



Student Handbook 2018-2020

Heating, Ventilation, Air Conditioning and Refrigeration Student Handbook

Name_____

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General Information

A Message to the Students

Welcome to the Texas Southmost College **Heating, Ventilation, Air Conditioning and Refrigeration Program.** This handbook has been compiled to help familiarize you with the policies utilized by this program as well as available student services.

The Heating, Ventilation, Air Conditioning, and Refrigeration Program Student Handbook pertains to students that have been admitted to that program and is a supplement to the Texas Southmost College Student Handbook. The Vice-President of Instruction and Student Services is the chief administrator for academic/non-academic policies and procedures.

It is through the spirit of cooperation and communication that students and faculty members share a common goal of learning. In this profession, competence is developed through diligence, determination, and patience in the practicum environment as well as the classroom.

The Degree Plan for Heating, Ventilation, Air Conditioning, and Refrigeration has been designed to provide the student with a well-rounded curriculum.

Please remember that you, the student, are the most important asset of this program. Your suggestions are welcomed, appreciated, and may be submitted at any time to the Advisory Committee of this program or directly to the Program Faculty.

Non-Discrimination Statement

Texas Southmost College Heating, Ventilation, Air Conditioning, and Refrigeration Program is non-discriminatory about race, creed, color, sex, age, handicap, and national origin. No otherwise qualified handicapped individual in the United States as defined shall, solely by reason of his handicap be excluded from participation in, be denied benefits of, or be subject to discrimination under any program or activity receiving federal assistance.

Mission of the Institution

The mission of Texas Southmost College (TSC) is to transform our communities through innovative learning opportunities.

Role and Scope

Texas Southmost College's mission is guided by our commitment to provide:

• University transfer, career, and technical programs leading to an associate degree or certificate along with courses specializing in college preparatory and developmental education, workforce

training, adult literacy, and continuing education to support the evolving needs of citizens, industry, and economic development initiatives within Cameron and Willacy Counties.

- High-quality instruction and learning opportunities in the classroom, online, and through other delivery methods; a supportive and innovative faculty and staff; appropriate technology, equipment, and learning resources; and advising and assessment services to promote transfer to a four-year baccalaureate institution, entry or advancement in the workforce, or lifelong learning.
- A learning-centered, service-oriented environment that celebrates diversity and inclusion; facilitates growth and development; fosters social responsibility, critical thinking, communication, and innovation; and empowers and engages students, faculty, and staff to achieve personal and professional goals.
- Institutional effectiveness that embraces individual accountability, data-driven decision-making, change, and an unending pursuit of excellence.

Institutional Accreditation

Texas Southmost College is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award certificate and associate degrees.

Program Information Heating, Ventilation, Air Conditioning and Refrigeration Program Contact Information

Heating, Ventilation, Air Conditioning and Refrigeration Instructors Ruben De La Rosa <u>ruben.delarosa@tsc.edu</u> 956-295-3730

Daniel Garcia Daniel.garcia@tsc.edu 956-295-3553

Administrative Assistant- Career and Technical Education Emilio Rodriguez Jr Emilio.rodriguez@tsc.edu 956-295-3745

Dean of STEM-CTE Division Mr. Murad Abusalim Ph.D. <u>Murab.abusalim@tsc.edu</u> 956-295-3568

Mission of the Program

The mission of the Heating, Ventilation, Air Conditioning, and Cooling program is to prepare students for successful entry in the air conditioning, heating, and refrigeration industry. Students develop skills, knowledge and successful workplace attitudes in installation, service/repair, and maintenance of typical equipment and systems. The HVAC program provides students with classroom and laboratory experiences using the most current technology to perform assigned work and projects.

Program Outcomes (Goals)

Upon completion of the program, all students will be able to:

- **Goal 1** Identify and develop the necessary skills and training relevant to troubleshoot and repair HVAC/R equipment in the HVAC/R industry
- Goal 2 Demonstrate an understanding of the HVAC/R industry and the terminology used
- **Goal 3** Understand and apply safety requirements, identifying tools, industry codes, and equipment used in the HVAC/R industry

Program Description

The Heating, Ventilation, Air Conditioning, and Refrigeration Program is designed by the department working in close collaboration with business and industry to satisfy the need for a timely and effective workforce. The Program offer a Level I Certificate and an AAS degree consisting of coherent sequence of course intended to prepare students for employment. The program provides students with hands-on training experience to prepare for entry into the HVAC industry, with the majority of graduates attain the EPA Refrigerant Recovery and Recycling Program certification and the National Center for Construction Education & Research (NCCER) at the core and level certifications.

Qualifications for Applicants

Admission to TSC is sufficient to be admitted in the Heating, Ventilation, Air Conditioning, and Refrigeration Program. For admission requirements at TSC, Please contact the Admission and Records at TSC for college admission requirements at (956)-295-3600. For information visit the Admission and Records Office website at http://www.tsc.edu/index.php/admissions-and-records.html

Student Work Policy

As in all Career and Technical Education Programs at Texas Southmost College, working full-time while enrolled in a program is difficult and not recommended since work schedules generally conflict with class and or/practicum rotations. Should a student be employed in any facility that is an affiliate of the program, they may do so only during times where it does not involve or conflict with program activities. Additionally, should a student be employed by a facility where practicum rotation is normally conducted, they may not use "employer time" to substitute for program practicum requirements.

Behavioral Conduct

TSC Heating, Ventilation, Air Conditioning, and Refrigeration students representing Texas Southmost College are expected to conduct themselves in such a manner as to reflect favorably upon themselves and the program. Every effort is taken to provide for all students an academic environment that is conductive to academic endeavors, social growth, and individual self-discipline. The College expect students eligible to perform at the College level are familiar with the ordinary rules governing proper conduct and that they will observe these rules as a matter of training and habit (See TSC Student Handbook Discipline Code/Sanctions).

Classroom Conduct

Classroom activities (didactic and laboratory) are an essential part of Heating, Ventilation, Air Conditioning and Refrigeration Program courses. Although instructors strive to establish an informal classroom environment, Students must conduct themselves in a manner that continues to facilitate learning. Students are expected to:

- 1. Come to class prepared for the scheduled subject or activities
- 2. Behave in a manner that does not interrupt classroom or laboratory activities. Examples of disruptive behavior include frequent tardiness, leaving early, private conversations during class, and inappropriate or offensive behavior.
- 3. Ensure that cellular telephones, radios and pagers do not disrupt the classroom or laboratory activities. Students are expected to ensure that the activation of these devices does not disrupt classroom, laboratory, or clinical activities.

Attendance

Students are encouraged to attend 100% of the scheduled class sessions; otherwise, it is the student's responsibility to acquire any missed information and schedule make-ups, where applicable. The Heating, Ventilation, Air Conditioning and Refrigeration Program require students to attend classes punctually and regularly so that the learning objectives of the course may be accomplished. In each semester, the assessment of absences begins the first day of class.

Liability Insurance

All students in the Heating, Ventilation, Air Conditioning, and Refrigeration program are required to have professional liability insurance. This insurance is provided on a group basis and the cost for the professional liability insurance is included in the fees paid in which a practicum course is required.

Grievance Procedure

The intention of the student grievance policy procedure at TSC is to assure the aggrieved student of due process in the disposition of the grievance or complaint. While the procedure will not guarantee the student that the result will be totally satisfactory, the college intends for the procedure to provide sufficient options for resolution of the matter. The procedure for filing a grievance can be found in the official TSC Undergraduate Catalog.

Student Records

As a student at Texas Southmost College, your education record information is protected by FERPA. The Family Educational Rights and Privacy Act (FERPA) of 1974 is a federal law that requires Texas Southmost College to treat your education records in a legally specified manner.

Technical Standards (Essential Functions)

A Heating, Ventilation, Air Conditioning, and Refrigeration student must possess motor and visual skills that would enable him/her to meet program objectives and perform job duties required in the profession. Specifically, the students:

- 1. HVAC Industry requires students to be State registered and EPA certified.
- 2. Have the ability to lift and move at least 50 pounds.

Required Supplies and Materials

Uniform Requirement

All students are required to wear at all times during class and lab the HVAC/R shirt. Student will get the design and color required on the first day of class. Students should exhibit a professional manner in both attire and conduct. NO METAL JEWELRY will be allowed in lab.

Students of the HVAC/R Program will also need the following items:

- Item Description
- 1. Refrigeration Ratchet
- 2. 8"Adjustable Wrench
- 3. 10"Adjustable Wrench
- 4. Screwdriver: Phillip's #2 with plastic or rubber handle
- 5. Screwdriver: Standard ¼" Slotted blade plastic or rubber handle
- 6. 8" Needle Nose Pliers with insulation
- 7. Wire Strippers
- 8. Safety Glasses with side shields OSHA approved
- 9. 10" Slip joint pliers
- 10. Claw Hammer
- 11. Refrigeration manifold gauges for R-22, R-134a & 410a manifold & 404a gauges
- 12. Refrigerate check valve or hose with valve
- 13. Digital pocket thermometer
- 14. Welder's striker
- 15. Flaring kit with block, tool
- 16. Tubing cutter with reamer
- 17. Small Tubing cutter (IMP)
- 18. Inspection mirror
- 19. Swaging tool with different sizes ¼", 3/8, ½"
- 20. Tool box or bag or back pack
- 21. 25 or 30 X 1" foot measuring tape
- 22. 8" or 10" High-Leverage Side-cutting pliers (linesman pliers) insulated
- 23. Red handle nut drivers ¼ X 7"
- 24. Yellow handle nut drivers 5/16" X 7"
- 25. Outer Reamer or small pocket knife

- 26. Duct Knife
- 27. 8" Diagonal-Cutting Pliers angle head
- 28. ¼ X 5/16 X 3/8 tube bender
- 29. Heavy Duty Flashlight
- 30. Hex Tool for opening & closing valves for centrals A/C
- 31. Leather working gloves
- 32. Fieldpiece (SC440)
- 33. Leather boots or shoes
- 35. Torpedo level
- 36. Refrigeration valve core removal tool
- 37. Standard large wire brush
- 38. Set of hex wrenches

Classrooms/Lab

Heating, Ventilation, Air Conditioning, and Refrigeration Program Lecture and Lab courses are taught at the HVAC lab and classroom at ITEC campus. The lab is located at the ITEC, room C-406. Specific courses schedules are published in the TSC course schedule per semester.

Curriculum and Course Description

Certificate of Proficiency - Level One (CERT1. HART 2018-2019)

Heating, Ventilation, Air Conditioning and Refrigeration Certificate of Proficiency - Level One

Texas Southmost College Division of Science, Technology, Engineering & Mathematics/ Career & Technical Education

The mission of the Heating, Ventilation and Air Conditioning Technology program is to prepare students for successful entry in the air conditioning, heating and refrigeration industry. Students develop skills, knowledge and successful workplace attitudes in installation, service/repair and maintenance of typical equipment and systems. The HART Technology program provides students with classroom and laboratory experiences using the most current technology to perform assigned work and projects.

FIRST YEAR – FALL SEMESTER	CREDIT HOURS
HART 1300 HVAC Duct Fabrication.	
HART 1301 Basic Electricity for HVAC	
HART 1307 Refrigeration Principles	
HART 1310 HVAC Shop Practices and Tools	

FIRST YEAR - SPRING SEMESTER

HART 1341 Residential Air Conditioning	
HART 1303 Air Conditioning Control Principles	
MAIR 1349 Refrigerators, Freezers, Window Air Conditioners	
HART 1356 EPA Recovery Certification Preparation	

TOTAL CREDIT HOURS FOR GRADUATION - 24

A minimum grade of "C" must be obtained in each (HART, MAIR) course required in the degree plan.

Associate of Applied Science (AAS.HVAC 2018-2019)

Heating, Ventilation, Air Conditioning, and Refrigeration Associate of Applied Science

Texas Southmost College Division of Science, Technology, Engineering & Mathematics/ Career & Technical Education

The mission of the Heating, Ventilation, Air Conditioning and Refrigeration (HVAC) program is to prepare students for the successful entry in the air conditioning, heating and refrigeration industry. Students develop skills, knowledge and successful workplace attitudes in installation, service/repair and maintenance of typical equipment and systems. The HVAC Technology program provides students with classroom and laboratory experiences using the most current technology to perform assigned work and projects.

FIRST YEAR - FALL SEMESTER CREDIT HOURS HART 1300⁺ HVAC Duct Fabrication 3 HART 1301⁺ Basic Electricity for HVAC 3

HART 1301' Basic Electricity for HVAC	3
HART 1307 ⁺ Refrigeration Principles	3
HART 1310 ⁺ HVAC Shop Practices and Tools	
XXXX X3XX ² Social and Behavior Sciences Elective	

FIRST YEAR - SPRING SEMESTER

HART 1341 ⁺ Residential Air Conditioning	3
HART 1303 ⁺ Air Conditioning Control Principles	
MAIR 1349 ⁺ Refrigerators, Freezers, Window Air Conditioners	
HART 1356 ⁺ EPA Recovery Certification Preparation	
ENGL 1301 ⁺ Composition I	

SECOND YEAR - FALL SEMESTER

HART 1345 ⁺ Gas and Electric Heating	3
HART 2338 ⁺ Air Conditioning Installation and Startup	
HART 2301 ⁺ Air Conditioning and Refrigeration Codes	
SPCH 1315 Public Speaking OR	
SPCH 1318 Interpersonal Communication	3
MATH 1332 ⁺ Contemporary Mathematics	

SECOND YEAR - SPRING SEMESTER

HART 2342 ⁺ Commerical Refrigeration	3
HART 2345 ⁺ Residential Air Conditioning Systems Design	3
HART 2388 ⁺ Internship – Heating, Air Conditioning, Ventilation and Refrigeration Maintenance	
Technology/Technician	3
HART 2349 ⁺ Heat Pumps	3
XXXX X3XX ¹ Language, Philosophy & Culture/Creative Arts Elective	

TOTAL CREDIT HOURS FOR GRADUATION - 60

⁺Grade of "C" or better is required for graduation.

¹Language, Philosophy & Culture/Creative Arts Electives: Any General Education Core course that meets these categories.

² Social and Behavioral Sciences Elective: Any General Education Core course that meets this category.

A minimum grade of "C" must be obtained in each (HART, MAIR) course required in the degree plan.

Course Description

HART-1300 - HVAC Duct Fabrication

Layout and fabrication of HVAC duct systems using common tools and equipment of the trade. Lec 2, Lab 4, Cr 3

HART-1301 - Basic Electricity for HVAC

This course covers principles of electricity as required by HVAC equipment including proper use of test equipment, electrical circuits, and component theory and operation. Lec 2, Lab 4, Cr 3

HART-1301 - Basic Electricity for HVAC

This course covers principles of electricity as required by HVAC equipment including proper use of test equipment, electrical circuits, and component theory and operation. Lec 2, Lab 4, Cr 3 HART-1307 - Refrigeration Principles

An introduction to the refrigeration cycle, heat transfer theory, temperature/pressure relationship, refrigerant handling, refrigeration components and safety are covered in this course. Lec 2, Lab 4, Cr 3

HART-1310 - HVAC Shop Practices and Tools

Tools and instruments used in the HVAC industry. Includes proper application, use and care of these tools, and tubing and piping practices. Lec 2, Lab 4, Cr 3

HART-1341 - Residential Air Conditioning

A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems are course components. Lec 2, Lab 4, Cr 3

HART-1345 - Gas and Electric Heating

Study of the procedures and principles used in servicing heating systems including gas fired furnaces and electric heating systems. Prerequisites: HART 1301, HART 1307, HART 1303, HART 1341, MAIR 1349. Lec 2, Lab 3, Cr 3

HART-1356 - EPA Recovery Certification Preparation

Certification training for HVAC refrigerant recovery, recycle, and reclaim. Instruction will provide a review of EPA guidelines for refrigerant recovery and recycling during the installation, service, and repair of all HVAC and refrigeration systems. Prerequisites: HART 1300, HART 1301, HART 1307, HART 1310. Lec 3, Cr 3

HART-1391 - Special Topics in Heating, Air Conditioning and Refrigeration

Topics address recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student. This course was designed to be repeated multiple times to improve student proficiency.

Prerequisites: HART 1345, HART 2345, HART 2338, HART 2349, HART 2301. Lec 2, Lab 4, Cr 3

HART-1394 - Special Topics in Heating, Air Conditioning and Refrigeration Mechanic and Repair

Topics address recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student. This course was designed to be repeated multiple times to improve student proficiency. Prerequisites: HART 1345, HART 2345, HART 2338, HART 2349, HART 2301. Lec 2, Lab 4, Cr 3 HART-2301 - Air Conditioning and Refrigeration Codes

HVAC standards and concepts with emphasis in the understanding, and documentation of the codes and regulations required for the state mechanical contractors license and local codes will be covered. Prerequisites: HART 1301, HART 1307, HART 1303, HART 1341, MAIR 1349. Lec 3, Cr 3

HART-2336 - Air Conditioning Troubleshooting

This is an advanced course in application of troubleshooting principles and use of test instruments to diagnose air conditioning and refrigeration components and system problems including conducting performance tests. Prerequisites: HART 1345, HART 2345, HART 2338, HART 2349, HART 2301. Lec 2, Lab 4, Cr 3

HART-2338 - Air Conditioning Installation and Setup

A study of air conditioning system installation, refrigerant piping, condensate disposal, and air cleaning equipment with emphasis on startup and performance testing. Prerequisites: HART 1301, HART 1307, HART 1303, HART 1341, MAIR 1349. Lec 2, Lab 4, Cr 3

HART-2342 - Commercial Refrigeration

Theory and practical application in the maintenance of commercial refrigeration; medium and low temperature applications and ice machines used in the HVAC industry. Prerequisites: HART 1345, HART 2338, HART 2301, and HART 1356. Lec 2, Lab 4, Cr 3

HART-2345 - Residential Air Conditioning Systems and Design

This course is a study of the properties of air and results of cooling, heating, humidifying or dehumidifying. Heat gain and heat loss calculations including equipment selection and balancing the air system are also topics. Prerequisites: HART 1301, HART 1307, HART 1303, HART 1341, MAIR 1349. Lec 2, Lab 3, Cr 3

HART-2349 - Heat Pumps

A study of heat pumps, heat pump control circuits, defrost controls, auxiliary heat, air flow, and other topics related to heat pump systems. Prerequisites: HART 1345, HART 2338, HART 2301, HART 1356. Lec 2, Lab 2, Cr 3

HART-2388 - Internship - Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician

A work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. A learning plan is developed by the college and the employer. Internship 12, Cr 3

Course Competencies

After completing the Air Conditioning & Refrigeration Technology Program, the students will be successful in the following competencies.

- Basic shop safety and maintenance
- Proper usage of hand and power tools
- Housekeeping
- Basic electricity, symbols, schematics
- Different types of Refrigerants
- Charging gauges, cylinders
- Proper usage of VOM testing meters
- Test motors, electrical components, compressors
- Recovery units, vacuum pumps
- Proper procedures for recovering, charging
- Environmental Protection Agency (EPA) Law
- Repairing refrigerants leaks on system
- Diagnose electrical components
- Different copper fittings
- Brazing copper lines
- Troubleshoot, repair domestic freezer, refrigerator, window a/c
- Troubleshoot, air conditioning system
- Troubleshoot refrigeration system
- Diagnose a/c electric heating system
- Diagnose a/c gas heating system
- Fabricate Duct board
- Install duct system
- Install a/c central

Course Substitution

Course substitutions for supportive requirements may be carried out only if the course to be substituted is equal or superior in content to the course that is required by the Heating, Ventilation, Air Conditioning, and Refrigeration curriculum.

Resources

Counseling Services

The TSC Counseling Office provides mental health and substance abuse services at no cost to currently enrolled students. Contact with TSC Counseling Center is confidential and is not part of your academic record. The TSC Counseling Center operates within professional ethical guidelines and both federal and state laws that protect the privacy of your mental health records and assure the quality of services. The TSC Counseling Office is open 8:00 a.m. to 5:00 p.m., Monday through Friday, except on designated holidays. It is located in the Camille Lightner Building. If you are in crisis after hours, please call the National Suicide Prevention Lifeline 1-800-273-TALK (8255), or 911, or Tropical Texas Center for MHMR at 1-877-289-7199 (open 24 hrs) or text 741-741

Advising

The program coordinator will be the advisor for each student upon admission to provide information about the academic program and to assist in making informed decisions. The program director may be consulted during pre-registration, for adding/dropping a course and withdrawing from the Heating, Ventilation, Air Conditioning and Refrigeration Program. All advising sessions will be documented.

Disability Services

Texas Southmost College would like to help students with disabilities achieve their highest potential in college. Students with disabilities may request assistance through the Student Services Center. Some of the services available include note-taking, taped textbook, registration assistance, diagnostic testing, special test considerations and sign language interpreting. An Adaptive Technology and Testing Service are available for student use. All services are elective and must be requested by the students. To request services, students must contact the Disability Services Office at TSC. It is advisable to make this contact well before or immediately after the semester begins. Proof of disability is required (individual documentation requirements vary depending on the disability). Students bear the responsibility of making their abilities and limitations known to the advisor. Together, the student and the advisor will decide on the appropriate accommodations and decides on a course of action for informing the instructor, if necessary. Students must request services each semester, as needed. You can start by calling the office at 956-295-3587 or email <u>angela.dunn@tsc.edu</u> to make an appointment.

Contact Information:

Angela Marie Dunn, MA, LPC-S Lightner Center 100 C Office: 956-295-3417 Fax: 956-544-9093 angela.dunn@tsc.edu

Student Financial Aid Services

TSC provides financial aid to assist students. The financial assistance for eligible students is available in the form of grants, loans, college work-study, veterans' benefits, and scholarships. The college catalog contains the financial resources available to all students. For more information, please visit http://www.tsc.edu/index.php/financial-aid-office.html

Library Facility

The library is a shared service between Texas Southmost College and The University of Texas at the Rio Grande Valley. For a full list of services provided by the shared service, please visit the http://www.utrgv.edu/library/

Our website provides 24/7 access to thousands of scholarly journals and e-books, all accessible to our students, faculty and staff from any location worldwide. Our physical libraries hold a wide array of print books, DVDs, archives, and more, as well as study rooms – available to be checked out for both group and individual study. Librarians are available to help you with your research in person, via phone, chat, text, or email.

Contact Information Paul Sharpe University Librarian University Library LIBR 2.101 A Email: <u>university.librarian@utrgv.edu</u> Phone: (956) 665-2005 Phone Alt: (956) 882-8221

Learning Labs

The College Preparatory Studies (CPS) Learning Labs provide peer tutoring services and review sessions in Math, Reading, Writing, and other subjects. The tutors, certified by the College Reading and Learning Association (CRLA), have excellent communications skills and broad knowledge of the subjects they tutor. CPS Learning Labs provide the campus community access to tutoring services and open computer labs to support student learning. More information is available at http://www.tsc.edu/index.php/learning-lab.html