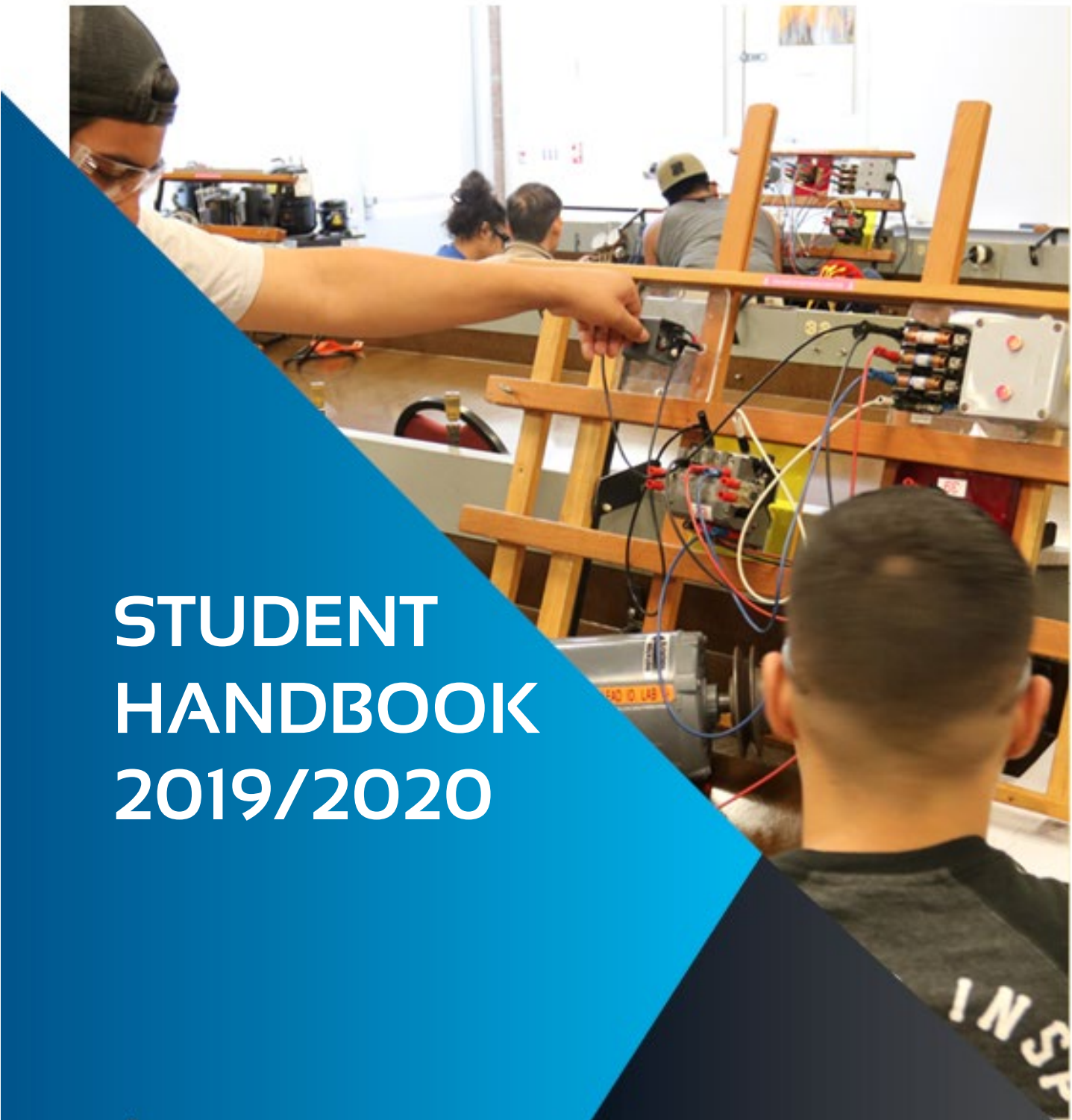


AIR CONDITIONING & REFRIGERATION TECHNOLOGY

A photograph of a classroom or lab setting. In the foreground, a student wearing safety glasses and a white shirt is reaching out to adjust a control knob on a piece of HVAC equipment. The equipment is mounted on a wooden frame and has various wires connected to it. In the background, other students are visible, also working on similar equipment. The scene is brightly lit, and the overall atmosphere is one of active learning and hands-on training.

STUDENT HANDBOOK 2019/2020

To provide quality education and training to a diverse student population, ranging from entry-level students to incumbent workers. So they obtain the necessary skills to be prepared in the sustainable industries of Air Conditioning, Refrigeration and Building Automation Systems

1100 N GRAND AVE
WALNUT, CA 91789
909.274.7500

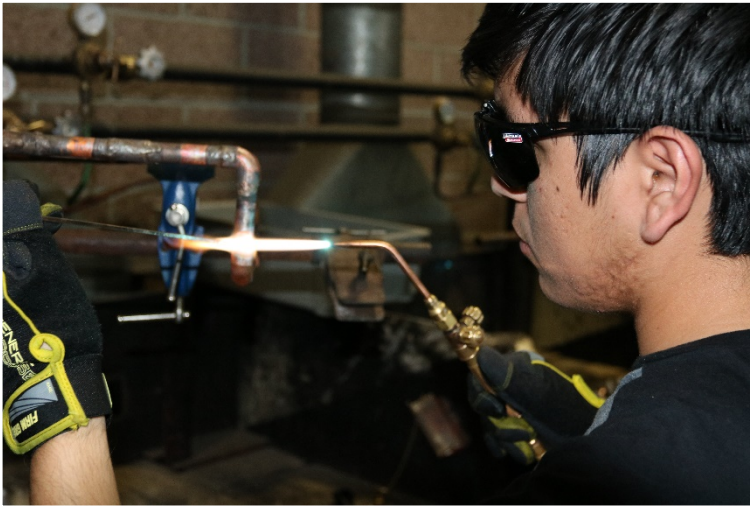
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Program Overview

Mt San Antonio College offers two certificate and degree programs in Air Conditioning & Refrigeration and Building Automation Systems.



The Air Conditioning and Refrigeration program was first offered in the early 70's and has a long standing reputation in the community as well as industry partners. The program design is to build a strong foundation for technical and mechanical skills required in the Heating, Ventilation, and Air Conditioning (HVAC) industry. Emphasis is placed on comprehension and troubleshooting of various electrical and mechanical systems



The Building Automation Systems (BAS) program arose out of an industry need for a higher level of electronic and solid-state technology understanding to better serve the digital side of the industry. A blended program explores the controls side of the HVAC industry but still requires a solid understanding of the mechanical systems found in many large facilities.

Job Outlook

Current data indicates that employment of heating, air conditioning, and refrigeration mechanics and installers is expected to grow 20% state-wide and 12 % nationally from 2016 to 2024. This is much faster than average for all occupations. Commercial and residential building construction will drive employment growth. The number of sophisticated climate-control systems is also expected to increase demand for qualified HVACR technicians.

The growing emphasis on energy efficiency and pollution reduction will require more HVACR technicians as climate-control systems are retrofitted, upgraded, or replaced entirely.



2017 Median Wage

State:	\$26.18 per hour	\$54.463 per year
National:	\$22.64 per hour	\$47,080 per year



Job Outlook

State:	3,530 new jobs	20% increase
National:	38,700 new jobs	15% increase



Quick Facts

Entry-level education:	Postsecondary non-degree award
Experience in related occupation:	None
On-the-job training:	Long-term on-the-job training



Source: O*Net Online
October 2018
www.onetonline.org

Skill Set

Customer-service skills. Technicians often work in customers' homes or business offices, so it is crucial that they be friendly, polite, and punctual. HVACR repair technicians must sometimes deal with unhappy customers whose heating or air conditioning is not working.

Detail oriented. Technicians must be able to find problems and make precise repairs or adjustments.. They must pay attention to details when installing or repairing equipment to ensure it works properly.

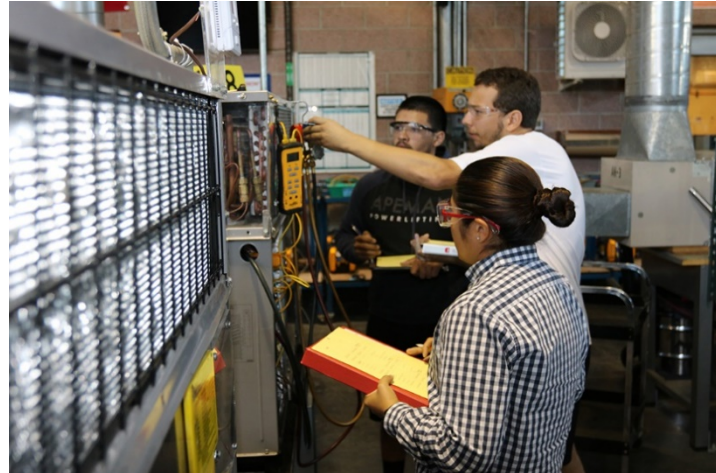
Dexterity. Technicians use many hand tools and must have good hand-eye coordination to avoid injury.

Mechanical skills. HVACR technicians install and work on complicated climate-control systems. Workers must understand the components and be able to properly assemble and disassemble them.

Physical strength. Workers may have to lift and support heavy equipment and components, often without help.

Time-management skills. HVACR technicians often have a set number of daily maintenance calls. They should be able to keep a schedule and complete all necessary repairs or tasks.

Troubleshooting skills. Heating, air conditioning, and refrigeration systems involve many intricate parts. To repair malfunctioning systems, technicians must be able to identify problems, often with sophisticated diagnostic equipment.



Equipment Maintenance

Perform routine maintenance on equipment and determine when and what kind of maintenance is required.



Troubleshooting

Determine causes of operating errors and deciding what to do about them.



Installation

Install equipment, machines, wiring, and programs to meet specifications.



Operation Monitoring

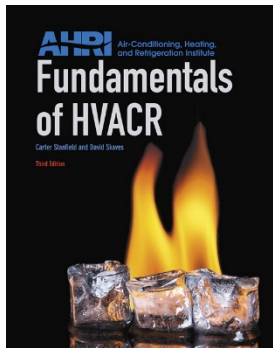
Watch gauges, dials, or other indicators to make sure the equipment is working properly.



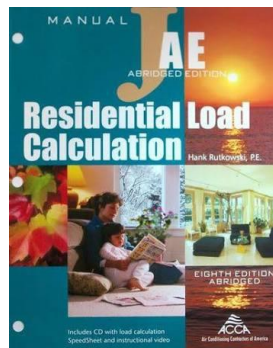
Quality Control Analysis

Conduct tests and inspections of products, services, and processes to evaluate quality or performance.

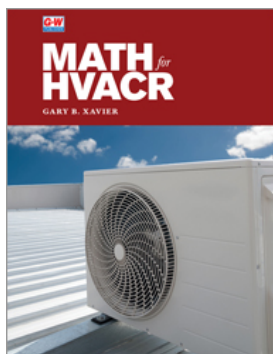
Textbooks



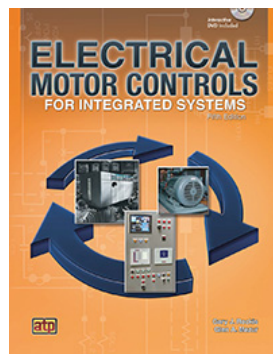
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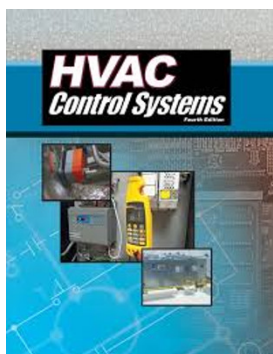
ISBN 9781892765260



ISBN 9781631269288



ISBN 9780826912268



ISBN 9780826907790



ISBN 9781938936944

The campus bookstore “SacBookRac” is located in Building 9A on the north end of campus. Students are encouraged to buy books early, especially if they are interested in purchasing used books (first-come/first-served).

Required books are listed in each course syllabus.

Tuition & Fees

Enrollment Fee: \$46/ unit required of all student residents of California except those who qualify for the California College Promise Grant (CCPG), a state financial aid program.

Student Activities Fee: \$11/semester (assessed during Fall and Spring semesters only). Supports various programs and services on campus including book grants, cultural programs, speakers, and discount tickets.

Student Representation Fee: \$0.50/semester (collected during Fall and Spring semesters only).

Student Health Fee: \$20 (\$15 with CCPG waiver) during Fall and Spring semesters. \$17 (\$12 with CCPG waiver) during Winter and Summer Intersession. Required for all credit students, including part-time students.

Student Transportation Fee: \$9 full-time students (\$8 part-time students). The fee is collected during the Fall and Spring Semesters only.

Parking Fee: \$50 (\$25 with CCPG waiver) and is required each term to use all student parking lots.

Materials Fee: This fee varies and is noted under the class listing at the end of the course description.

Admission Process

Students wishing to attend the programs must go online to www.mtsac.edu and click on the “Get Started” icon. You will be prompted to select the type of student and upon selection will be guided through the application and enrollment process. Please allow sufficient time to complete the process prior to the first day of class. Information will be sent to the student giving time and date when the student can register for classes.



Application Steps

Step 1 **Apply to Mt. SAC** **(909) 274-4415**

Computers are available in the Student Services Center for your convenience.

Step 2 **Apply for financial aid** **(909) 274-4450**

Mt. SAC offers a variety of financial aid programs funded by federal and state agencies and private sources, including grants, fee waivers, work-study opportunities, scholarships, and loans.

Step 3 **Complete the assessment process** **(909) 274-4265**

All Mt. SAC students are required to participate in assessment for course placement. The assessment and placement process has been established to enable all students the opportunity to be successful in their coursework.

Step 4 **Attend new student orientation** **(909) 274-4380**

Online orientation is required by all new students to MT SAC. To access the online orientation, go to your [Mt. SAC Portal](#) and click the “Student Success” tab.

Step 5 **Get counseling** **(909) 274-4380**

Before registering for classes, every Mt. San Antonio College student should have a first-semester course plan, aka, Mountie Academic Plan (MAP).

Step 6 **Register for classes** **my.mtsac.edu**

Check your registration date and time by using your [Mt. SAC Portal](#) under the “Student” tab. You may register for classes on or after your assigned date and time.

Step 7 **Pay fees** **(909) 274-4960**

You can pay fees online with a credit card (in your [Mt. SAC Portal](#)) or in person at the Cashier's Office Building 4).



Adding & dropping classes

Adding an open class.

You may add open classes online via the [Mt. SAC portal](#). Verify your add by printing your schedule/receipt.

Adding a closed or full class.

If the class is full at the time of registration, a limited number of students can place themselves on a wait list. This list allows a student to potentially add the course at a later date (if a space becomes available). Getting on a wait list does not enroll the students in a class. If a space becomes available, the student will be notified via their campus email address and their student portal. The student will then have about 72 hours from their initial email notification to add themselves to the course. Failure to add themselves on time will result in removal from the wait list. If a student makes it to the wait list but is not offered a seat in the class, the wait list is used to establish a priority for adding the class. In this case, students must attend the first class meeting, obtain an “add authorization code” from the instructor, and process the add authorization code via their [Mt. SAC portal](#) prior to the codes expiration date.

Dropping a class.

A student must drop the class online <https://inside.mtsac.edu>. It is the student’s responsibility to make sure classes are dropped according to established deadlines in order to potentially avoid fees and/or negative grades.

Air Conditioning & Refrigeration Program & Course Description

The program is designed to prepare students for employment in the broad field of air conditioning, heating, and refrigeration. It leads to occupations in service, installation, maintenance, design, operations, sales, or distribution. For students interested in a work-based learning experience, a work-study component is also offered in addition to regular classes.

Program Guidelines

The Air Conditioning and Refrigeration Program consists of 10 courses with 31.5 units that are required for a certificate or degree (along with General Education requirements for the Degree). The program has day and evening offerings designed to accommodate the needs of students.

AIRC 10 **2 Units** **Technical Mathematics in Air Conditioning and refrigeration**

Develops mathematical skills required for the study and application of air conditioning and refrigeration including measurements and equations applied to heat loads, air distribution, electricity, and the design of air conditioning and refrigeration equipment.

AIRC 12 **3 Units** **Air Conditioning Codes and Standards**

Building codes and standards as they apply to the air conditioning industry. Develops skills necessary to read and interpret building codes and resolve installation and service problems as they apply to the construction industry.

AIRC 25 **5 Units** **Electrical Fundamentals for Air Conditioning and Refrigeration**

Electrical principles and practices used in air conditioning and refrigeration as applied to the development and interpretation of schematics and the sequential approach to wiring circuits including power supplies, motors, and controls. Schematics include heat pumps. Develop skills for designing electrical circuits and electrical troubleshooting.

AIRC 30 **4 Units** **Heat Load Calculations & Design**

Heat loss and heat gain will be examined, developed and applied to residential dwelling air conditioning systems. Equipment sizing, selection and duct design based on the heat load of a structure. Heat load calculation software will be explored and used to aid in the process. Duct design and sizing included.

AIRC 32A **1.5 Units** **Air Properties and Measurements**

Investigates the airside operating theory and application of comfort cooling systems. The course will broaden the student's understanding of air conditioning systems by addressing psychometrics to include the measurement of dry bulb and wet bulb temperatures and relative humidity.

AIRC 11 **2 Units** **Welding for Air Conditioning and Refrigeration**

Fundamentals of welding related to the field of air conditioning and refrigeration. Emphasis is on sterile techniques and skills required for joining copper refrigerant lines and procedures for light fabrication,

AIRC 20 **4 Units** **Refrigeration Fundamentals**

Principles of mechanical refrigeration based on the refrigeration cycle and associated mechanical components. Develops skills for interpreting service gauge pressures and sensible temperatures, system dehydration techniques, and the safe handling and containment of refrigerants. Heat pump principles included.

AIRC 26 **2 Units** **Gas Heating Fundamentals**

Theory, operation, and application of natural gas and propane heating systems used in residential and light commercial heating installations including the properties of fuel gases, gas combustion, furnace construction, pilot proving devices and ignition systems.

AIRC 31 **4 Units** **Commercial Electrical for Air Conditioning and Refrigeration**

Electrical control of commercial air conditioning and refrigeration equipment emphasizing time clocks, defrost, three phase transformers, three phase motors, time sequencers, starting methods and troubleshooting of three phase systems.

AIRC 34 **4 Units** **Commercial Systems**

This course is designed for the advanced student to gain familiarity with commercial systems, which are not limited to air handlers, cooling towers, water pumps, chillers, and thermal storage. Students will also increase their understanding of how large complex buildings are to be conditioned.

Air Conditioning & Refrigeration Program Daytime Track

Daytime classes (full time) allow a student to finish in as little as a year following the recommended tracks listed below, some in the morning and some in the afternoon.

Fall

Fall Semester

AIRC 11

Electrical Fundamentals
for Air Conditioning &
Refrigeration

AIRC 20

Refrigeration
Fundamentals

AIRC 25

Electrical Fundamentals
for Air Conditioning &
Refrigeration

Winter Intersession

AIRC 10

Technical Mathematics for
Air Conditioning &
Refrigeration

AIRC 26

Gas Heating Fundamentals

Spring Semester

AIRC 30

Heat Load Calculations

AIRC 31

Commercial Electrical for
Air Conditioning &
Refrigeration

AIRC 34

Commercial Systems

Summer Intersession

AIRC 12

Air Conditioning Codes
and Standards

AIRC 32A

Air Properties and
Measurement

Spring

Spring Semester

AIRC 11

Electrical Fundamentals
for Air Conditioning &
Refrigeration

AIRC 20

Refrigeration
Fundamentals

AIRC 25

Electrical Fundamentals
for Air Conditioning &
Refrigeration

Summer Intersession

AIRC 10

Technical Mathematics for
Air Conditioning &
Refrigeration

AIRC 26

Gas Heating Fundamentals

Fall Semester

AIRC 30

Heat Load Calculations

AIRC 31

Commercial Electrical for
Air Conditioning &
Refrigeration

AIRC 34

Commercial Systems

Winter Intersession

AIRC 12

Air Conditioning Codes
and Standards

AIRC 32A

Air Properties and
Measurement

Air Conditioning & Refrigeration Program Evening Track

Evening classes allow a student to complete the program in as little as 2 years; however, due to workload of most evening students, expectations to complete the program may extend to 2 ½ to 3 years. Courses are recommended in this order, but advanced courses can be taken as schedules permit. The guide can be used for fall or spring starting semesters.

First Year

Fall Semester

AIRC 20

Refrigeration Fundamentals

AIRC 10

Technical Mathematics for Air
Conditioning & Refrigeration

Note: Either AIRC 20 or
AIRC 25 should be
taken as entry-level
courses. If AIRC 20 is
taken this semester
then AIRC 25 should be
taken next semester
and vice versa.

Winter Intersession

AIRC 12

Air Conditioning Codes and
Standards

Spring Semester

AIRC 25

Electrical Fundamentals for
Air Conditioning &
Refrigeration

AIRC 11

Welding for Air Conditioning
and Refrigeration

Note: Either AIRC 20 or
AIRC 25 should be
taken as entry-level
courses. If AIRC 20 is
taken this semester
then AIRC 25 should be
taken next semester
and vice versa.

Second Year

Fall Semester

AIRC 31

Commercial Electrical for
Air Conditioning &
Refrigeration

AIRC 30

Heat Load Calculations

Winter Intersession

AIRC 26

Gas Heating Fundamentals

Spring Semester

AIRC 34

Commercial Systems

AIRC 32A

Air Properties and
Measurement

“Start by doing what’s necessary; then do what’s possible; and suddenly you are doing the impossible.”

Building Automation Systems Program & Course Description

Building automation is defined as a programmed, computerized network of electronic devices that monitor and control the energy consumption of buildings. The intent is to create an intelligent building and reduce energy and maintenance costs. In commercial buildings, most fire-life-safety, lighting, air conditioning, and ventilation systems are automated to manage energy consumption. There is a strong and sustainable demand for building automation service (BAS) technicians that will continue, as energy remains a limited commodity.

Program Guidelines

The building automation systems program consists of 8 courses with 33 units that are required for a certificate or degree (along with general education requirements for the degree).

AIRC 20 **4 Units**
Refrigeration Fundamentals
Principles of mechanical refrigeration based on the refrigeration cycle and associated mechanical components. Develops skills for interpreting service gauge pressures and sensible temperatures, system dehydration techniques, and the safe handling and containment of refrigerants. Heat pump principles included.

AIRC 31 **4 Units**
Commercial Electrical for Air Conditioning and Refrigeration
Electrical control of commercial air conditioning and refrigeration equipment emphasizing time clocks, defrost, three phase transformers, three phase motors, time sequencers, starting methods and troubleshooting of three phase systems.

AIRC 61 **4 Units**
Building Automation Fundamentals
Basics of commercial heating, ventilation, and air conditioning (HVAC) control theory as it applies to control systems. Building automation systems (BAS) controller wiring for power, communication, inputs, and outputs. Navigating the computer operating system environment, BAS software, and applications. Word processing, spreadsheets, and flow-charts for use with BAS systems.

AIRC 67 **4 Units**
Energy Management
Principles and practical applications for energy cost reduction and strategies. Emphasis on the use of building automation systems to achieve control over energy costs. Includes theory for sustainable Green Building Technologies with introduction to Energy Star buildings and Leadership in Energy and Environmental Design (LEED) programs.

AIRC 25 **5 Units**
Electrical Fundamentals for Air Conditioning and Refrigeration
Electrical principles and practices used in air conditioning and refrigeration as applied to the development and interpretation of schematics and the sequential approach to wiring circuits including power supplies, motors, and controls. Schematics include heat pumps. Develop skills for designing electrical circuits and electrical troubleshooting.

AIRC 34 **4 Units**
Commercial Systems
This course is designed for the advanced student to gain familiarity with commercial systems, which are not limited to air handlers, cooling towers, water pumps, chillers, and thermal storage. Students will also increase their understanding of how large complex buildings are to be conditioned.

AIRC 65 **4 Units**
Building Automation Networks and Programming
Programming heating, ventilation, and air conditioning (HVAC) direct digital controllers using line (text) programming, icon based programming, and block programming. Stresses good programming practices including complete program documentation.

CNET 56 **4 Units**
Computer Networks
Standards, terminology, design, implementation, and troubleshooting techniques as they relate to both local and wide area networks. Emphasis on hardware and software components, network architecture, and data transmission methods. Of special interest to computer and network technicians and those seeking certification in A+, Network+, or other certifications

Building Automation Systems Program Track

The Building Automation can be achieved as a stand-alone certificate/degree or as a compliment to the Air Conditioning certificate/degree. The fundamental courses of AIRC 20 and 25 can be interchanged between the spring and fall semesters.

Spring Semester (year 1)

AIRC 20

Refrigeration Fundamentals

AIRC 25

Electrical Fundamentals for
Air Conditioning &
Refrigeration

Winter Intersession

AIRC 67

Energy Management

Fall Semester

AIRC 31

Commercial Electrical for Air
Conditioning & Refrigeration

AIRC 34

Commercial Systems

Spring Semester (year 2)

AIRC 61

Building Automation
Fundamentals

CNET 56

Computer Networks

Winter Intersession

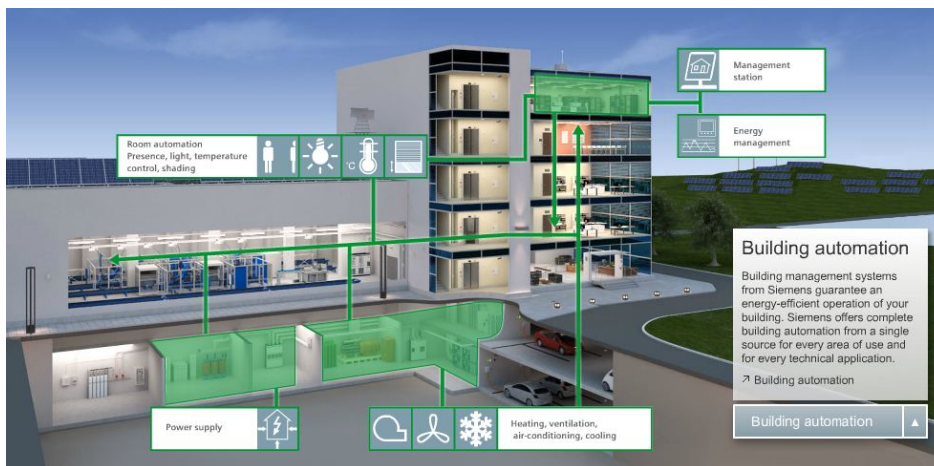
AIRC 67

Energy Management

Spring Semester

AIRC 65

Building Automation
Networks and
Programming





TOOLS

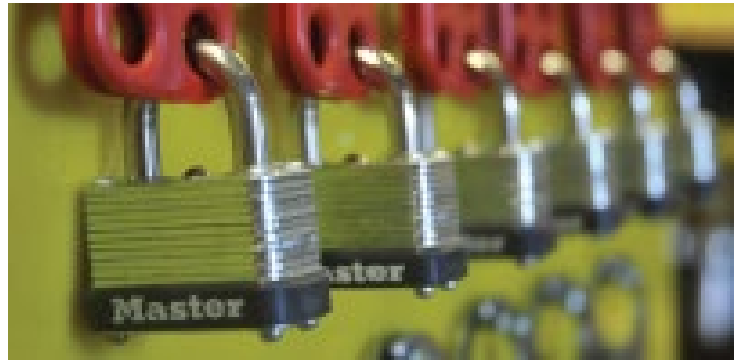
The Air Conditioning department uses a tool chip check-out system. Once a student completes a Tool Check Voucher, they are assigned 10 identically numbered tool chips. The tool chips will then enable students to check out tools, supplies, etc. from the tool room as needed for classroom assignments at no cost to the student. When they complete the program, students are to return all tool chips. The tool crib inventory is adequate to handle all lab project needs.

Safety

Mt. SAC is committed to a safe and secure college learning environment. The first concern in establishing and implementing emergency procedures is the welfare of the college students and personnel. As a result of this concern, Mt. SAC established a campus safety emergency plan meeting all Government Code Sections 3100—3101 for the State of California. The procedures are posted in each building and made available to students.

Dress Code

The dress code for students in the HVAC courses is based on safety. Students are required to wear closed-toed shoes, safety glasses in all labs, and gloves any time they are handling refrigerants. Students are not allowed to wear loose clothing any time they are participating in lab projects. Dress codes are documented in the syllabus of each course. Students are responsible for their own safety equipment.



Facilities

We have one of the most extensive refrigeration training programs in Southern California. Our facility contains four classrooms, an electrical classroom/lab, a utility classroom, a computer classroom for advanced courses, and a dedicated mechanical lab with a diverse selection of refrigeration and air conditioning equipment. Most of our courses are lecture and demonstrations with related lab exercises. To arrange a tour of the Air Conditioning and Refrigeration and Building Automation facilities, contact the Department Chair for an appointment.



Air Conditioning Advisory Committee

Absorber Consulting
 Air Control Systems
 Alliance Industrial Refrigeration Services
 Carrier Commercial Services
 Emcor
 Trane Commercial Services
 Trane Engineering

Building Automation Advisory Committee

Advanced Automated Solutions
 CalWest Controls
 ControlWorks
 Inland Mechanical Services
 Schneider Electric
 Siemens
 Sothern California Trane
 Sunbelt Controls

Advisory & Accreditation

All courses and certificates are continually reviewed and approved by industry practitioners. Advisory Committees meet at least two times a year to ensure that the program remains current with industry and student needs.

The Air Conditioning program has undergone a voluntary third party accrediting body to improve the technical competency of the heating, ventilation, air conditioning, refrigeration (HVACR) industry through validation of the technical education process.



Student Learning Outcomes & Course Outline of Record

Course outline of records are available at <https://webcms.mtsac.edu/search.asp>.

Simply select the subject; i.e. AIRC and then the course number.

Student Learning Outcomes are available at <https://www.mtsac.edu/airconditioning/slo/>



Frequently Asked Questions

What is the Building Automation Systems Program (BAS Program)?

Building automation is defined as a programmed, computerized network of electronic devices that monitor and control the energy consumption of buildings. The intent is to create an intelligent building and reduce energy and maintenance costs. In commercial buildings, most fire-life-safety, lighting, air conditioning, and ventilation systems are automated to manage energy consumption. This has created a strong and sustainable demand for Building Automation Service (BAS) technicians that will continue as long as energy remains a limited commodity.

How is the Air Conditioning & Refrigeration Program structured?

The Program is structured for students that may or may not have a background in air conditioning or refrigeration. The course numbers reflect a progression of classes students may follow. For example, beginning or entry level courses start with the 10 series and 20 series up to AIRC 25, while advanced courses are AIRC 26 and higher.

Most courses feature lecture and lab components that require students to complete hands-on lab assignments for completion. Labs include electrical schematic drawings and circuit construction, mechanical labs where students work on operating equipment, manipulate refrigerants and obtain vital signs from the machines, pneumatics labs, and a computer lab where students will design duct systems, calculate heat loads and program a building automation simulation with mockup variable air volume duct systems.

The college uses a Fall and Spring 16-week semester format, with 6-week Winter and Summer Intersessions between the semesters. Consult session schedules for offerings or on the www.mtsac.edu website.

How is the Building Automation Systems program structured?

The program is structured for students to build on their air conditioning knowledge and experience. Air conditioning courses are offered as part of the certificate/degree to allow students to achieve this background. The course numbers reflect a progression of classes a student may follow. For example, beginning entry level courses start with AIRC 20 and AIRC 25 while the advanced courses are AIRC 31 and higher.

Most courses feature lecture and lab components that require students to complete hands-on lab assignments. Labs include electrical circuit design and construction, mechanical design and operation, network strategy and integration, control system development and implementation, programming, and energy management. Students perform practical tasks on electrical and mechanical equipment, and various energy management controls.

Frequently Asked Questions (continued)

What classes does a student complete at Mt. SAC for the BAS Certificate?

Students complete the following classes at Mt. SAC: AIRC 20, AIRC 25, AIRC 31, AIRC 34, AIRC 61, AIRC 65, AIRC 67, CNET 56.

What courses should I take first if I decide to start the BAS Program?

The courses for the BAS Program are structured in a numerical order. The entry-level AIRC courses are AIRC 20 and AIRC 25. Students may register for any of these courses to enter the Program. AIRC 31 through AIRC 67 are considered advanced level courses and recommended advisory prerequisite entry-level courses should be completed first.

What courses should I take first for the Air Conditioning & Refrigeration Program?

The Air Conditioning and Refrigeration Program is structured in a numerical order. The entry-level AIRC courses are AIRC 10 through AIRC 25. Students may register for any of these courses to enter the program. AIRC 26 through AIRC 34 are considered advanced level courses and recommended advisory prerequisite entry-level courses should be completed first.

Are there any prerequisites required to enter the AIRC Program?

Students should have good math and reading skills along with mechanical abilities. Math skills should be at a basic Algebra level. AIRC10 will teach those skills and individual help is available to bring math skills up to the required level. Reading skills needed are for textbook and assignment reading and comprehension including reading of instructions required for homework and lab assignments. Mechanical skills can be developed and good reasoning skills are needed. The refrigeration technician will need mechanical, reasoning, math and reading skills to succeed.

Do I need a high school diploma or GED to start the program?

Students entering the Air Conditioning and Refrigeration Program do not need a high school diploma or GED. This vocational program leads to employment in the air conditioning and refrigeration industry. However, occupational research shows that the more education a technician has, the higher their earnings potential. There are specific skill levels for reading and math that are required for entry-level employment in addition to the ability to communicate clearly with customers and work associates. Mt. SAC has supplemental education programs to help obtain these required skills. Individual help is available through the Learning Assistance Center (LAC) and Adult Basic Education (ABE). Consult the Instructor if additional skills or help is needed.

Frequently Asked Questions (continued)

What is the job outlook for the Air Conditioning, Refrigeration and Building Automation Industries?

The State of California is predicting a need for at least 38,700 new technicians by the year 2024. The industry will need more technicians due to the large amount of baby boomers that will be retiring in the next 5-10 years. Due to energy demands and environmental changes, technicians are faced with an increasing workload. The growth pattern for this industry has not stopped for decades and will only increase in the near future. Building automation is a relatively new field that has just begun to require a demand for technicians and will only increase in numbers due to energy issues and equipment development utilizing energy management systems. The industry will be experience a shortage of technicians in the near future that will allow opportunities for students with strong work habits, consistent academic performance, and solid technical skills.

What does an Air Conditioning or Refrigeration technician's job include?

Air conditioning or refrigeration technicians often travel to job sites in new construction and service applications to install, maintain service or repair equipment. Many technicians work in the residential and small commercial applications while others work in large commercial or industrial occupations. Numerous stationary positions exist in hospitals, manufacturing plants, and high-rise buildings. A clean driving record is critical since technicians are often assigned a company vehicle. Reliable technicians with good technical skills will work many hours of overtime in hotter months. In the instance of repairing a unit that is down in an office environment or supermarket, The system must be fixed immediately and the technician must stay at the job site until the system is up and running again. Air conditioning and refrigeration is required for all aspects of our lives including grocery stores, office buildings, hospitals, schools, homes, stores, and just about all buildings. It also includes refrigeration of warehouses for food and the freezing of food and other applications.

How much can I earn as a technician in these occupations?

The pay rate for air conditioning and refrigeration technicians is based on merit. The more reliable a technician and the more responsibility they take on, the higher their pay rate. Currently, entry-level technician earn from \$10 - \$18 per hour. Entry-level technicians must know that experience pays and Increased skill levels, education, and responsibility will allow their income to increase quickly. Experienced technicians can make as much as \$30 per hour or more plus overtime and benefits. Larger companies tend to pay more with more benefits than smaller companies do. Pay and benefits vary among companies. Technicians working in the field can make \$60,000 or more per year or more depending on overtime.

Frequently Asked Questions (continued)

Do I have to take all the courses before I can work in the industry?

No. Recommendations are that students complete about half of the courses in the Program before seeking employment. The entry-level courses will lay a foundation for application in employment in the industry. Employers recommend students continue in school to complete the Program, which leads to greater success. Many contractors and employers send their students to the Program and will often pay for expenses upon successful completion of a course or the entire Program.

Does the program offer job placement?

Mt. SAC has a job opportunity program that includes jobs in the field. The Program also lists job opportunities as contractors and/or employers call and request candidates. Those opportunities are posted on a board in the lab. The AIRC 34 course includes a project to develop a good resume to help students find employment working with experienced resume writers from the College.

Are there any certifications required to work in the refrigeration industry?

Currently, there are no requirements or certifications required to work in the air conditioning and refrigeration industry. A Certificate from the Mt. SAC Air Conditioning and Refrigeration Program is respected within the industry and helps to further a career. Staff recommends students complete the Program to obtain a Certificate and work in the industry and then return to the College to work on an Associate Degree in Air Conditioning and Refrigeration.

An EPA or Environmental Protection Agency Type 608 Certification is required to handle refrigerants. The Certification allows technicians to purchase, handle and manipulate refrigerants per the Federal Clean Air Act. The Program offers the test at least twice a year for a modest fee. It is not a part of the curriculum. It is a federal offense to work with refrigerants without a Certification except when working with refrigerants in the College Program.

What credentials can I obtain by taking the Program?

A Certificate from the Air Conditioning and Refrigeration Program at Mt. SAC is widely recognized in Southern California. The Program is the only PAHRA (Partnership for Air Conditioning, Heating, and Refrigeration Accreditation) program in California. It will help in seeking employment and for advancement in a job.

An Associate Degree in Air Conditioning and Refrigeration leads to management and supervisory positions within the industry. Contractors and employers recognize the extra efforts technicians make when completing a degree. Those credentials usually lead to added responsibilities such as lead persons, supervisors or managers.

A Bachelor Degree is available in Air Conditioning and Refrigeration from Ferris University in Big Rapids, Michigan. The program is available on line and requires an Associate Degree as an entry-level requirement. This Program usually leads to engineering and design jobs within the industry.

Frequently Asked Questions (continued)

Are all classes offered each semester?

No. AIRC 20 and AIRC 25 are the only courses offered each semester. Most other courses are offered once a year in either the Fall or Spring semesters, or the Winter Intersession. Summer courses are sometimes offered.

Can I visit the facilities before I enroll?

Yes. Use the contact information on the course description handout or from the program information sheet to find the phone numbers of the faculty and staff. All faculty and staff will be glad to set up a time and date to give a tour and answer questions. Staff work every workday from 6:30 am to 3:30 pm and are usually at the facility. Faculty is usually on campus in the mornings or evenings during the semesters and during office hours. During the Intersessions faculty will only be on campus for the courses they teach and their office hours.

Disclaimer

Information provided on this document is accurate at this time and may change. The website is not automatically updated when circumstances change and therefore the information provided was accurate at the time of printing. If any other questions arise, contact staff or faculty for current information.

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