



Atlantic Technical College

Heating, Ventilation, Air-Conditioning/Refrigeration Program Syllabus 2023-2024



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Department Name: Technical Trades
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Instructor Office Hours:
M-F: 5:30 PM- 6:00 PM
(By appointment only)

Student Hours:
Monday – Friday
6:00 PM- 9:45 PM
(Adults)

Break: 7:45 PM – 8:00 PM

NOTE: All students are expected to be present during their entire scheduled class time(s). All classroom breaks will occur on an “as needed” basis. The wall clock in the classroom will serve as the official time.

Program Name: Heating, Ventilation,
Air-Conditioning/Refrigeration
Career Cluster: Architecture and Construction

OCPs	Course Number / Title	Course Length
A	ACR0000/Introduction to HVAC/R	250 hours
B	ACR0001/HVAC/R Fundamentals	250 hours
C	ACR0012/HVAC/R Service Practices	250 hours
D	ACR0013/HVAC/R Intermediate Service Practices	250 hours
E	ACR0045/HVAC/R Advanced Commercial and Industrial Service Practices	<u>350 hours</u>
		1350 total hours (Including summer)

Technical College Policy/Adult Student Attendance:

- A student must be withdrawn after being absent for six (6) consecutive days.
- Two (2) additional absences may be allowed under certain circumstance with appropriate documentation.
- Please refer to the Broward Technical College Student Handbook for postsecondary students.
<http://www.atlanticttechnicalcollege.edu/atc-student-handbook/>

Magnet High School/Attendance Policy:

A student who has had at least five unexcused absences, or absences for which the reasons are unknown, within a calendar month, or 10 unexcused absences, or absences for which the reasons are unknown, within a 90-calendar-day period, may be exhibiting a pattern of non-attendance (F.S.1003.26 (1) (b)) and the School Board of Broward County, Policy 5.5.

<p>Required Book(s) and/or Online Access Available for purchase at the ATC Bookstore:</p> <ul style="list-style-type: none"> Modern Refrigeration and Air Conditioning; 21st Edition ISBN# <u>9781635638776</u> 	<p>Required Materials/Supplies Purchased from ATC Bookstore:</p> <ul style="list-style-type: none"> Safety glasses & Computer Headset (optional) <p>Not Purchased from ATC Bookstore:</p> <ul style="list-style-type: none"> Items to be covered throughout course
<p><i>All required books & most materials/supplies can be purchased from the school bookstore. Stop by during operational hours for pricing & purchasing information.</i></p>	
<p>ADULT STUDENTS: <i>All required books & some materials/supplies can be purchased from the school bookstore. Stop by during operational hours for pricing & purchasing information. All other required materials/ retail supplies not available at the bookstore need to be purchased elsewhere. All required books and required materials/retail supplies need to be obtained prior to the start of the program.</i></p> <p>HIGH SCHOOL STUDENTS: <i>Students receive all required books and most of the required materials/supplies on loan. High School students are responsible for the care and return of all of the required books and required materials/supplies on loan and will be issued an obligation for damaged or missing books and/or materials/supplies. Some of the required materials/supplies can be purchased from the school bookstore. Stop by during operational hours for pricing & purchasing information. All other required materials/retail supplies not available at the bookstore need to be purchased elsewhere.</i></p>	
<p>Grading System:</p> <p>A 90 - 100% B 80 - 89% C 70 - 79% D 60 - 69% F 0 - 59% I Incomplete</p>	<p>Additional Program Specific Grading Information:</p> <ul style="list-style-type: none"> Projects 25% Tests/Quizzes 25% Work Habits/Attend 25% Class Participation 25%
<p>Online Course Grading Policy: Not Applicable</p>	
<p>View Your Grades: Grades can be viewed online by following the directions below:</p> <ol style="list-style-type: none"> Go to https://browardfocus.com (access FOCUS using Chrome, Firefox or Safari) Student ID which is on your student schedule. Passcode: Student's date of birth formatted as PMM/DD/YYYY. <i>Two digits for the month, two digits for the day and Four digits for the year.</i> 	
<p>Classroom/Lab Rules:</p> <ol style="list-style-type: none"> Students are expected to be in their seats and ready to work when the bell rings. Students are required to adhere to the Code of Conduct at all times, as set forth by the School Administration and the Student Handbook. Students are to show respect to other students and the teacher at all times. Students are responsible to keep their personal belongings with them at all times. 	

5. All electronic devices must be silent and out of sight during instructional time. This includes cell phones, earbuds, smartwatches, headphones, mp3 players, etc. The school and/or teacher are not responsible for lost or stolen devices/personal belongings of any kind.
6. Computer use is a privilege and should only be used for researching HVAC/R-related information and to complete required assignments / classwork.
7. Students are expected to always maintain a clean and neat work area.
8. Students must notify teacher, in advance, if planning to miss a portion of class time(s) for ANY reason.
9. Students shall familiarize themselves and adhere to all safety procedures as noted in the Classroom Safety Manual.
10. Students shall put Project Tags on the equipment that are working on.
11. Students must not work on other student's tagged equipment.
12. Students are not allowed to utilize hand or power tools without the instructor's permission or instruction.
13. Absolutely no fighting or horseplay of any kind.

Accommodations:

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodation if needed, and develop a plan with their postsecondary service provider. The accommodation received in postsecondary education may differ from those received in secondary education.

Accommodation changes the way the student is instructed. Students with disabilities may need accommodation in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodation requested and provided should be maintained in a confidential file.

In addition to accommodation, some secondary students with disabilities (ESE) will need modifications to meet their special needs.

- Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Note: Postsecondary curriculum cannot be modified.

- Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP).
- If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP.
- The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course.

It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Industry Certification & State Credential**Exam Costs:**

- EPA Section 608 (Type I, Type II, Type III, and/or Universal) - \$25
- EPA R-410a - \$25
- H.E.A.T (*for high school students only*) - \$15
- HVAC Excellence; Employment Ready (*for adults*): Air Conditioning; Commercial Air Conditioning; Commercial Refrigeration; Electrical; Electric Heat; Gas Heat; Heat Pump - \$15 each
- Occupational Safety and Health Administration (OSHA) 10-hour Construction Safety Outreach Course - \$35

You may qualify for certification reimbursement of your exam cost(s) upon passing. Credential fees are subject to change.

Outstanding Student Recognition Information:

- A gold seal will be applied to a Program Completion Certificate or an Applied Technology Diploma if the student has earned a 3.5 GPA or higher in their Career and Technical Education (CTE) classes.
- Occupational Safety and Health Administration (OSHA) 10 Hour Construction Safety Outreach Course - \$35

Program Name: Heating, Ventilation, Air-Conditioning/Refrigeration (HVAC/R)

Course Number: ACR0000

Course Name: Introduction to HVAC/R

Occupational Completion Point: A

Intended Outcomes:

- 01.0 Demonstrate the importance of health, safety and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- 02.0 Explain the importance of employability and entrepreneurship skills.
- 03.0 Identify, use and maintain the tools and tool accessories used in the heating, air-conditioning and refrigeration industry.
- 04.0 Demonstrate mathematics knowledge and skills.
- 05.0 Read construction documents.
- 06.0 Explain the properties of matter and heat behavior.
- 07.0 Describe the history and concepts of heating, air-conditioning and refrigeration.
- 08.0 Demonstrate a practical knowledge of basic electricity & of the electrical components of heating, air-conditioning & refrigeration equipment.

Course Number: ACR0001

Course Name: HVAC/R Fundamentals

Occupational Completion Point: B

Intended Outcomes:

- 09.0 Demonstrate knowledge of electrical wiring in air-conditioning and refrigeration.
- 10.0 Troubleshoot heating, air-conditioning and refrigeration electrical control systems and their components.
- 11.0 Select and test electrical generation and distribution components for commercial heating and air conditioning systems.
- 12.0 Analyze fluids, pressures, refrigerants and related codes.
- 13.0 Evaluate heating, air-conditioning and refrigeration system components and accessories.
- 14.0 Fabricate and service the piping, tubing and fittings used in the heating, air-conditioning and refrigeration industry.
- 15.0 Maintain, test and troubleshoot electrical motors and their components for commercial heating and air-conditioning systems.

Course Number: ACR0012

Course Name: Services Practices

Occupational Completion Point: N/A (1st half of C is complete)

Intended Outcomes:

- 16.0 Utilize mechanical components of heating air-conditioning and refrigeration systems.
- 17.0 Operate solid-state electronics as used in heating, air-conditioning and refrigeration systems.
- 18.0 Utilize and operate mechanical refrigeration servicing and testing equipment.
- 19.0 Assist in the installation of a residential heating and air-conditioning system and determine start-up procedures.
- 20.0 Conduct start-up and check-out procedures for mechanical heating and air-conditioning systems.
- 21.0 Use combustion-type heating servicing and testing equipment.

22.0 Troubleshoot combustion gas valves and regulators as used in heating, air-conditioning, refrigeration and ventilation systems.
23.0 Understand the design of heating and cooling systems.
24.0 Make career plans.

Course Number: ACR0013

Course Name: HVAC/R Intermediate Services Practices

Occupational Completion Point: C (2nd half of C is complete)

Intended Outcomes:

25.0 Select appropriate commercial compressors.
26.0 Test and adjust commercial evaporative condensers.
27.0 Maintain, test and troubleshoot commercial evaporators.
28.0 Identify basic principles of heating, air conditioning, refrigeration and ventilation piping sizing.
29.0 Maintain, troubleshoot and repair commercial heating systems.
30.0 Discuss new technologies.
31.0 Interpret, use and modify construction drawings and specifications.
32.0 Troubleshoot and repair commercial heating and air-conditioning systems.

Course Number: ACR0045

Course Name: HVAC/R Advanced Commercial & Industrial Service Practices

Occupational Completion Point: E

Intended Outcomes:

45.0 Demonstrate knowledge of retail refrigeration systems.
46.0 Demonstrate knowledge of commercial and industrial refrigeration systems.
47.0 Demonstrate a working knowledge of electrical generation and distribution components for commercial heating and air conditioning systems.
48.0 Demonstrate a working knowledge of refrigeration-system vibration and insulation.
49.0 Apply commercial refrigeration-pipe sizing and troubleshooting procedures.
50.0 Use refrigeration-systems skills in commercial applications.
51.0 Demonstrate a working knowledge of refrigerated storage systems.
52.0 Diagnose, maintain and repair ice-making systems.
53.0 Use refrigeration electrical-system skills in commercial applications.
54.0 Maintain and troubleshoot commercial refrigeration systems.

The School Board of Broward County, Florida, prohibits any policy or procedure which results in discrimination on the basis of age, color, disability, gender identity, gender expression, national origin, marital status, race, religion, sex or sexual orientation. Individuals who wish to file a discrimination and/or harassment complaint may call the Director, Equal Education Opportunities/ADA Compliance Department at 754-321-2150 or Teletype Machine (TTY) 754-321-2158. Individuals with disabilities requesting accommodations under the Americans with Disabilities Act Amendments Act of 2008, (ADAAA) may call Equal Educational Opportunities/ADA Compliance Department at 754-321-2150 or Teletype Machine (TTY) 754-321-2158.