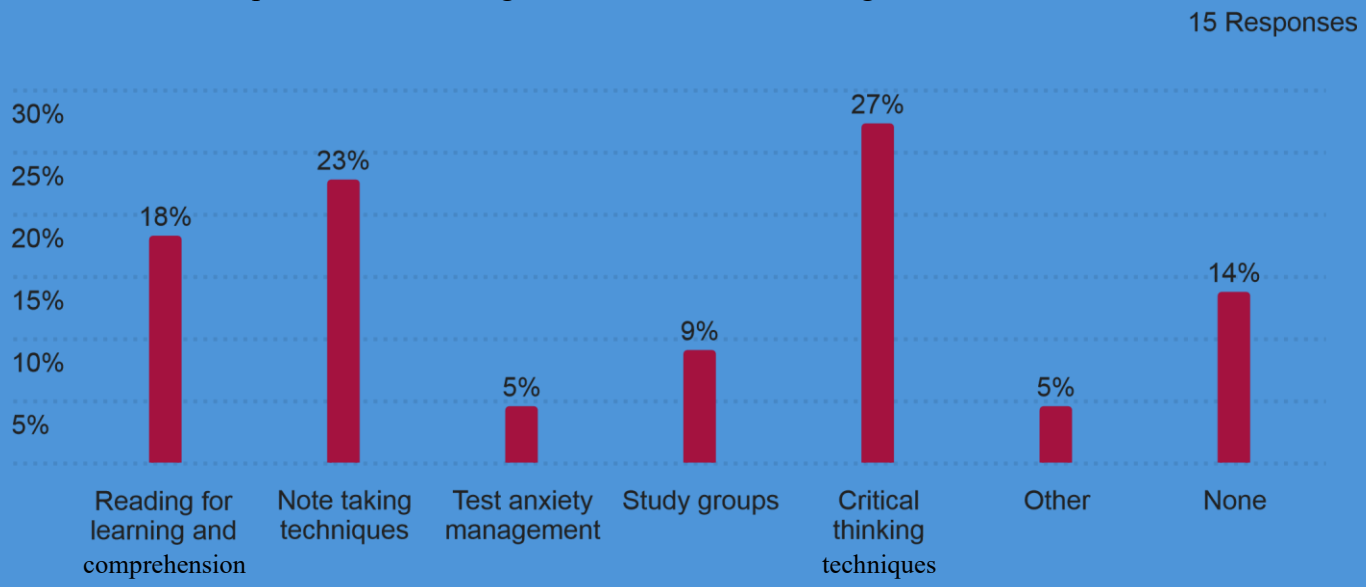
Major Reason for Taking Heating, Ventilation, A/C, & Refrigeration Classes



Skills Essential to Succeeding in Heating, Ventilation, A/C, & Refrigeration Classes



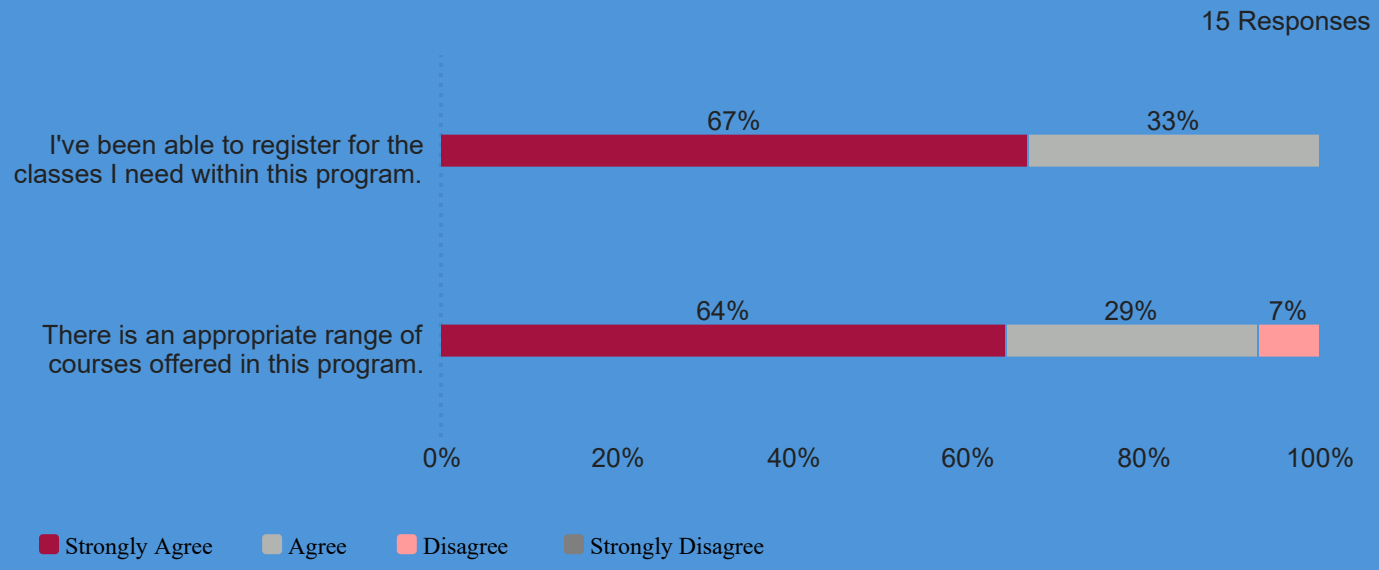
Skills with More Help Needed in Heating, Ventilation, A/C, & Refrigeration Classes



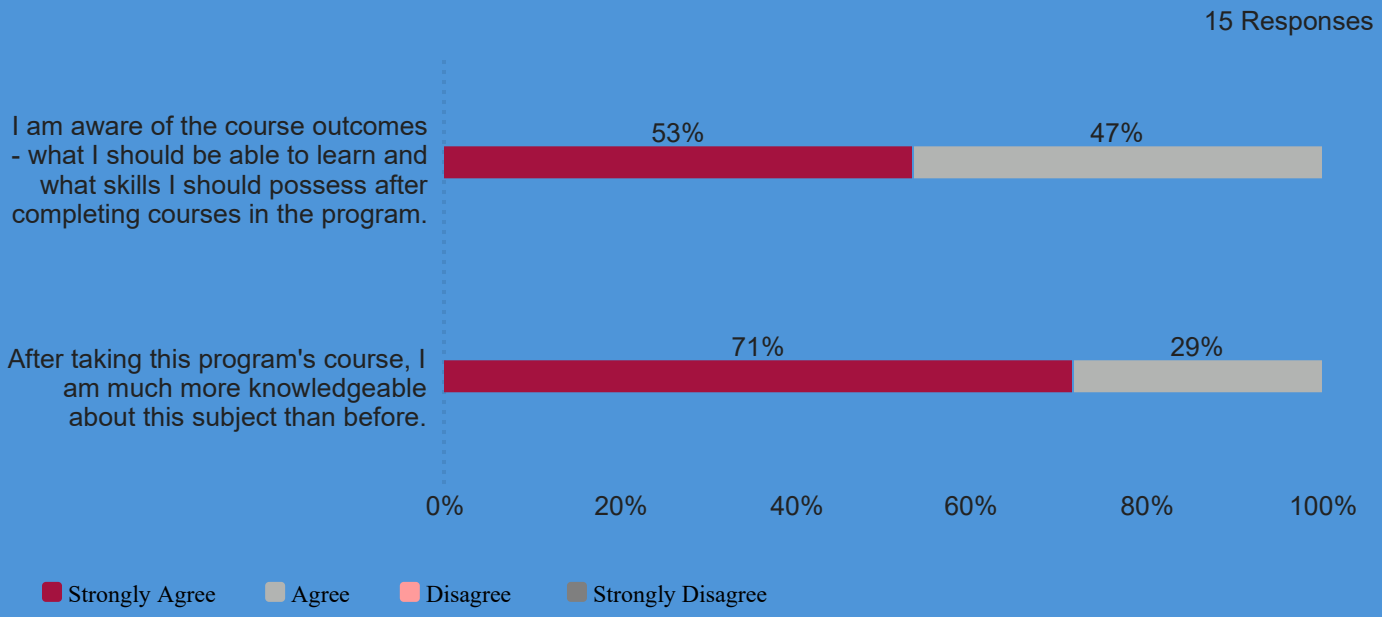
Other skills with more help needed in Heating, Ventilation, A/C, & Refrigeration classes: Memorizing and remembering skill patterns

1 Response

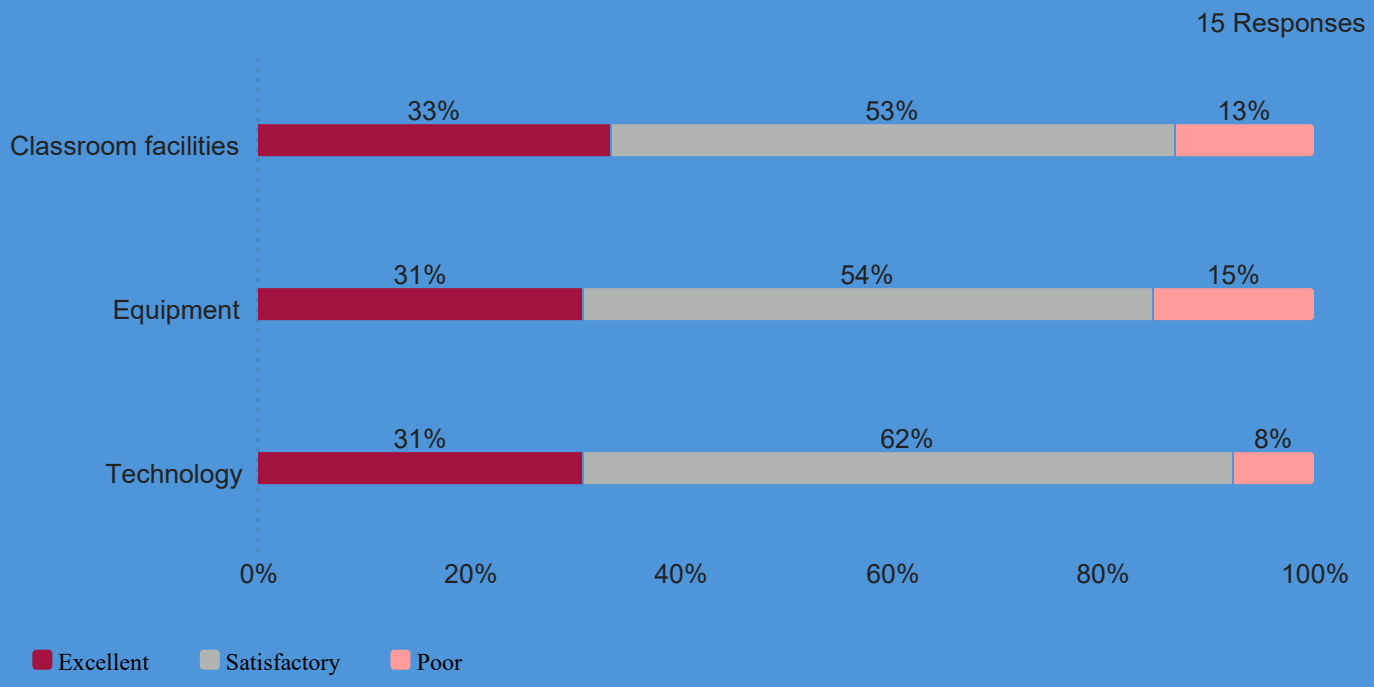
Heating, Ventilation, A/C, & Refrigeration Course Offerings



Skills After Heating, Ventilation, A/C, & Refrigeration Courses



Rating of Facilities, Equipment, and Technology for Heating, Ventilation, A/C, & Refrigeration Courses



Likes or Dislikes about the Facilities, Equipment, or Technology Used for Heating, Ventilation, A/C, & Refrigeration Classes

8 Responses

All new equipment

Teacher is helpful and very knowledgeable, relatable and respectful. He has a lot of resources.

Facility needs upgrades and janitorial attention

I like all of it

Very little space to locate and organize the different equipment and tools.

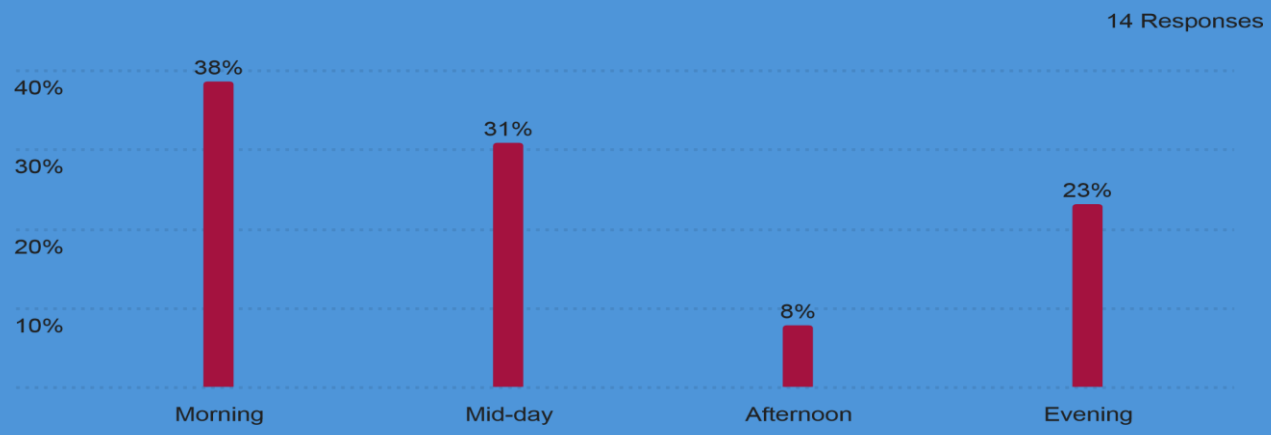
It’s okey everything

Everything is pretty cool and easy to use so I can't really complain about the tools that we have if anything I'm grateful we get to use some of them tools to get hands on and learn faster.

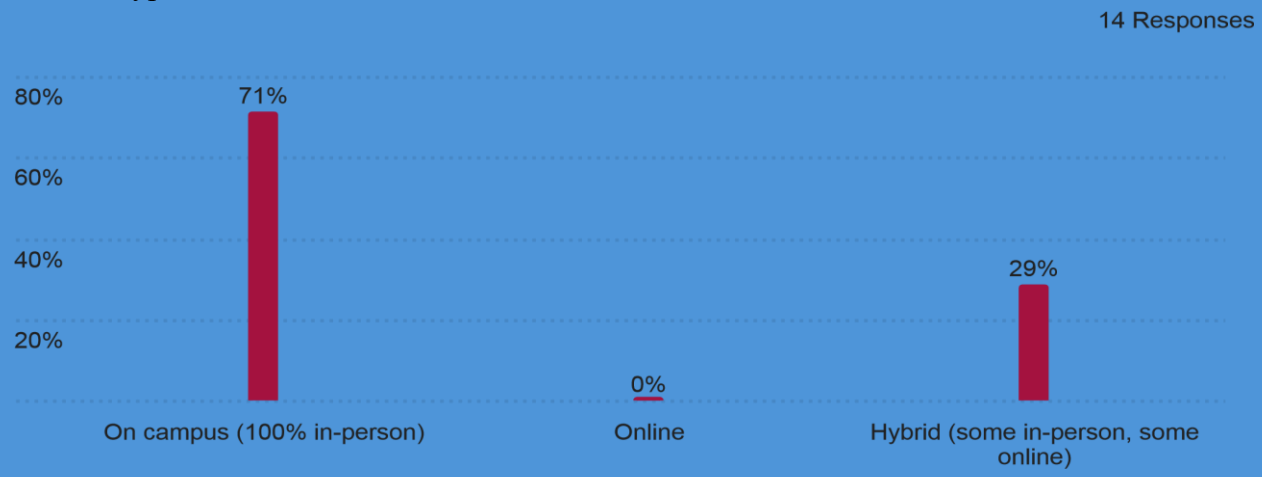
The Opportunity To Apply the technical theory to practical Hands On Application In Lab on the simulators and hot room

Educational Preferences

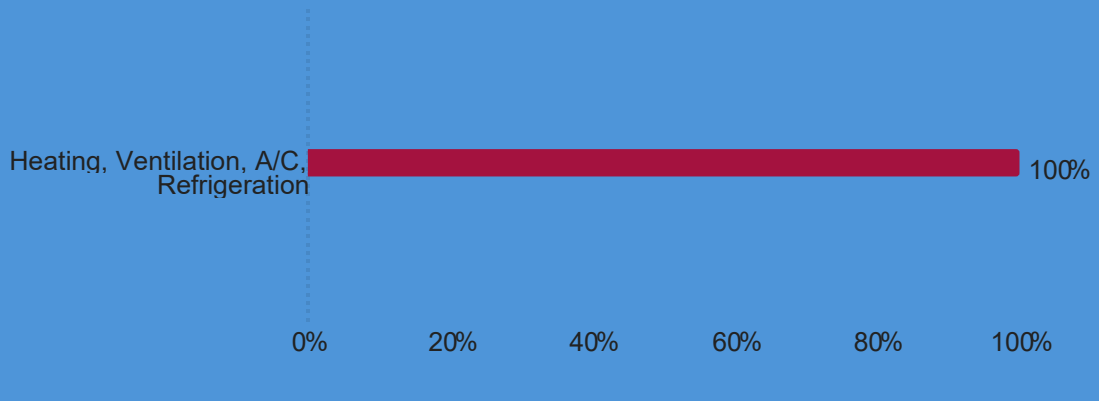
Preferred Time to Take Courses



Preferred Type of Course

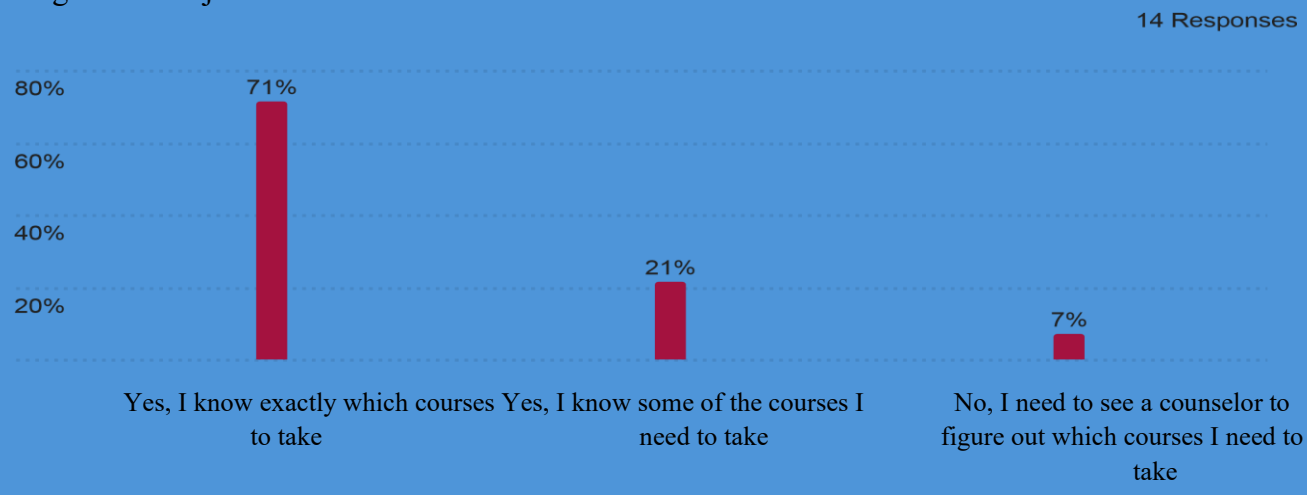


Study Information: Student Major

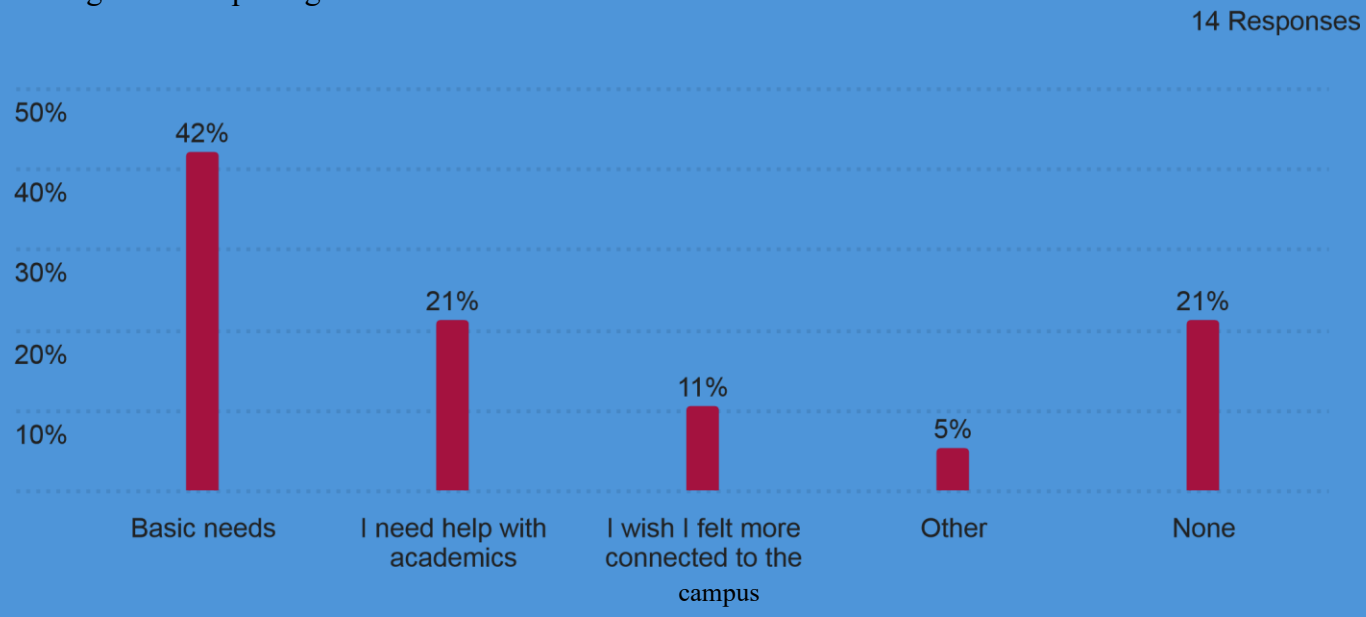


14 Responses

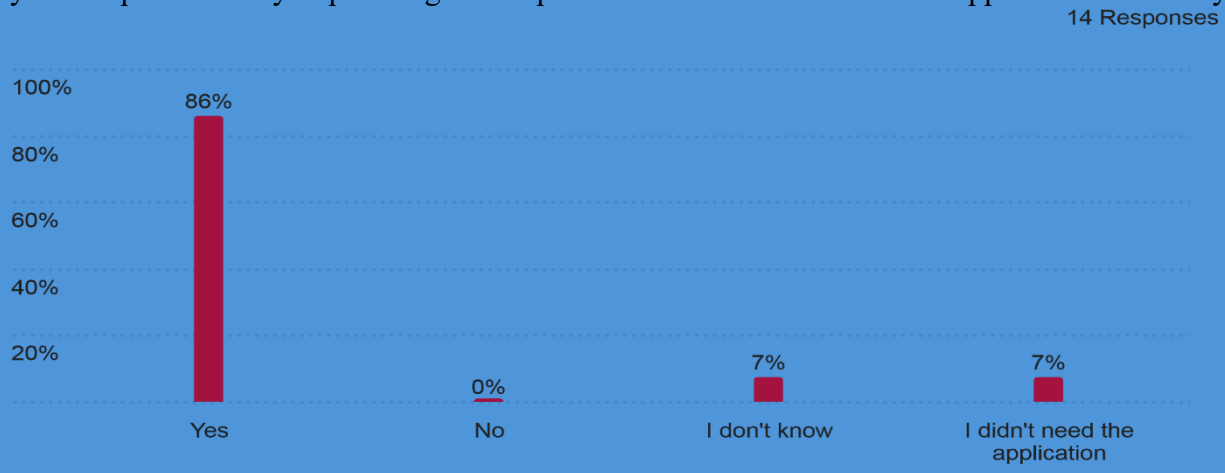
Do you know which courses you have to take to complete your goal in the Heating, Ventilation, A/C, & Refrigeration major?



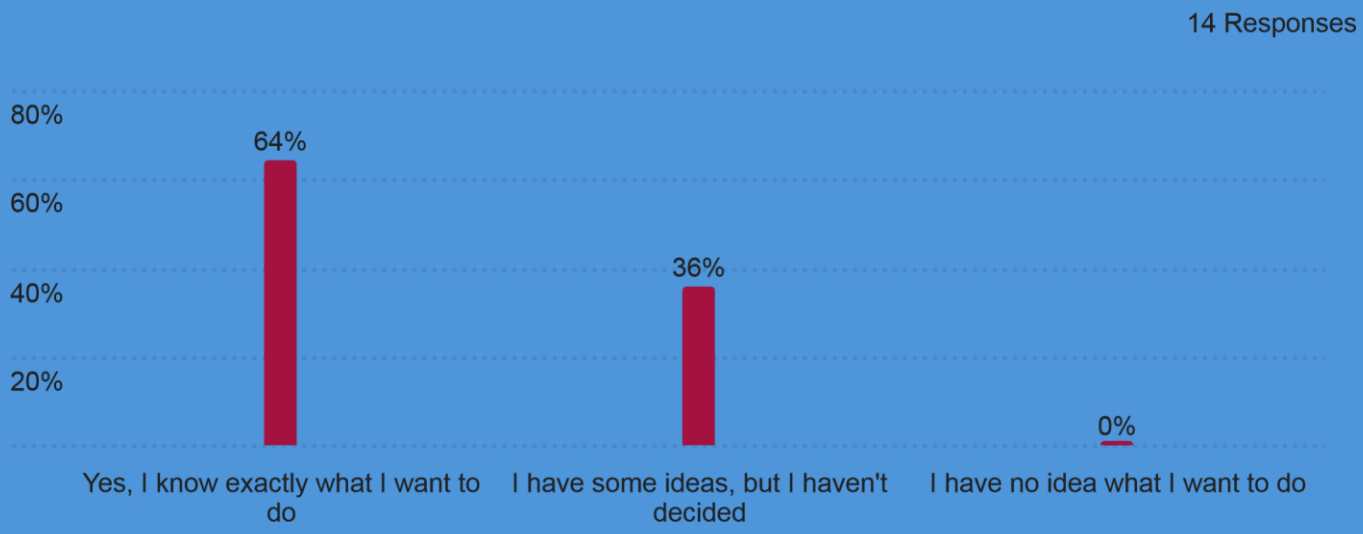
Challenges in Completing Studies



Did you complete or are you planning to complete the FAFSA or Dream Act Application for next year?

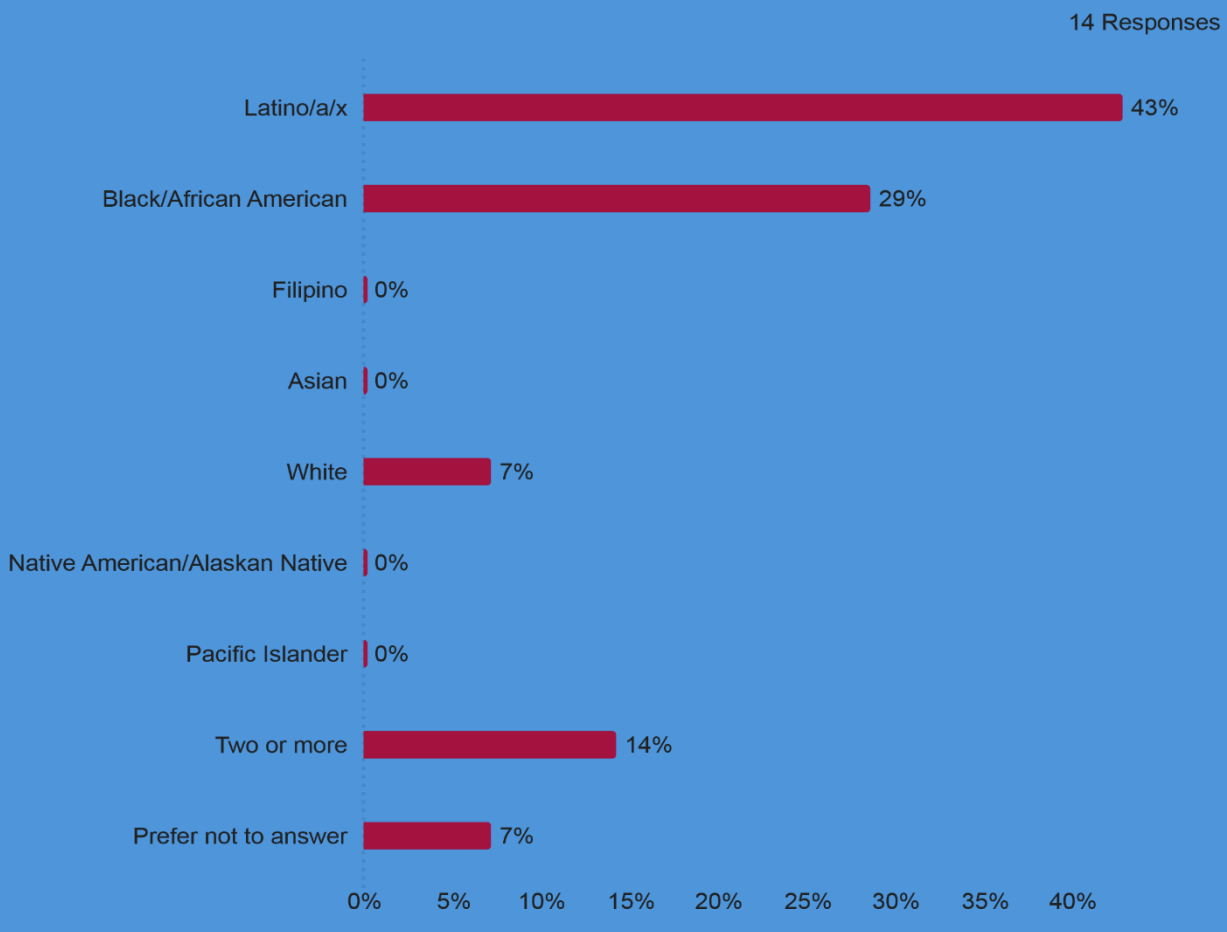


Have you thought about what you want to do for your career?

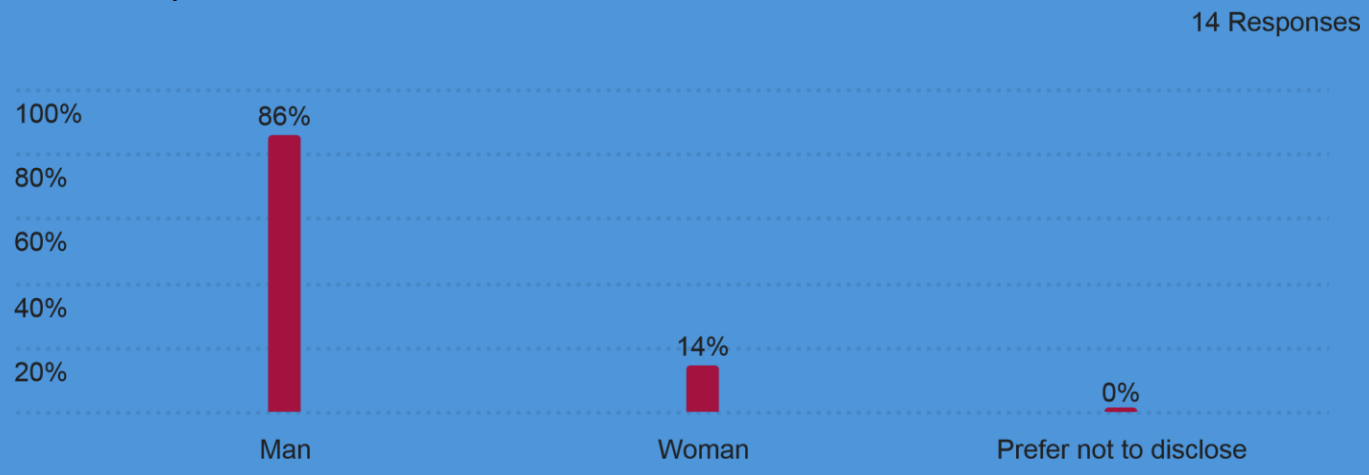


Demographics

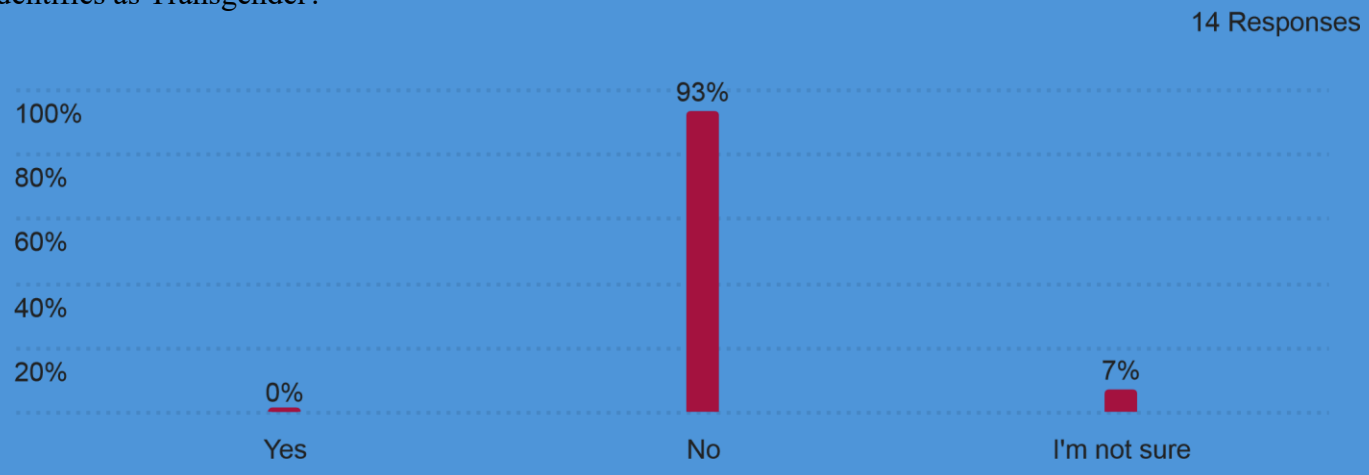
Race/Ethnicity



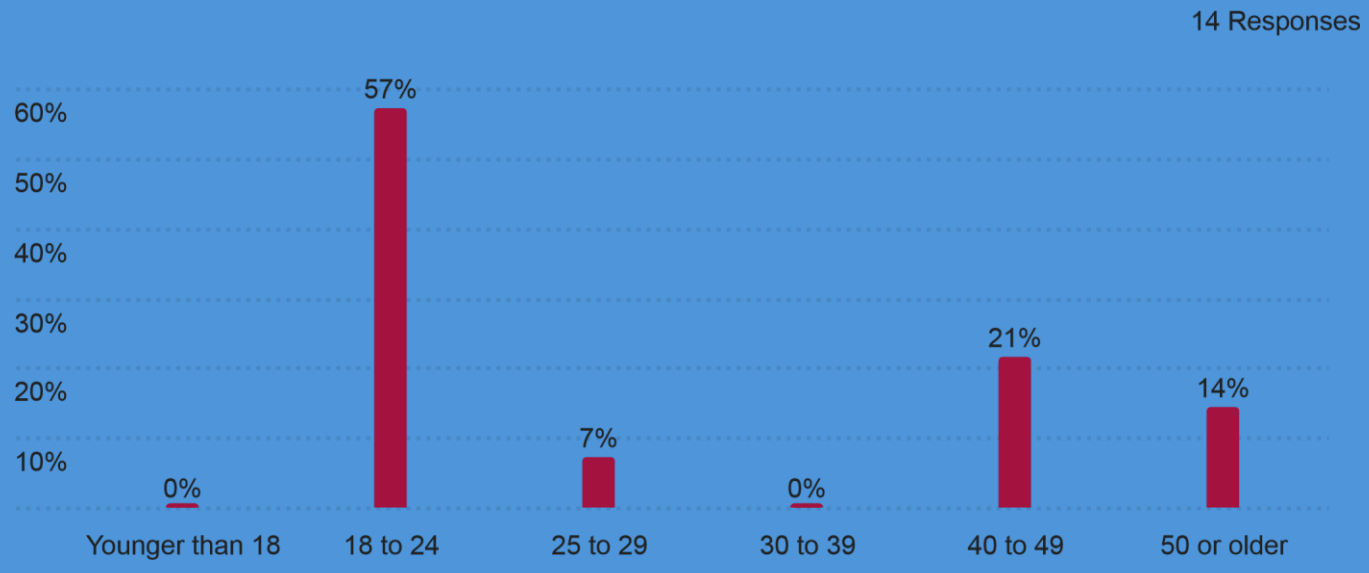
Gender Identity



Identifies as Transgender?



Age Group



H) Facilities & Equipment:

- **Description and Assessment of Existing Facilities and Equipment**

  The HVACR program continues to serve students and provide foundational technical training; however, the program is currently operating with significant limitations in facilities, instructional space, safety infrastructure, and equipment. Many of the existing resources are aging and no longer adequately reflect the technologies, equipment, and working conditions students are likely to encounter in the modern HVACR industry. These limitations have a direct impact on the program's ability to provide comprehensive hands-on instruction, maintain appropriate safety practices, and support future enrollment and program growth.

  One of the most immediate concerns is the lack of adequate ventilation infrastructure to support brazing instruction. Brazing is an essential skill within HVACR installation and service, and students need supervised opportunities to develop proficiency in this area. At present, the laboratory does not have the ventilation capacity necessary to conduct brazing activities appropriately. As a result, brazing instruction has been suspended. This creates a significant gap in the hands-on curriculum and limits students' ability to develop and demonstrate a skill that is relevant to entry-level employment and industry practice. Addressing the ventilation deficiency would allow the program to restore this component of instruction while providing a safer and more appropriate learning environment.

  The program also has limited access to installation-based and interactive training applications. Students need opportunities to move beyond individual components and classroom demonstrations and engage in complete installation, wiring, commissioning, diagnostic, and troubleshooting activities. Current facilities provide limited opportunities to construct and troubleshoot full systems that replicate conditions encountered in residential and commercial field environments. Additional training stations, installation mock-ups, and dedicated troubleshooting applications would significantly strengthen students' ability to connect theoretical concepts with practical field applications.

  Another concern is the age and technological relevance of much of the existing instructional equipment. While the current equipment remains useful for teaching fundamental HVACR principles, much of it does not adequately represent the equipment and technologies increasingly used in the industry. Students have limited exposure to newer systems and components, including inverter-driven compressors, modern refrigeration equipment, A2L refrigerant systems, electronic controls, variable-speed technologies, and building automation systems. As HVACR technology continues to evolve, access to current equipment is increasingly important for preparing students to enter the workforce with relevant technical skills.

  The limited availability of modern equipment also affects the program's ability to provide meaningful troubleshooting experiences. Contemporary HVACR technicians are increasingly expected to diagnose electrical, mechanical, refrigeration, and control-system issues using electronic instruments and digital diagnostic methods. Expanding the program's inventory of current training equipment, controls, diagnostic tools, and system simulators would provide students with more opportunities to develop these competencies in a controlled instructional environment before entering the workforce.

Space limitations further compound these challenges. The existing laboratory environment restricts the number and variety of instructional activities that can be conducted simultaneously and makes it difficult to accommodate additional equipment or create dedicated installation and troubleshooting stations. Limited space also affects the program's ability to efficiently organize equipment, provide adequate student work areas, and establish clearly defined instructional and safety zones. Improvements to the physical learning environment would therefore benefit not only equipment capacity but also instructional organization, student participation, and overall laboratory safety.

Despite these challenges, faculty have demonstrated a strong commitment to maintaining program operations and supporting student success. Instructors have adapted their teaching methods, shared available equipment, modified laboratory activities, and incorporated alternative instructional strategies to provide students with meaningful learning experiences within the existing constraints. These efforts have allowed the program to remain operational and continue developing foundational student competencies, particularly as the program works to rebuild enrollment and establish sustainable growth following its restart.

However, reliance on these instructional adaptations should be viewed as a temporary strategy rather than a long-term solution. Continued dependence on aging equipment, limited laboratory space, and unavailable safety infrastructure restricts the program's capacity to expand its curriculum and respond effectively to changing industry requirements. It also creates challenges in providing students with consistent access to hands-on experiences across the full range of competencies identified in the program's curriculum.

Modernizing the HVACR facilities and equipment would provide substantial benefits to students, faculty, and the surrounding workforce. Priority improvements should include appropriate ventilation for brazing and related laboratory activities; updated HVACR training equipment; dedicated installation and troubleshooting stations; modern electrical and electronic controls; A2L-compatible training systems; inverter-driven and variable-speed equipment; refrigeration training units; current diagnostic tools; and exposure to building automation and other emerging technologies. Where feasible, partnerships with industry advisory members, employers, equipment manufacturers, and other community stakeholders could also help identify current workforce needs and support the acquisition of relevant equipment.

Investment in these areas would improve the program's ability to provide safe, hands-on instruction while strengthening alignment between classroom training and current industry practices. It would also create a more attractive and contemporary learning environment that could support student recruitment, retention, completion, and employment outcomes. Access to modern equipment and realistic installation and troubleshooting scenarios would better prepare students to transition from the classroom into entry-level HVACR positions and continue developing their skills throughout their careers.

Overall, the HVACR program remains viable and continues to provide valuable educational opportunities through the commitment of its faculty and the engagement of its students. However, the current condition of the facilities and instructional equipment represents a significant barrier to program development and long-term sustainability. Addressing the identified infrastructure, safety, space, and equipment needs should be considered a priority for continued program improvement. Strategic investment in the laboratory environment will be essential to restoring

suspended training activities, expanding hands-on learning opportunities, strengthening workforce preparation, supporting enrollment growth, and ensuring that the HVACR program can continue to meet the evolving needs of students, employers, and the industry.

- **Priority (1–2 Year) Facilities and Equipment Needs**

The HVACR program has several critical facilities and equipment needs that should be addressed within the next one to two years to ensure safe and effective instruction, maintain program viability, and provide students with training that reflects current industry practices. These needs directly influence the quality of hands-on instruction, student skill development, course delivery, workforce preparation, and the program's capacity to support future enrollment growth. Strategic investment in these areas will be necessary to modernize the instructional environment and ensure that students graduate with the technical competencies expected by today's HVACR employers.

1. **Laboratory Ventilation System — Highest Priority**

The most immediate facility need is the installation of an appropriate ventilation and exhaust system to support brazing and other refrigerant-related laboratory activities. The current laboratory does not have adequate ventilation infrastructure to safely conduct brazing instruction, resulting in the suspension of this important hands-on component of the curriculum. Brazing is a fundamental HVACR skill used in refrigerant piping, system installation, repair, and maintenance, and students need direct supervised practice to develop proficiency.

Installation of a dedicated laboratory ventilation system with appropriate exhaust, make-up air, electrical requirements, and applicable safety features would allow the program to restore brazing instruction and provide students with practical experience in refrigerant piping, joint fabrication, system installation, and repair procedures. The estimated cost for a compliant ventilation system is approximately **$20,000–$40,000**, depending on required ductwork, electrical modifications, structural changes, and installation requirements.

Failure to address this need would continue to limit hands-on instruction and leave students with insufficient experience in an important industry skill. Restoring this capability should therefore be considered the program's highest facilities priority.

2. **Modern HVACR Training Equipment**

A second critical priority is the replacement and expansion of aging instructional equipment with modern HVACR training systems that reflect current industry technology. Existing equipment remains useful for teaching fundamental concepts, but it provides limited exposure to technologies that are increasingly common in residential, commercial, and industrial applications.

Priority equipment should include **A2L-compatible refrigeration and air-conditioning trainers, inverter-driven systems, advanced electrical and electronic control boards, variable-speed equipment, and interactive diagnostic training stations**. These systems would allow students to practice installation, system configuration, electrical diagnostics,

troubleshooting, controls, and service procedures using equipment that more closely resembles what they will encounter in the workplace.

A phased equipment modernization plan is estimated at approximately **$30,000–$60,000**, depending on the number of training stations, equipment specifications, and system complexity. A phased approach would allow the program to prioritize the most instructionally significant equipment while continuing to expand its inventory as resources become available.

Without modernization, students will continue to have limited exposure to current HVACR technologies, potentially creating a gap between classroom training and employer expectations. Updating the equipment inventory would strengthen workforce preparation and improve the program's ability to respond to technological changes within the industry.

3. **Digital Simulation and Virtual Training**

Because existing laboratory space limits the number of physical training stations that can be installed, the program should also consider implementing a digital learning and simulation platform, such as the **Interplay Learning LMS and VR training system**. A simulation-based training environment would complement, rather than replace, hands-on laboratory instruction by providing students with additional opportunities to practice installation, diagnostics, troubleshooting, and service procedures.

Digital simulations can expose students to a broader range of HVACR scenarios than can reasonably be accommodated within the current physical laboratory. Students could work through guided diagnostic exercises, virtual equipment configurations, troubleshooting scenarios, and other structured learning activities in a controlled environment. This approach would also provide opportunities for students to reinforce concepts outside of scheduled laboratory hours.

Institutional licensing for an LMS and VR training platform of this type is estimated at approximately **$10,000–$15,000 annually**, depending on the number of student licenses and features included. Implementation would provide the program with a cost-effective method of expanding instructional capacity while longer-term facility improvements are being pursued.

4. **Laboratory Organization, Storage, and Functionality**

The program also needs improvements to laboratory organization, equipment storage, and overall instructional functionality. Installing structured storage systems, mobile tool carts, dedicated equipment areas, and clearly designated training stations would improve the organization and efficiency of the laboratory.

These improvements would allow students to access tools and equipment more efficiently, reduce setup and breakdown time, improve laboratory workflow, and create a more organized instructional environment. Clearly defined work areas would also support safer laboratory operations and make it easier for faculty to manage multiple instructional activities simultaneously.

The estimated cost for these improvements is approximately **$5,000–$10,000**, depending on the type and quantity of storage systems, carts, workstations, and related materials required.

5. **Recommended Implementation Timeline**

Given the significance of these needs, the program recommends a phased implementation strategy over the next one to two years:

Priority	Need	Estimated Cost	Recommended Timeline
1	Laboratory ventilation and exhaust system	$20,000–$40,000	Year 1
2	Modern HVACR training equipment	$30,000–$60,000	Years 1–2
3	Digital LMS/VR simulation platform	$10,000–$15,000 annually	Year 1
4	Storage, mobile carts, and lab organization	$5,000–$10,000	Year 1–2

The estimated initial investment for these priorities is approximately **$65,000–$125,000**, excluding recurring annual licensing costs and any additional construction or infrastructure requirements that may be identified during detailed facilities assessment.

- **Overall Impact**

Collectively, these improvements are essential to maintaining a safe, relevant, and sustainable HVACR instructional program. The ventilation system would restore critical hands-on brazing activities; modern equipment would bring classroom training closer to current industry practices; digital simulation would expand learning opportunities despite existing space limitations; and improved laboratory organization would increase instructional efficiency and safety.

If these needs remain unaddressed, the program will continue to face limitations in laboratory capacity, hands-on skill development, equipment relevance, and workforce preparation. Over time, these constraints could affect student recruitment and retention, enrollment growth, and the program's ability to remain aligned with rapidly changing industry expectations.

Addressing these priorities will allow the HVACR program to strengthen its hands-on curriculum, improve student access to current technologies, restore essential laboratory activities, and provide a more comprehensive pathway to employment. These investments will also establish a stronger foundation for long-term program growth and ensure that the program remains responsive to the evolving needs of the HVACR industry and the regional workforce.

- **Long-Term (2–4+ Year) Facilities and Equipment Needs**

Beyond the immediate operational and instructional needs, the HVACR program will require substantial long-term investment in facilities, equipment, and specialized training capabilities to support sustainable growth and respond effectively to evolving workforce demands. Over the next two to four years, the program should pursue a long-range development strategy focused on expanding instructional capacity, modernizing laboratory infrastructure, and creating a comprehensive training environment that reflects the full scope of the contemporary HVACR industry.

The most significant long-term priority is the development or renovation of an expanded laboratory space or dedicated HVACR training facility. The current instructional environment does not provide sufficient space to accommodate the variety of equipment and hands-on activities necessary for a comprehensive HVACR program. A dedicated facility would allow the program to establish multiple instructional zones and provide students with opportunities to work with complete systems rather than relying primarily on individual instructional units.

A modern HVACR training facility should be designed to support the major sectors of the industry, including **residential, commercial, and industrial heating, air conditioning, ventilation, and refrigeration**. Ideally, the facility would incorporate dedicated areas for installation and commissioning, system diagnostics and troubleshooting, refrigeration, airflow and ventilation, electrical applications and controls, combustion systems, brazing, and emerging HVAC technologies. Creating separate but interconnected instructional zones would allow faculty to conduct multiple laboratory activities simultaneously while providing students with a learning environment that more closely resembles professional field conditions.

The development or renovation of a dedicated HVACR training facility is estimated to require approximately **$500,000–$1.2 million**, depending on the size and scope of the project, construction requirements, utilities, ventilation, electrical infrastructure, equipment needs, and other facility improvements. Because of the scale of this investment, the project should be approached as a phased, long-term institutional initiative that can be aligned with capital planning, workforce development opportunities, industry partnerships, and potential external funding sources.

- **Expansion into Emerging and Specialized Technologies**

  In addition to expanding the core laboratory, the program should gradually develop specialized training areas that reflect emerging technologies and areas of growing workforce demand. HVACR systems are becoming increasingly integrated with energy efficiency, digital controls, automation, indoor environmental quality, and specialized cooling applications. Preparing students for these developments will help ensure that the program remains relevant as the industry continues to evolve.

  One potential area of expansion is **Indoor Air Quality (IAQ)** and air-quality specialist training. Increased attention to ventilation, filtration, air purification, building health, and indoor environmental conditions has created additional opportunities for HVACR technicians with specialized knowledge in these areas. Dedicated IAQ training equipment and instructional modules could provide students with additional competencies that complement traditional HVACR installation and service skills.

  Another important area is **advanced building automation and controls**. Modern commercial buildings increasingly rely on sophisticated control systems to monitor and manage heating, cooling, ventilation, energy consumption, and building performance. Expanding training in digital controls, building automation systems, sensors, programmable controllers, and system integration would provide students with skills applicable to a broader range of commercial and industrial employment opportunities.

The program should also consider developing training capabilities related to **data center cooling and precision climate control**. The continued expansion of data centers and technology infrastructure has increased the importance of reliable, high-efficiency cooling systems and technicians capable of maintaining tightly controlled environmental conditions. Introducing students to precision cooling, redundancy concepts, advanced refrigeration technologies, and high-efficiency system operation would provide exposure to a specialized area of the industry with significant potential for future employment opportunities.

Development of these specialized training areas, including equipment, instructional infrastructure, and related curriculum resources, is estimated at approximately **$150,000–$300,000** as a phased investment. The program can prioritize these areas based on industry demand, available funding, employer partnerships, and the availability of qualified faculty.

- **Industry Partnerships and Workforce Development**

  A long-term modernization strategy should also include stronger partnerships with HVACR employers, manufacturers, contractors, industry organizations, and other workforce stakeholders. Industry partnerships can provide valuable guidance regarding emerging technologies and employer expectations while creating opportunities for equipment donations, demonstrations, internships, work-based learning, guest instruction, and employment pipelines.

  These partnerships would also strengthen the program's ability to keep its curriculum and equipment aligned with current industry practices. As technologies change more rapidly, continued communication with industry professionals will be essential to identifying which systems, tools, and skills should be incorporated into future training.

- **Long-Term Program Vision**

  The long-term objective is to establish the HVACR program as a **comprehensive regional training center** capable of preparing students for a broad range of careers across the HVACR industry. Students should be able to progress from foundational concepts and entry-level technical skills into increasingly advanced applications without having to leave the program to access specialized training.

  A fully developed program would incorporate modern refrigeration technologies, high-efficiency HVAC systems, A2L refrigerant applications, electrical and electronic controls, building automation, indoor air quality, advanced diagnostics, airflow and ventilation systems, and specialized cooling applications. This expanded instructional environment would provide students with exposure to the equipment and technologies they are most likely to encounter throughout their careers.

  A modernized facility would also create opportunities for the college to offer continuing education, industry certification preparation, incumbent-worker training, customized employer training, and other workforce development activities. These additional functions could strengthen relationships with regional employers and increase the program's value to the surrounding community.

- **Expected Institutional and Student Benefits**

  Investment in long-range facilities and equipment would provide benefits extending beyond individual courses. Expanded laboratory capacity would create opportunities to increase enrollment, add instructional sections, introduce advanced coursework, and accommodate a broader range of hands-on activities. A modern facility could also improve student recruitment by providing prospective students with a visible, contemporary training environment that demonstrates a clear connection between education and employment.

  Failure to address these long-term needs would continue to constrain the program's ability to expand enrollment, introduce specialized technologies, and provide comprehensive workforce preparation. Students could have limited exposure to advanced systems that are becoming increasingly common across the HVACR industry, potentially reducing their competitiveness for specialized employment opportunities.

  Conversely, strategic investment in expanded facilities and advanced equipment would position the HVACR program for sustainable growth and modernization. It would strengthen the program's alignment with regional workforce needs, create opportunities for deeper industry collaboration, and provide students with a broader and more relevant technical education.

  Ultimately, the long-term goal is to develop an HVACR training environment that is **safe, modern, industry-responsive, and capable of supporting students from foundational training through advanced technical applications**. Achieving this vision will require sustained institutional commitment and phased investment, but it would provide a strong foundation for the program to become a premier HVACR workforce training pathway and a valuable resource for employers and the broader community.

- **Related Facilities and Equipment Recommendations**

  To support the continued development, effectiveness, and long-term sustainability of the Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) program, this review identifies several interconnected facilities and equipment recommendations. These recommendations build upon the immediate and long-term priorities discussed above and provide a practical framework for strengthening laboratory safety, increasing instructional capacity, modernizing training resources, and ensuring that students are prepared to work with the broad range of HVACR technologies found in today's workforce.

- **Establish a Phased Facilities Improvement Plan**

  The program should develop and implement a phased facilities improvement plan that prioritizes safety, functionality, and instructional capacity. The first phase should address critical safety infrastructure, particularly the installation of appropriate ventilation and exhaust systems for brazing and combustion-related activities. These improvements should be followed by enhancements to laboratory work areas, equipment storage, electrical infrastructure, and overall laboratory organization.

  Prioritizing safety-related infrastructure will allow the program to restore currently limited or suspended laboratory activities while establishing the foundation necessary for future equipment

additions. Short-term infrastructure improvements are estimated at approximately **$20,000–$40,000**, depending on the scope of work, facility configuration, ventilation requirements, and related electrical or structural modifications.

- **Modernize Instructional Equipment in Phases**

  The program should establish a systematic equipment replacement and modernization schedule that prioritizes technologies most relevant to current HVACR employment. Existing equipment should be evaluated based on age, instructional value, condition, safety, and alignment with current industry practices.

  Initial modernization efforts should focus on updated refrigeration trainers, modern heating and air-conditioning equipment, ventilation and airflow systems, electrical and electronic controls, advanced diagnostic instruments, and other hands-on instructional units. Equipment should represent residential, commercial, and industrial applications whenever feasible.

  A phased purchasing strategy will allow the program to make meaningful improvements without requiring the entire equipment inventory to be replaced simultaneously. Initial modernization is estimated at approximately **$40,000–$75,000**, with additional investment in advanced systems as facility improvements progress. Equipment purchases should be informed by faculty input, Advisory Committee recommendations, employer needs, and emerging industry technologies.

- **Expand Digital and Simulation-Based Instruction**

  The continued integration of digital instructional technologies should be incorporated into the program's overall modernization strategy. Simulation-based learning platforms and virtual training environments can provide valuable supplemental experiences when physical laboratory space or equipment is limited.

  Digital tools can allow students to practice diagnostic procedures, system troubleshooting, equipment configuration, installation concepts, and service scenarios that may not yet be available in the physical laboratory. These resources should complement hands-on instruction rather than replace it, providing students with additional opportunities to reinforce technical concepts and develop diagnostic reasoning.

  Annual licensing and implementation costs for appropriate digital learning and simulation resources are estimated at approximately **$10,000–$18,000**, depending on platform capabilities, student enrollment, and licensing requirements. Incorporating these technologies would help bridge the gap between current laboratory capacity and the program's long-term instructional goals.

- **Develop a Comprehensive Equipment Replacement and Maintenance Plan**

  In addition to acquiring new equipment, the program should establish a structured process for monitoring, maintaining, repairing, and eventually replacing existing instructional resources. A formal equipment inventory could identify the age, condition, instructional purpose, maintenance requirements, and replacement priority of each major piece of equipment.

This approach would allow the program to anticipate future needs rather than relying primarily on reactive replacement. Establishing annual equipment reviews and a multi-year replacement schedule would also provide stronger documentation for institutional budget requests and future capital planning.

- **Strengthen Industry and Advisory Committee Involvement**

  Future facilities and equipment decisions should continue to be informed by industry professionals and the program's Advisory Committee. Regular industry input can help identify emerging technologies, changing employer expectations, and equipment that graduates are most likely to encounter in the workplace.

  Industry partnerships may also provide opportunities for equipment donations, discounted purchases, demonstrations, guest instruction, internships, work-based learning, and other forms of workforce collaboration. These relationships can help ensure that investments in facilities and equipment remain closely connected to regional employment needs.

- **Establish a Long-Term HVACR Training Center Vision**

  The program should develop a long-term facilities vision that moves toward a comprehensive HVACR training center capable of supporting residential, commercial, and industrial instruction. The future facility should provide dedicated areas for installation, refrigeration, heating, air conditioning, ventilation, electrical applications, controls, diagnostics, brazing, and other specialized training activities.

  As resources permit, the facility should also incorporate emerging areas such as **indoor air quality, energy-efficient HVAC technologies, advanced building automation and controls, A2L refrigerant applications, and specialized cooling systems**. Establishing this vision now will provide a framework for future capital planning and help ensure that individual facility and equipment investments contribute toward a coherent long-term goal.

Recommended Implementation Framework

Priority	Recommendation	Estimated Investment	Timeframe
1	Safety infrastructure and ventilation improvements	$20,000–$40,000	Immediate/Year 1
2	Initial equipment modernization	$40,000–$75,000	Years 1–2
3	Digital simulation and virtual training	$10,000–$18,000 annually	Year 1 and ongoing
4	Equipment maintenance and replacement planning	To be determined annually	Ongoing
5	Industry partnership and equipment support	Variable	Ongoing
6	Comprehensive HVACR training center	Long-term capital investment	Years 2–4+

Conclusion

Taken together, these recommendations provide a structured roadmap for strengthening the HVACR program's facilities and instructional resources. The immediate focus should remain on

safety infrastructure and the restoration of essential hands-on activities, followed by systematic modernization of equipment and expansion of digital learning resources. At the same time, the program should maintain a long-term vision for a comprehensive HVACR training center that reflects the changing needs of the industry.

Strategic and phased investment will allow the program to make measurable improvements while building toward a larger modernization effort. These investments will enhance student safety, increase hands-on learning opportunities, improve exposure to current HVACR technologies, strengthen workforce preparation, and create the infrastructure necessary to support future enrollment and program growth.

Ultimately, the goal is to develop an instructional environment that is **safe, technologically current, industry-informed, and capable of preparing students for the full range of opportunities within the evolving HVACR workforce**.

I) Status of Previous Recommendations & Program Data Analysis

The 2021 HVACR Program Review produced three primary recommendations: expansion of laboratory instructional space, hiring of additional part-time instructional staff, and establishment of a full-time Tool Room Attendant position. As of this review cycle, none of these recommendations have been implemented.

The HVACR program has not been operational since 2021. The same structural barriers identified in the previous review — inadequate lab space, insufficient staffing, and lack of tool room support — remain the primary obstacles to program resumption and growth. These unresolved recommendations now serve as the program's highest-priority action items for the current review cycle.

Laboratory Space. The most critical unmet recommendation is the need for improved, expanded HVACR laboratory space. Current instructional space is significantly undersized, restricting class capacity, preventing safe equipment operation, and making it impossible to conduct the hands-on laboratory instruction that HVACR training requires. Resolving the lab space deficiency is a prerequisite for any meaningful program expansion and must be treated as the program's top capital priority.

Instructional Staffing. No additional part-time HVACR instructor has been hired since the 2021 review. The program currently cannot sustain safe, industry-compliant student-to-instructor ratios across lecture and laboratory sessions with its existing staffing level. A minimum of one additional part-time instructor is required before course offerings can be safely expanded.

Tool Room Attendant. The 2021 review identified the need for a full-time Tool Room Attendant, a position that remains unfilled. Without dedicated tool room support, instructors are diverted from teaching responsibilities to manage equipment, maintain lab readiness, and ensure safety compliance. A full-time attendant would directly improve lab operations, student safety, and the quality of hands-on instruction.

- **Priority Actions for the Current Review Cycle:**
    - Identify and secure adequate, dedicated HVACR laboratory space
    - Hire at least one additional part-time HVACR instructor

- Establish a full-time Tool Room Attendant position
- Reactivate and expand course offerings as space and staffing needs are met

Until these foundational needs are addressed, the program's capacity to serve students, generate FTES, and produce workforce-ready completers will remain constrained.

1. **Enrollment Trends and Demographic Analysis**

   Enrollment Trends

   Enrollment in the HVACR program declined sharply during the review cycle, driven directly by program inactivity following 2021. Spring 2020 enrollment stood at 50 students. By Fall 2020, that number had dropped to 18, and by Spring 2023, enrollment had fallen to 11 — a consequence of suspended course offerings, inadequate lab access, and staffing constraints rather than declining student interest.

   Since the program resumed in the 2024–25 academic year, enrollment has rebounded to 32 students in Fall 2025. This recovery, while modest, signals genuine student demand. Growth beyond current levels, however, remains limited by tight lab space, conservative section caps, and the absence of additional instructional staffing.

   Race and Ethnicity

   The program serves a predominantly underrepresented student population. In 2024–25, Latino students represent 43% of enrollment, Black/African American students 29%, students of two or more races 14%, and White students 7%, with 7% preferring not to disclose. This demographic profile is consistent with prior enrollment periods and reflects the program's role as an equity-centered workforce pathway serving students from historically underrepresented communities.

   Age Distribution

   The program serves both traditional-age and adult learner populations. In 2024–25, 57% of students are between the ages of 18 and 24, while 21% are between 40 and 49, 14% are 50 or older, and 7% are between 25 and 29. This age spread reinforces the program's dual function: preparing younger students for initial workforce entry while supporting older students in career advancement and retraining — both central to the program's career technical education mission.

   Gender

   The program remains predominantly male, with 86% of enrolled students identifying as men and 14% as women in 2024–25. While female participation is limited, it represents an opportunity for targeted outreach and recruitment. The program recognizes the importance of actively promoting gender diversity in the skilled trades and will explore strategies to attract and support women entering the HVACR field.

Educational Goals

Student educational goals reflect strong workforce intent. In 2024–25, 64% of students reported knowing exactly what career they want to pursue, while 36% indicated they have a general direction but have not fully decided. No students reported being uncertain about pursuing a career. This data confirms that the student population is career-focused and aligned with the program's workforce preparation mission.

2. **Course Grade Distribution**

Grade distributions in the HVACR program during the review cycle reflect the program's structural context — small cohorts, limited course offerings, and recent resumption after an extended period of inactivity — rather than long-term instructional trends. Patterns that have emerged, however, offer useful direction for program planning.

Courses with consistent, structured laboratory access tend to produce stronger student performance. When students can engage directly with equipment, practice technical skills repeatedly, and apply concepts in real-world scenarios, grade distributions skew toward higher success outcomes. This pattern is consistent with research on experiential learning in career technical education and supports the program's emphasis on hands-on instruction as the primary pedagogical approach.

In contrast, courses with higher theoretical and conceptual demands — particularly those covering electrical principles, refrigerant controls, and system diagnostics — show greater variability in grade distribution. Students earning lower passing grades in these courses often do so not due to lack of effort or motivation, but because limited lab time reduces their ability to reinforce and apply complex concepts through practice.

Structural constraints — specifically limited lab space, restricted equipment access, and the absence of tool room support — contribute to these grade patterns by reducing the frequency and quality of hands-on learning opportunities. Addressing these barriers is therefore likely to improve grade consistency across courses by enabling more repetition, individualized instruction, and applied reinforcement.

As the program stabilizes and cohort sizes increase, grade distribution data will become more analytically meaningful. The program is committed to ongoing assessment of course-level outcomes to identify areas requiring instructional adjustment, additional support, or resource investment.

3. **Student Success Rates and Equity Analysis**

Success rates in the HVACR program must be interpreted within the context of small cohort sizes and the program's recent return to operation. With limited enrollment data available, trends should be understood as preliminary indicators rather than statistically definitive findings.

The program serves a high proportion of students from disproportionately impacted populations — primarily Latino and Black/African American students, who together represent the majority of enrollment. Preliminary outcome data from the 2024–25 academic year do not reveal consistent, systemic success gaps between demographic groups. However, variability in performance does

appear in courses with higher conceptual demand, where differences in prior academic preparation and reduced access to hands-on practice can compound difficulty.

Instructional observation and student feedback consistently indicate that when students from disproportionately impacted backgrounds have sufficient access to laboratory time, direct instructor guidance, and applied learning opportunities, success rates improve markedly. Conversely, structural constraints — limited lab space, reduced equipment availability, and constrained instructional support — disproportionately affect students who benefit most from experiential learning and individualized practice.

Current Equity-Focused Strategies:

- Intentional scaffolding of complex technical concepts to build comprehension incrementally
- Consistent connection of theory to real-world application to support engagement and retention of material
- Frequent formative assessment to identify and address learning gaps before they compound
- Active promotion of academic support services and early intervention for at-risk students
- Cultivation of a strong classroom community, which students consistently identify as a program strength

Planned Improvements: The program recognizes that structural equity — expanded lab space, additional instructional staffing, and dedicated tool room support — is as important as instructional equity. These improvements would reduce student-to-instructor ratios, increase hands-on practice time, and create conditions in which all students, particularly those from disproportionately impacted groups, can consistently achieve course learning outcomes. As cohort sizes grow, the program will continue to monitor disaggregated success data to identify trends and refine equity interventions accordingly.

4. **Retention Rates and Equity Analysis**

Retention rates during the review cycle have been shaped primarily by the program's period of inactivity and the constrained capacity under which it resumed in 2024–25. In this context, student withdrawals are more closely associated with structural and external factors than with academic performance.

Students who do withdraw most commonly cite work obligations, scheduling conflicts, health-related issues, and limited access to laboratory time as contributing factors. These challenges disproportionately affect students from equity populations, who often have fewer flexible resources, greater competing responsibilities, and less financial cushion to absorb scheduling disruptions. At this time, however, there is no clear evidence of consistent retention disparities across demographic groups — a finding that will need to be revisited as cohort sizes grow.

Delivery Method and Retention

Retention data and instructional experience consistently support face-to-face, lab-based instruction as the delivery method most effective for retaining HVACR students. Courses that provide regular, structured laboratory access retain students at higher rates. Where retention challenges occur, they are more likely to emerge in course components with reduced hands-on time or heavier reliance on

theory-based instruction, reinforcing that student persistence in this program is closely tied to learning modality.

Distance education elements have been incorporated where appropriate but are most effective when paired with robust in-person laboratory experiences. Online-only or theory-heavy delivery without a lab counterpart presents meaningful retention risks for a student population that learns and persists best through applied, physical engagement with technical material.

Retention-Focused Strategies:

- Early engagement and transparent communication of course expectations at the outset of each term
- Frequent formative assessments aligned with student learning outcomes (SLOs) to monitor progress and flag concerns early
- SLO data confirm that students who remain enrolled are generally achieving core learning outcomes, suggesting that withdrawals are access- and support-related rather than reflective of inability to meet program standards
- A supportive, community-centered learning environment that students consistently identify as a reason for continuing

Planned Improvements: Expanded laboratory space, additional instructional staffing, and full-time tool room support are the structural investments most likely to improve retention — particularly for disproportionately impacted students. These improvements would increase lab access, reduce instructional bottlenecks, and allow more individualized attention during hands-on sessions. As enrollment stabilizes, retention data will be disaggregated and monitored closely to identify emerging gaps and refine targeted interventions.

5. Success and Retention by Delivery Method

Face-to-face instruction consistently produces stronger success and retention outcomes than distance education components in the HVACR program. This is unsurprising given the technical nature of HVACR work: mastery of skills related to electrical systems, refrigerant controls, mechanical troubleshooting, and system installation requires direct physical engagement with equipment, real-time instructor correction, and repeated hands-on practice — none of which can be replicated fully in a distance format.

In face-to-face courses with regular laboratory access, students benefit from immediate feedback, structured repetition, and the kind of applied problem-solving that builds both technical competence and professional confidence. These elements are consistently associated with higher course completion, stronger grade outcomes, and greater persistence through the program sequence.

Distance education components, where used, have served a supplementary function — supporting review of technical concepts, flexible access to course materials, and continuity during periods of disrupted lab access. However, when distance delivery becomes the primary modality for instruction that should be hands-on, both success and retention rates are negatively affected. Students who depend on structured learning environments, direct instructor interaction, and physical practice to achieve mastery are most adversely impacted by reduced in-person access.

Going forward, the program will prioritize face-to-face, lab-based delivery for all core technical coursework while using distance education components strategically to supplement — not replace — in-person instruction. Scheduling and delivery decisions will continue to be guided by student learning needs, SLO performance data, and industry expectations for workforce preparation.

6. **Enrollment Statistics: Section Counts, Seat Availability, and Fill Rates**

Since resuming in 2024–25, the HVACR program has deliberately maintained low section counts and conservative enrollment caps. This enrollment management approach is not a reflection of reduced demand but rather a necessary response to safety requirements, limited laboratory space, and the restricted number of instructors available to supervise hands-on lab activities.

Fill rates for currently offered sections are generally stable and at or near established capacity. This pattern reflects suppressed supply rather than suppressed demand — students are interested in enrolling, but the program cannot safely expand section sizes or add new sections under current conditions.

Core required courses tend to fill most quickly, consistent with their role as entry points into the program sequence. Advanced or less frequently offered courses show lower enrollment figures primarily because they are offered infrequently and students must complete prerequisites before they are eligible. Limited scheduling flexibility also affects student timing, as courses offered only once per academic year create structural barriers to progression independent of student motivation.

Overall, fill rate trends confirm that the program is operating at the ceiling of its current capacity. Expanding section counts, increasing seat availability, and meeting documented student demand will require direct investment in laboratory space, instructional staffing, and tool room infrastructure. Without these investments, the program cannot grow in alignment with the student interest that current fill rates clearly reflect.

7. **Course Scheduling: Days, Times, Frequency, and Sequencing**

HVACR courses are currently offered primarily during evening hours, a scheduling decision that reflects the needs of the program's student population — many of whom are employed full-time during the day or have daytime caregiving and family obligations. Student feedback consistently indicates that evening scheduling is appropriate and accessible, and it remains the right primary scheduling approach given the demographic profile of enrolled students.

However, the frequency of course offerings falls short of meeting student demand. With only a limited number of sections available each term due to space and staffing constraints, students often face delays in completing required courses in the intended sequence. When prerequisite courses are offered only once per academic year, scheduling gaps can add one or more semesters to a student's time to completion — a significant equity and retention concern for students who are balancing work, family, and educational obligations simultaneously.

Course sequencing is logically structured to progress students from foundational principles to advanced technical applications. In practice, however, the limited availability of sections disrupts this progression. Students who miss a course offering may wait a full academic year before the next

opportunity, fragmenting their learning experience and increasing the risk of withdrawal or program abandonment.

Addressing scheduling limitations will require the same structural investments identified throughout this review: additional laboratory space to allow multiple concurrent sections, increased instructional staffing to support expanded scheduling, and tool room support to maintain lab readiness across a greater number of instructional days. With these resources in place, the program could add daytime section offerings, increase section frequency for high-demand courses, and provide students with a scheduling environment that supports consistent, timely progression through the program.

8. Completion Counts and Transfer Data

Degree and certificate completion rates during the review cycle directly reflect the program's extended period of inactivity. With courses suspended after 2021 and students unable to progress through the full program sequence, the Program Awards Dashboard and Chancellor's Office DataMart confirm that few or no awards were conferred during the inactive years. This outcome is a predictable consequence of program suspension rather than an indicator of student capability or program quality.

Since the program resumed in 2024–25, students are currently in the early to mid-stages of their coursework. The full program sequence has not yet been completed by students enrolled under the new cohort, meaning completion counts for this cycle remain minimal but are expected to grow meaningfully as students advance.

Transfer rates for the HVACR program remain low and are consistent with the program's design as a career technical education workforce pathway. The primary goal for the vast majority of enrolled students is to gain industry-recognized skills, earn a certificate or associate degree, and enter or advance in the HVACR workforce — not to transfer to a four-year institution. This mission alignment makes low transfer rates an expected and appropriate outcome rather than a performance concern.

Projected Completions (Based on Current Enrollment and Trajectory):

- 5 to 10 certificate completions annually within the next one to two academic years
- 2 to 4 associate degree completions annually as students complete both core program and general education requirements

These projections assume continued program operation at current capacity. Higher completion numbers are achievable but contingent upon resolving laboratory space, staffing, and tool room limitations. The program will continue to track completion and transfer data through the Program Awards Dashboard, Chancellor's Office DataMart, and Compton College Institutional Effectiveness resources, using this data to refine projections and adjust program planning as capacity expands.

9. Recommendations Emerging from Data Analysis

The data reviewed across enrollment, success, retention, scheduling, and completion converge on a clear and consistent finding: the HVACR program has strong student interest, effective instruction, and genuine workforce relevance — but its capacity to fully serve students is constrained by

unresolved structural barriers. The following recommendations address both immediate operational needs and longer-term program development priorities.

Recommendation 1: Resolve Laboratory Space Deficiency Adequate, dedicated laboratory space is the foundational requirement for everything else the program needs to accomplish. Without it, class sizes cannot safely increase, additional sections cannot be offered, and the hands-on instruction that defines HVACR education cannot be delivered at the level students and industry require. This is the program's most urgent capital need and should be treated as a prerequisite for all other capacity-building efforts. *Funding required: Yes — facilities assessment, renovation or relocation costs to be determined in coordination with Facilities and Administration.*

Recommendation 2: Hire an Additional Part-Time HVACR Instructor A single instructor cannot safely and effectively serve the lecture, laboratory supervision, and student support needs of a growing program. Hiring at least one additional part-time instructor is necessary to expand section offerings, maintain appropriate student-to-instructor ratios, and provide students with the level of instructional support required for success in a technical, equipment-intensive field. *Estimated cost: Approximately $8,000–$15,000 per semester depending on assignment, benefits eligibility, and collective bargaining agreement terms.*

Recommendation 3: Establish a Full-Time Tool Room Attendant Position The absence of dedicated tool room support continues to reduce lab efficiency, divert instructor time from teaching, and create safety and readiness gaps. A full-time Tool Room Attendant would manage equipment inventory, maintain lab safety compliance, prepare materials for each instructional session, and ensure that tools and equipment are properly maintained and available. This position would have a direct and measurable impact on instructional quality and lab operations. *Estimated cost: Approximately $45,000–$60,000 annually, including salary and benefits, depending on classification.*

Recommendation 4: Strengthen Student Progression and Advising Infrastructure As enrollment recovers and the student pipeline deepens, clear and consistent advising support will be essential to keeping students on track toward certificate and degree completion. The program recommends establishing structured advising touchpoints, clear course sequencing guidance, and early-alert protocols to identify and support students at risk of delay or withdrawal. *Funding required: Potential counseling or advising resources — to be coordinated with Student Services.*

Recommendation 5: Expand Scheduling to Meet Student Demand Once space and staffing barriers are addressed, the program should expand section offerings and explore the addition of daytime sections to serve students whose schedules are not compatible with evening-only courses. Increased scheduling flexibility will improve access, support equitable participation, and reduce time to completion. *Funding required: Tied to Recommendations 1 and 2 above.*

Recommendation 6: Maintain Data-Informed Program Planning The program will continue to use disaggregated enrollment, success, retention, and completion data — alongside SLO assessment results and student survey feedback — as the primary basis for program decision-making. Regular review of these data sources will allow the program to identify emerging equity gaps, monitor the impact of structural improvements, and demonstrate measurable return on institutional investment through improved student outcomes and workforce preparation. *No additional funding required.*

Together, these recommendations reflect the program's commitment to equitable access, instructional excellence, and long-term operational stability. Addressing the structural barriers identified in both the 2021 and current program reviews is not simply a matter of program improvement — it is a prerequisite for fulfilling the institution's mission to prepare students for meaningful, skilled employment in a high-demand industry.

J) Technology and Software

- Current Technology and Software: Assessment of Adequacy and Currency

  The HVACR program currently operates with a minimal technology footprint. Instruction is delivered primarily through traditional lecture, hands-on demonstration, and physical laboratory practice — approaches that remain foundational to HVACR education but are no longer sufficient on their own to reflect the full scope of modern industry practice or to address the program's ongoing space constraints.

  At present, the program lacks access to:

  - **Interactive simulation platforms** that allow students to practice installation procedures, troubleshooting sequences, and diagnostic workflows in a structured virtual environment
  - **Digital diagnostic tools** that reflect the electronic service interfaces, monitoring systems, and software-assisted troubleshooting processes students will encounter in the field
  - **Controls and automation software** that provides exposure to programmable logic controllers, building automation systems, and energy management interfaces increasingly present in commercial and industrial HVACR work
  - **Airflow modeling and system design tools** that support student understanding of load calculations, duct performance, and system balancing
  - **Modern classroom presentation infrastructure** capable of supporting integrated digital demonstrations, system diagrams, and interactive instructional content

  The absence of these resources creates two compounding problems. First, it limits the program's ability to reflect current industry practices — the HVACR field has shifted significantly toward digital diagnostics, automated controls, and software-integrated service workflows, and students who graduate without exposure to these tools enter the workforce at a disadvantage. Second, it restricts instructional capacity: because the program depends almost entirely on physical equipment and lab stations to deliver technical training, space constraints directly cap what students can learn and how many students can be served simultaneously. Digital instructional tools can partially offset physical space limitations by expanding the range of scenarios, system types, and technical procedures students can access — but this resource does not currently exist in the program.

  In its current state, the HVACR program's technology environment is functional but inadequate. It does not reflect industry trends, does not sufficiently complement physical lab instruction, and does not provide the flexibility needed to support enrollment growth or instructional expansion. Addressing this gap is both an instructional priority and a strategic necessity.

Immediate Technology and Software Needs (Years 1–2)

The following technology and software investments are needed within the next one to two years to meaningfully improve instructional effectiveness, expand learning capacity, and ensure that students are entering the workforce with the technical literacy modern employers expect.

Industry-Aligned Digital Simulation and Training Platform

Description: The single most impactful immediate investment the program can make is implementation of a comprehensive digital training platform with simulation capabilities — such as **Interplay Learning** or an equivalent industry-aligned LMS with virtual and augmented reality training modules. These platforms allow students to practice installation, maintenance, troubleshooting, and safety procedures across multiple system types — residential, commercial, and refrigeration — in a structured, repeatable virtual environment.

Why this matters: Because the program's physical lab space is constrained, students currently have limited opportunities to practice complex procedures repeatedly or to encounter the full range of system types they will work with in the field. Simulation fills this gap directly. Students who complete virtual practice prior to lab sessions arrive better prepared, require less introductory instruction time, retain technical concepts more effectively, and demonstrate greater confidence when working on physical equipment. Instructors can reallocate time from basic orientation and demonstration toward higher-level skill development and individualized support.

This technology also has direct enrollment implications. A digital training platform allows more students to engage in structured learning simultaneously without competing for the same lab stations or equipment. This effectively expands instructional capacity without requiring additional physical space — a critical advantage given current facility constraints.

Estimated Cost: $10,000–$18,000 annually for institutional licensing, depending on student seat count and feature access. Initial implementation may include one-time setup or integration costs of $2,000–$4,000.

Impact if not addressed: Without simulation capability, the program remains limited by its physical footprint. Enrollment cannot grow safely, students gain less exposure to diverse system types, and instructors continue to be constrained by equipment availability. The program also risks appearing outdated to prospective students and industry partners who expect modern training environments.

Digital Diagnostic and Electronic Service Tools

Description: Modern HVACR technicians use electronic service interfaces, digital manifold gauges, software-based diagnostic platforms, and electronic reporting tools as standard components of professional practice. Students must gain familiarity with these tools during training — not after graduation. The program needs access to digital diagnostic software and service tools that reflect current industry standards, including electronic refrigerant charging calculators, digital pressure and temperature analysis tools, and structured service documentation platforms.

Why this matters: Graduates who are unfamiliar with digital service tools require additional on-the-job training that employers must absorb. Programs that integrate these tools into instruction produce

graduates who are immediately more employable and more productive from their first day in the field. This directly strengthens employer confidence in the program and supports workforce placement outcomes — a key metric for CTE program accountability and institutional ROI.

Estimated Cost: $5,000–$12,000 for initial licensing and toolset acquisition, depending on vendor, platform scope, and the number of student access points required.

Impact if not addressed: Students graduate without familiarity with tools that are standard in the field, reducing their competitive advantage in the job market and limiting employer confidence in program outcomes. This weakens the program's workforce reputation and may reduce enrollment referrals from industry partners.

Classroom Instructional Technology Infrastructure

Description: The program requires updated classroom display systems, reliable instructor workstations, and structured student access to digital learning materials to support integrated instructional delivery. Current infrastructure does not adequately support the integration of simulation demonstrations, digital system diagrams, troubleshooting visualizations, or interactive instructional content into daily teaching.

Specific needs include:

- High-resolution display system for instructional demonstrations
- Updated instructor workstation capable of running simulation and diagnostic platforms
- Student access to computers or tablets for structured use of digital training modules
- Reliable connectivity infrastructure to support platform access during class sessions

Why this matters: These infrastructure elements are prerequisites for using any of the digital training tools identified above. Without adequate display and computing infrastructure, instructional software cannot be effectively demonstrated, modeled, or practiced in a classroom setting. This is not an optional enhancement — it is the foundational layer that makes all other technology investments functional.

Estimated Cost: $8,000–$15,000 for display systems, workstations, and installation, depending on configuration and existing infrastructure compatibility.

Impact if not addressed: Technology investments in simulation and diagnostic platforms cannot be effectively deployed without supporting classroom infrastructure. Failing to address this baseline need would reduce the return on any other technology investment made in the program.

Need	Estimated Cost	Timeline
Digital simulation/training platform (annual licensing)	$10,000–$18,000/year	Year 1
Digital diagnostic and service tools	$5,000–$12,000	Year 1
Classroom instructional technology infrastructure	$8,000–$15,000	Year 1–2
Total estimated immediate investment	**$23,000–$45,000**	**Years 1–2**

- **Long-Range Technology and Software Needs (Years 2–4+)**

  As the program stabilizes, enrollment grows, and physical space constraints are addressed, the long-range technology vision is the development of a **fully integrated digital training ecosystem** — one in which simulation platforms, advanced controls software, energy analysis tools, and smart instructional infrastructure work together to support instruction across the full breadth of modern HVACR practice.

  Long-Range Need 1: Advanced Simulation and Expanded Virtual Training Modules

  Description: As the program matures beyond foundational simulation, it should expand its digital training library to include advanced modules covering commercial refrigeration, chiller systems, advanced electrical troubleshooting, airflow modeling, and complex multi-system diagnostics. These expanded simulation capabilities allow the program to teach at a higher technical level without requiring proportional increases in physical equipment inventory.

  Estimated Cost: $15,000–$25,000 annually as platform usage scales with enrollment growth, plus periodic module acquisition costs of $3,000–$8,000 for specialized content packages.

  Impact if not addressed: Without advanced simulation content, the program's instructional depth is capped by its physical equipment inventory. Students seeking preparation for commercial or industrial HVACR careers — typically higher-wage sectors — receive inadequate exposure to the system types and complexity they will encounter in those roles.

  Long-Range Need 2: Building Automation, Controls Programming, and Energy Management Software

  Description: The commercial HVACR industry is increasingly defined by integration with building automation systems (BAS), energy management platforms, and programmable control environments. Students entering commercial or industrial work settings are expected to understand — at minimum — how HVACR systems interface with BAS networks, how to read and navigate digital building control interfaces, and how energy performance data is monitored and reported.

  The program should pursue access to software platforms and training tools that introduce these environments, including:

  - Building automation system visualization and navigation tools
  - Controls programming simulation environments (introductory level)
  - Energy monitoring and efficiency reporting software
  - Indoor air quality monitoring platform interfaces

  Estimated Cost: $20,000–$40,000 in phased licensing and hardware integration over a two-to-four-year timeline, depending on platform selection and the scope of integration with existing instructional infrastructure.

  Impact if not addressed: Graduates who lack exposure to building automation and energy management systems are effectively limited to residential service roles. Commercial and industrial HVACR sectors — which offer higher wages and stronger career advancement — increasingly

require at least introductory familiarity with these platforms. Without this exposure, the program undersells its graduates' potential and fails to prepare students for the full range of workforce opportunities available to HVACR technicians.

Long-Range Need 3: Technology-Enhanced Instructional Spaces

Description: As the program secures improved laboratory space — a priority identified throughout this review — those spaces should be designed from the outset as technology-enhanced instructional environments. This means integrating advanced display systems, digital troubleshooting interfaces, simulation-capable workstations, and hybrid-ready instructional infrastructure into the physical layout of new or renovated lab spaces.

A technology-enhanced lab allows instructors to transition fluidly between physical equipment demonstration, digital simulation, system visualization, and individual student practice within a single instructional environment. It also supports hybrid or supplemental online delivery for theory components and enables more individualized instruction by giving students independent access to digital learning modules during lab sessions.

Estimated Cost: $30,000–$60,000 for integrated technology infrastructure within a new or renovated lab space, depending on square footage, equipment selection, and the scope of digital integration. This cost should be planned as part of any facility renovation or relocation project budget.

Impact if not addressed: If new laboratory space is secured but not designed with technology infrastructure in mind, the program will face the cost and disruption of retrofitting technology later — at higher expense and with greater operational disruption. Planning technology integration into facility improvements from the beginning is significantly more cost-effective and educationally sound.

Need	Estimated Cost	Timeline
Advanced simulation modules and platform expansion	$15,000–$25,000/year + $3,000–$8,000 module costs	Years 2–4+
Building automation, controls, and energy management software	$20,000–$40,000 (phased)	Years 2–4
Technology-enhanced instructional space infrastructure	$30,000–$60,000	Tied to facility improvement timeline
Total estimated long-range investment	**$65,000–$125,000+**	**Years 2–4+**

- **Technology and Software Recommendations**

The following recommendations consolidate the technology needs identified in this section into a structured, prioritized action plan. Each recommendation is framed around its educational value, its institutional return on investment, and its role in supporting the program's long-term growth and sustainability.

Recommendation 1: Adopt a Phased Technology Implementation Plan Beginning Immediately

The program should pursue technology investment in two clearly defined phases — an immediate phase focused on simulation, diagnostic tools, and classroom infrastructure, and a long-range phase focused on advanced controls software, building automation exposure, and technology-enhanced facility design. A phased approach allows the program to realize near-term instructional improvements while planning responsibly for more substantial investments aligned with facility and enrollment growth.

Estimated cost: See Sections 7b and 7c above. Immediate phase: $23,000–$45,000. Long-range phase: $65,000–$125,000+.

Maintenance and upgrades: Annual technology maintenance and software renewal costs should be budgeted at approximately **10–15% of initial investment value** — approximately $3,000–$7,000 per year for immediate-phase tools, scaling as the platform expands.

Recommendation 2: Prioritize Investments That Directly Address Space Constraints

Given the program's current facility limitations, the highest-return technology investments are those that expand instructional capacity without requiring additional physical space. Digital simulation platforms and virtual training modules directly accomplish this by enabling more students to engage in technical practice simultaneously, without competing for physical lab stations. This makes simulation technology one of the most cost-effective investments available to the program — it improves learning outcomes and supports enrollment growth in parallel.

Estimated cost: Included in Recommendation 1 above.

Recommendation 3: Explore Consolidation and Shared Licensing Opportunities

Some foundational instructional software — particularly tools related to electrical safety, general technical troubleshooting, and workplace safety orientation — may be appropriate for shared use across multiple technical programs at the college. The program recommends exploring cross-department licensing arrangements with related CTE programs (Electrical Technology, Construction, Automotive) where instructional overlap exists and shared use would reduce per-program costs without compromising HVACR-specific instructional integrity.

HVACR-specific diagnostic, refrigerant, and controls simulation software must remain program-dedicated to maintain alignment with industry standards and certification expectations. Shared licensing arrangements are appropriate only for general foundational tools.

Estimated savings potential: $2,000–$6,000 annually through shared licensing arrangements, depending on platform and enrollment volume.

Recommendation 4: Integrate Technology Planning into Facility Improvement Efforts

Any proposal for expanded or renovated HVACR laboratory space should include a dedicated technology infrastructure budget from the outset. Designing lab spaces with integrated display systems, simulation-capable workstations, and digital troubleshooting interfaces is significantly

more cost-effective than retrofitting technology into existing spaces after construction. The program recommends that facilities planning and technology planning be coordinated as a unified initiative rather than managed as separate budget requests.

Estimated cost: $30,000–$60,000 for technology integration within new or renovated lab space — to be included as a line item in any facility improvement proposal.

Recommendation 5: Establish a Formal Technology Review Cycle

Technology investments lose instructional value rapidly if they are not systematically updated and evaluated. The program recommends establishing a formal annual technology review as part of its program planning cycle — assessing whether current platforms remain aligned with industry practice, identifying software that requires renewal or replacement, and planning upgrade timelines that prevent large, sudden replacement costs. This review should incorporate advisory committee input to ensure that technology decisions remain grounded in current workforce expectations.

Estimated cost: No additional funding required — embedded in existing program review and advisory committee processes. Annual renewal and upgrade costs should be anticipated in the program's operational budget as described above.

Recommendation 6: Align Technology Investment with Certification Preparation Goals

All technology acquisitions should be evaluated in part based on their ability to strengthen student preparation for the EPA Section 608 certification exam and other industry credentials. Simulation platforms and digital training tools that directly reinforce certification content domains — refrigerant safety, system diagnostics, EPA regulatory knowledge, and service procedures — provide the highest instructional return for the program's certification preparation goals. Technology selection should be guided by this alignment criterion in addition to general instructional value.

Estimated cost: No additional cost beyond investments already identified — this recommendation governs selection criteria rather than introducing new spending categories.

Technology Recommendation Summary

Recommendation	Estimated Cost	Funding Considerations
Phased technology implementation (immediate)	$23,000–$45,000	Perkins V, institutional budget, CTE categorical
Phased technology implementation (long-range)	$65,000–$125,000+	Perkins V, grants, facility budget
Annual maintenance and renewals	$3,000–$7,000/year (scaling)	Operational budget
Shared licensing exploration	Potential savings of $2,000–$6,000/year	Cross-department coordination
Technology integration in facility improvements	$30,000–$60,000	Facility improvement proposal
Annual technology review cycle	No additional cost	Program planning process

Closing Statement

Technology investment in the HVACR program is not an amenity — it is an instructional and strategic necessity. The modern HVACR industry is increasingly defined by digital diagnostics, automated controls, energy management systems, and software-integrated service workflows. A program that does not reflect these realities in its instructional environment does a disservice to its students and undermines its own workforce preparation mission.

At the same time, technology investment offers the program one of its most scalable paths to growth. Digital simulation and training platforms can expand instructional capacity, partially offset physical space constraints, improve certification pass rates, strengthen student retention, and increase the program's competitive appeal — all simultaneously. The investments identified in this section are carefully sequenced to deliver meaningful near-term improvements while building toward a long-range digital instructional ecosystem that positions the HVACR program as a modern, competitive, and workforce-aligned training program. The return on these investments — measured in improved student outcomes, stronger employer relationships, higher enrollment, and greater institutional FTES generation — is both real and measurable.

K) Staffing

- **Current Program Staffing and Impact of Unmet Needs**

The HVACR program is currently operating with a limited staffing structure that does not fully reflect the instructional and operational demands of a hands-on, laboratory-intensive technical program. Instruction is currently centered on a single faculty member who carries responsibility for lecture and laboratory instruction as well as a range of additional program functions, including curriculum planning, laboratory preparation, equipment coordination, student advising, industry communication, and day-to-day program operations.

The program currently does not have a dedicated classified staff member assigned to HVACR for tool room operations, equipment preparation and maintenance, inventory management, or laboratory logistics. Administrative support is provided through shared division resources rather than through a position dedicated specifically to the program. While this arrangement has allowed the program to remain operational, it places substantial demands on instructional personnel and limits the program's ability to expand.

The staffing structure is particularly challenging because HVACR instruction requires a significant amount of preparation and direct supervision. Unlike lecture-based programs, HVACR laboratory courses require instructors to prepare equipment and tools, organize workstations, monitor student activities, reinforce safety procedures, troubleshoot equipment, and provide individualized technical guidance. These responsibilities must occur in addition to normal instructional and assessment duties.

When instructional faculty are also responsible for equipment preparation, inventory, tool management, and laboratory logistics, less time is available for direct student interaction and individualized instruction. This can be especially challenging as enrollment increases and students require different levels of technical support during hands-on activities.

The absence of additional staffing also limits the program's ability to offer multiple laboratory sections, increase course availability, or accommodate growing enrollment. Without adequate instructional and operational support, expanding enrollment could create larger laboratory groups without a corresponding increase in supervision and equipment support. Such a situation could negatively affect the quality of hands-on instruction and create additional challenges related to laboratory safety.

If current staffing levels remain unchanged, the program will likely continue to face constraints in several key areas, including enrollment growth, course scheduling, laboratory capacity, student progression, equipment management, and instructional quality. Students may experience difficulty accessing required courses when needed, potentially extending the time required to complete certificates or degrees. Continued reliance on a single instructor for both instructional and operational responsibilities may also make the program more vulnerable to disruptions and limit its ability to sustain growth following its recent restart.

For these reasons, staffing should be viewed as an essential component of the program's overall infrastructure. Adequate instructional and classified support will be necessary for the HVACR program to expand responsibly while maintaining a safe, organized, and effective learning environment.

- **Immediate and Long-Term Staffing Needs**

  The HVACR program has identified staffing priorities for both the immediate one- to two-year period and the longer two- to four-year planning horizon. These needs are directly connected to enrollment growth, laboratory capacity, course sequencing, student access, and the program's ability to provide comprehensive hands-on technical training.

- **Immediate Staffing Need: Part-Time HVACR Faculty**

  The most immediate instructional priority is the addition of at least one part-time HVACR faculty member. As the program rebuilds its enrollment and restores additional courses to the schedule, the current single-instructor structure will increasingly limit the number of sections and laboratory opportunities that can be offered.

  An additional part-time instructor would provide greater flexibility in scheduling lecture and laboratory sections, increase instructional capacity, and allow students to receive more individualized technical assistance during hands-on activities. Additional faculty capacity would also help reduce scheduling bottlenecks and support a more predictable progression through the HVACR course sequence.

  The estimated cost of a part-time instructional position is approximately **$25,000–$40,000 annually**, depending on teaching load and applicable salary and benefits structures.

  This investment would provide the program with greater capacity to respond to enrollment demand while maintaining appropriate instructional attention and laboratory supervision. It could also contribute to increased FTES generation as additional sections become feasible.

If this need is not addressed, the program may be unable to expand course offerings at the pace necessary to accommodate returning and prospective students. Students could encounter limited section availability or delays in completing required coursework, while the existing faculty member would continue to carry both instructional and operational responsibilities.

- **Immediate Staffing Need: Classified Laboratory/Tool Room Support**

  A second immediate priority is the establishment of a dedicated full-time classified support position, such as a Tool Room Attendant or comparable laboratory support role, for HVACR operations.

  This position would provide essential operational support, including:

  - Tool distribution, collection, and tracking
  - Equipment preparation and organization
  - Inventory management
  - Laboratory setup and breakdown
  - Coordination of instructional materials and supplies
  - Routine equipment organization and maintenance support
  - Support for laboratory safety procedures
  - Preparation of workstations for hands-on activities

  At present, many of these responsibilities are performed by instructional staff. Transferring appropriate operational duties to dedicated classified support would allow faculty to devote more time to teaching, assessment, student advising, and curriculum development.

  The estimated annual cost for a full-time classified position, including salary and benefits, is approximately **$60,000–$80,000**, depending on classification and compensation structure.

  This position would improve laboratory efficiency and organization while providing a more consistent approach to equipment and tool management. It would also support safer laboratory operations by ensuring that equipment and work areas are appropriately prepared before instruction begins.

  Without dedicated laboratory support, faculty will continue to divide their time between instructional responsibilities and operational tasks. As enrollment and equipment inventories increase, this arrangement may become increasingly difficult to sustain and could limit the program's ability to expand laboratory activities.

- **Long-Term Staffing Need: Full-Time Faculty**

  If enrollment continues to increase and the program restores its full course sequence, the long-term staffing plan should include consideration of an additional full-time HVACR faculty position.

  A full-time faculty member would provide greater instructional stability and support the program's transition from rebuilding toward sustained growth. In addition to teaching responsibilities, a full-time faculty member could contribute to curriculum development, SLO/PLO assessment, student advising, industry engagement, equipment planning, program recruitment, and development of additional instructional offerings.

Additional full-time faculty capacity could also allow the program to consider expanded scheduling options, including additional laboratory sections or alternative scheduling where enrollment demand supports them.

The estimated cost of a full-time faculty position is approximately **$90,000–$120,000 annually**, including salary and benefits.

This position should be considered as a longer-term investment tied to demonstrated enrollment growth and expanded course demand rather than as an immediate requirement. Establishing clear enrollment and scheduling benchmarks for future faculty hiring would allow the College to align staffing growth with actual program demand.

If this position is not added as the program expands, the existing instructional structure may eventually become insufficient to support additional enrollment and course offerings. Continued dependence on limited faculty capacity could constrain program growth, reduce scheduling flexibility, and place additional demands on existing instructional personnel.

Staffing Priorities and Implementation

A phased staffing strategy would allow the program and College to align staffing investments with enrollment growth and demonstrated instructional demand. The recommended sequence is:

Priority	Staffing Need	Estimated Annual Cost	Planning Horizon
1	Part-time HVACR faculty	$25,000–$40,000	Immediate: 1–2 years
2	Full-time classified Tool Room/Lab Support	$60,000–$80,000	Immediate: 1–2 years
3	Additional full-time HVACR faculty	$90,000–$120,000	Long-term: 2–4+ years

This approach would allow staffing levels to grow in parallel with enrollment, course offerings, laboratory capacity, and program development. It would also reduce the risk of expanding enrollment without the personnel necessary to support safe and effective instruction.

- **Related Staffing Recommendations**

The HVACR program recommends adopting a structured, phased staffing strategy that connects personnel decisions to enrollment trends, course demand, laboratory capacity, and program expansion. Staffing needs should be reviewed regularly so that additional personnel can be requested before staffing shortages begin to affect student access or instructional quality.

The first priority should be increasing instructional capacity through part-time faculty support as enrollment and course offerings expand. This would provide immediate flexibility while allowing the College to evaluate long-term enrollment trends before making additional full-time faculty commitments.

The second priority should be dedicated classified laboratory and tool room support. Because HVACR is equipment-intensive and laboratory-based, this role is directly connected to instructional effectiveness. Consistent management of tools, equipment, materials, and laboratory preparation would improve operational efficiency and allow faculty to concentrate more fully on instruction and student support.

The program should also explore opportunities to share appropriate administrative or operational resources with other career and technical education programs. Where feasible, common functions such as purchasing coordination, scheduling assistance, or selected administrative processes could be shared to reduce duplication and improve efficiency. However, specialized HVACR laboratory functions—including tool management, equipment preparation, and technical laboratory support—should remain sufficiently dedicated to the program because of the specialized nature of the equipment and safety requirements.

The program further recommends incorporating staffing needs into the regular program planning and resource allocation process. Annual review of enrollment, FTES, course fill rates, student progression, laboratory capacity, and faculty workload would provide a more objective basis for determining when additional staffing is warranted.

Staffing decisions should also be coordinated with the program's broader facilities and equipment modernization plans. Additional equipment, laboratory space, and course offerings will increase operational demands and may require corresponding increases in instructional and classified support. Planning these resources together will help prevent situations in which the program expands its physical capacity without sufficient personnel to operate it effectively.

Finally, the program should continue to evaluate opportunities for industry engagement in supporting instructional capacity. Qualified industry professionals may be able to contribute as guest instructors, advisory committee members, or part-time faculty where appropriate and where institutional hiring requirements permit. Industry participation can supplement—but should not replace—the core staffing needed to maintain a stable instructional program.

- **Overall Staffing Assessment**

  Adequate staffing is fundamental to the success of a laboratory-intensive HVACR program. The current staffing model has allowed the program to continue operating and rebuilding following its restart, but it provides limited capacity for significant growth. The combination of instructional, laboratory, equipment, advising, and program-management responsibilities currently concentrated within a very small staffing structure creates a significant constraint on future development.

  The recommended staffing investments are therefore directly connected to the program's goals for student access, safety, workforce preparation, enrollment growth, and long-term sustainability. In the immediate term, the addition of **part-time faculty and dedicated classified laboratory support** would provide the most direct benefit by increasing instructional capacity and reducing the operational burden on faculty. Over the longer term, an **additional full-time faculty position** would provide the instructional stability necessary to support continued expansion.

  The estimated annual staffing investment associated with these priorities ranges from approximately **$85,000–$120,000 for the two immediate priorities**, depending on the actual hiring configuration,

with an additional **$90,000–$120,000 annually** for a future full-time faculty position. These investments should be phased according to enrollment and program demand.

If staffing needs remain unmet, the program will continue to face limitations in course availability, laboratory supervision, equipment management, student progression, and enrollment growth. Conversely, strategic staffing investments will provide the personnel capacity necessary to operate a safe and effective laboratory environment, increase student access to coursework, improve instructional efficiency, and support the HVACR program's development into a sustainable workforce-training pathway.

L) Direction and Vision

- **Industry Changes, Emerging Trends, and Their Impact on the Program**

The Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) industry is undergoing significant changes driven by advances in technology, evolving environmental requirements, energy-efficiency priorities, and continued demand for skilled technicians. These changes are expected to have a substantial impact on the HVACR program over the next four years and will require continued curriculum development, equipment modernization, faculty development, and stronger connections with industry.

One of the most significant developments affecting the industry is the transition toward **lower-global-warming-potential refrigerants, including A2L-class refrigerants**. As refrigerant technologies and regulatory requirements evolve, technicians must understand not only traditional refrigeration practices but also the appropriate handling, installation, safety procedures, leak detection methods, and system requirements associated with newer refrigerants. This transition represents a major change in the knowledge and skills expected of entry-level HVACR technicians.

For the program, this shift creates a need to incorporate emerging refrigerant technologies more comprehensively into classroom and laboratory instruction. Students will need opportunities to work with modern systems and understand the safety considerations associated with newer refrigerants. Updating training equipment and laboratory infrastructure will therefore be increasingly important to ensure that students are prepared to enter workplaces where these technologies are becoming standard.

Another major industry trend is the increasing integration of **electronic controls, digital diagnostics, building automation, smart technologies, and system monitoring**. HVACR systems are becoming increasingly connected and data-driven, requiring technicians to understand more than mechanical components alone. Modern technicians may be expected to interpret electronic controls, evaluate system performance, identify faults using diagnostic technologies, monitor operating conditions, and work with increasingly sophisticated control systems.

This evolution expands the technical expectations placed on HVACR graduates. The program will need to continue strengthening instruction in electrical systems, electronic controls, diagnostics, system performance, and building automation. Providing students with opportunities to work with modern control technologies will help ensure that graduates possess skills that reflect current employment expectations rather than being trained primarily on legacy equipment.

The industry is also experiencing sustained demand for skilled HVACR workers. Aging building infrastructure, continued construction, population growth, equipment replacement, and the increasing need for climate-controlled environments are contributing to demand for qualified technicians. At the same time, the retirement of experienced technicians is creating additional workforce replacement needs. Specialized facilities, including healthcare environments, data centers, commercial buildings, and technology-dependent manufacturing facilities, are also increasing demand for technicians with more specialized knowledge.

These workforce conditions represent a significant opportunity for the HVACR program. The combination of high workforce demand and technological change provides a strong foundation for enrollment growth, employer partnerships, internships, work-based learning opportunities, and other workforce-development initiatives. The program can play an increasingly important role in preparing students for entry-level employment while also providing a foundation for continued advancement within the trade.

Another growing area of importance is **energy efficiency, indoor air quality, ventilation, and building performance**. HVACR technicians increasingly contribute to energy conservation, airflow management, equipment efficiency, ventilation, filtration, and indoor environmental quality. The broader emphasis on healthy and efficient buildings has expanded the role of HVAC professionals beyond traditional installation and repair.

These developments suggest that the HVACR technician of the future will need a broader combination of mechanical, electrical, digital, diagnostic, environmental, and customer-service skills. As a result, the program will need to continue evolving beyond traditional HVAC instruction and incorporate emerging technologies and applications into its curriculum.

Over the next four years, these industry changes are expected to influence the program in several areas:

- Modernization of laboratory equipment and training systems
- Increased instruction related to A2L and other emerging refrigerant technologies
- Expanded training in electronic controls and diagnostics
- Greater exposure to building automation and smart HVAC systems
- Increased emphasis on energy efficiency and system performance
- Expanded instruction related to indoor air quality and ventilation
- Potential development of specialized training related to data center and precision cooling
- Stronger employer and industry partnerships
- Increased opportunities for internships, work-based learning, and workforce pipelines

Collectively, these trends demonstrate that the HVACR field is becoming more technologically sophisticated while maintaining strong demand for skilled workers. The program's ability to respond to these changes will be critical to maintaining curriculum relevance, improving graduate employability, and establishing the program as a responsive regional workforce-development resource.

- **Direction and Vision of the Program**

  The long-term vision of the HVACR program is to develop into a **comprehensive, industry-responsive, and regionally recognized workforce-training pathway** that prepares students for both immediate employment and long-term advancement in the HVACR profession.

  The program is currently transitioning from a period of rebuilding toward a more stable and sustainable phase of development. The immediate priority is to establish a strong foundation for continued growth by strengthening course sequencing, rebuilding enrollment, improving instructional capacity, modernizing equipment, and ensuring that students can progress through the curriculum in a predictable manner.

  A successful future program should provide students with a clear pathway from foundational coursework through advanced technical competencies and completion of certificates or degrees. Students should be able to enter the program with limited prior technical experience, progressively develop their skills, and ultimately graduate prepared for employment, industry certification, apprenticeship opportunities, or continued education.

  In the near term, the program will focus on **stabilization and controlled growth**. This includes ensuring that required courses are available, improving course sequencing, increasing access to laboratory experiences, strengthening student advising, and addressing staffing and facility limitations that currently restrict growth. The objective is not simply to increase enrollment, but to increase enrollment in a manner that supports student retention, progression, completion, and workforce success.

  As the program becomes more stable, the longer-term vision is to develop a comprehensive HVACR training environment representing the major sectors of the industry. This would include residential, commercial, and industrial HVACR applications as well as specialized areas such as refrigeration, advanced controls, energy-efficient systems, indoor air quality, automation, and specialized cooling technologies.

  The ideal future program would provide students with access to modern equipment and realistic training environments that reflect the systems they are likely to encounter in the workforce. Rather than relying primarily on isolated instructional units or older equipment, students would have opportunities to complete installation, troubleshooting, diagnostics, controls, maintenance, and service activities using contemporary systems.

  The program also envisions expanding its role as a **regional workforce-development hub**. HVACR is essential to residential housing, commercial facilities, healthcare, education, manufacturing, infrastructure, and other critical sectors. By developing stronger relationships with employers and workforce organizations, the program can help create a direct connection between education and employment.

  Industry partnerships could support internships, employer demonstrations, equipment donations, advisory participation, site visits, work-based learning, and potential apprenticeship or employment pipelines. These partnerships would also provide the program with ongoing information about changes in workplace practices and employer expectations, helping faculty keep curriculum and training relevant.

Another important component of the program's future vision is the pursuit of **external funding and grant opportunities**. The program's goals align with broader workforce priorities related to skilled trades, energy efficiency, infrastructure modernization, environmental sustainability, and technical education. Pursuing external funding can provide additional resources for laboratory modernization, new equipment, instructional technology, faculty development, and student-support initiatives.

Grant development should therefore become a component of the program's longer-term resource strategy rather than relying exclusively on institutional operating funds. Strategic external funding could accelerate modernization while allowing the College to leverage institutional resources more effectively.

The program also seeks to strengthen its role in **economic mobility for the surrounding community**. HVACR careers provide opportunities for stable employment, advancement, specialization, and entrepreneurship. By expanding outreach and increasing awareness of these career opportunities, the program can attract students who may not otherwise consider a technical career and provide them with a pathway into a high-demand occupation.

Ultimately, the program's ideal future is a stable and growing HVACR pathway that combines strong foundational instruction with modern technology, hands-on training, industry engagement, and clear employment pathways. The goal is to create a program that serves students, employers, and the broader community while contributing meaningfully to the College's workforce-development mission.

- **Related Recommendations**

  To achieve the program's long-term direction and vision, several strategic recommendations are proposed. These recommendations are intended to support sustainable growth while ensuring that program development remains closely aligned with industry needs and student success.

  - **Establish a clear and predictable student pathway.**

    The program should continue developing a structured sequence that allows students to move from introductory HVACR coursework through intermediate and advanced technical training without unnecessary delays. Course availability, prerequisites, scheduling, and program milestones should be communicated clearly to students.

    A predictable pathway will help improve student progression and completion while reducing the likelihood that students stop out because required courses are unavailable when needed.

  - **Continue modernizing the curriculum and instructional equipment.**

    Curriculum development should continue to incorporate emerging technologies, including A2L refrigerants, electronic controls, energy-efficient systems, advanced diagnostics, building automation, indoor air quality, and specialized cooling applications.

    Equipment modernization should occur in phases, prioritizing technologies that have the greatest impact on workforce preparation and safety. This will help ensure that graduates train on systems that reflect contemporary industry practices.

- **Develop stronger and more sustained industry partnerships.**

The program should expand relationships with HVACR employers, contractors, manufacturers, workforce agencies, trade organizations, and community partners. Industry engagement should extend beyond advisory participation and include opportunities for internships, job placement, site visits, demonstrations, equipment donations, guest instruction, and work-based learning.

These partnerships can provide students with direct exposure to workplace expectations while also helping the program remain informed about emerging industry technologies and workforce needs.

- **Expand specialized and emerging training opportunities.**

As resources become available, the program should explore specialized training areas that reflect emerging workforce demand. Potential areas include indoor air quality, advanced controls and building automation, energy-efficient systems, and data center or precision cooling.

Adding these areas incrementally would allow the program to broaden its workforce relevance without requiring all specialized offerings to be developed simultaneously.

- **Pursue external funding and grant opportunities.**

The program should actively identify and pursue grants and other external funding sources related to career education, workforce development, energy efficiency, infrastructure modernization, environmental sustainability, and skilled-trades training.

External funding could support laboratory renovations, equipment acquisition, instructional technology, faculty professional development, and student-support activities. Developing a coordinated grant strategy would allow the program to pursue larger modernization projects that may not be achievable through annual operating funds alone.

- **Strengthen outreach and recruitment.**

The program should increase outreach to prospective students, high schools, adult learners, workforce agencies, and community organizations. Outreach should emphasize the range of career opportunities available within HVACR, including residential service, commercial systems, refrigeration, controls, energy efficiency, and specialized technical applications.

Highlighting career advancement, employment opportunities, and the practical nature of HVACR work can help increase awareness of the program and attract students interested in skilled-trade careers.

- **Align program growth with facilities and staffing capacity.**

Enrollment growth should occur in coordination with improvements to laboratory space, equipment, staffing, and safety infrastructure. Expanding enrollment without corresponding resources could negatively affect laboratory access and instructional quality.

The program should therefore establish a long-term planning framework in which enrollment, staffing, equipment, facilities, and course offerings are evaluated together.

- **Develop measurable milestones for the program's long-term vision.**

The program should establish measurable benchmarks for enrollment growth, course completion, certificate and degree completion, industry partnerships, employment outcomes, equipment modernization, and external funding. Regular review of these measures will allow faculty and administrators to determine whether the program is progressing toward its long-term goals and identify areas requiring additional intervention.

Overall Direction and Vision

The HVACR program is positioned at an important point in its development. The industry is experiencing strong workforce demand while simultaneously undergoing substantial technological and regulatory change. This creates both an opportunity and an obligation for the program to modernize its curriculum, facilities, equipment, staffing, and industry relationships.

The immediate objective is to stabilize and strengthen the program following its restart. The longer-term objective is to transform the program into a comprehensive HVACR training pathway capable of serving residential, commercial, and industrial workforce needs while introducing students to emerging technologies and specialized applications.

Achieving this vision will require coordinated investment in **people, facilities, equipment, curriculum, industry partnerships, and external funding**. With a phased and strategic approach, the program can expand without compromising instructional quality, improve student progression and completion, strengthen workforce outcomes, and increase its value to the College and surrounding community.

The ultimate goal is to establish an HVACR program that is not only responsive to today's workforce needs but also prepared for the technologies, regulations, and employment opportunities that will define the HVACR industry over the next decade.