Intro to HVACR

TEAC - 1010 401

Course Description

An introductory course explaining the principles of Heating, Air Conditioning, and Refrigeration (HVACR). The basic refrigeration cycle and components will be covered. Elementary electrical concepts, electrical heating systems, and hydronic heating systems will be introduced. Guiding principles for service and installing technicians, i.e., hand-tools, safety, energy conservation, certifications, codes, and permits will be introduced. Careers in HVACR will be explored and trade math skills reviewed.

Course Prerequisites

None

Keys for Success (how to succeed in the course)

This course is structured to allow students to work at their own pace. However, this course must be completed by the end of the semester the course was registered in. While substantial preparation work can be performed outside of the classroom and lab, most of the lab assignments are hands-on and require that students be in attendance for these assignments as well as for most quizzes and all exams. Students are expected to manage their schedules and complete all current (registered) coursework by the end of the current semester. Any course not completed by the end of the semester will receive a failing grade and the student will need to repeat the course before proceeding to other courses in the program.

Classroom and lab hours are Monday through Thursday 8:00AM—2:00PM and 6:00PM—10:00PM. However, if instructors have not had, or do not have, any students in the lab at 8:00PM, at their discretion, they may close the lab for the evening. Therefore, if you will be later than 7:30PM, please communicate with the instructor for that evening. The

classroom and lab are located in room TAB-109 of the Technical Arts Building (TAB) on the Taylorsville campus, 1902 Community Blvd.

Required Text or Materials

Title: • Heating and Cooling Essentials
ISBN: 978-1-63776-460-2
Edition: 5th

Title: Modern Refrigeration and Air Conditioning
ISBN: 979-8-89737-599-8
Edition: 22nd

For more information on textbook accessibility, contact Accessibility & Disability Services at ads@slcc.edu.

Additional Materials

You are required to purchase a personal pair of safety glasses. General safety rated plastic glasses or prescription safety glasses are acceptable. You will also need a scientific calculator. You will also need the following hand tools and meters for the labs:

- Safety glasses or prescription glasses with safety lenses.
- Gloves, cut resistant ANSI A4, similar/equal to these found on Amazon.
- Earbuds or headphones that can plug into a laptop computer.
- USB drive to store and transfer your work
- HVACR Clamp Multi-Meter UEI DL479 or similar available at some supply houses or Amazon.
- 6 in 1 screwdriver (#1 and #2 Phillips screwdrivers, 1/4” and 3/16” slotted screwdrivers, 1/4" and 5/16” nut-drivers).
- Small 1/8” flat-blade screwdriver (control screwdriver) used for installing thermostats and other control devices.
- Hex wrench set, SAE (not metric), long-arm (not folding)
- Adjustable open-end wrench, 6”.

- Adjustable open-end wrench, 8”.
- Two pocket thermometers, UEI PDT650 or similar.
- Magnet (approx. 2”X3/4”X1/2”) or The Old Switcheroo (Google to find source).
- Refrigeration service wrench, Yellow Jacket model 60613 or similar.
- Measuring tape, at least 16’.
- Electrical tape, 1 roll.
- Tubing cutter, Ridgid model 150 or similar.
- Deburring tool, Yellow Jacket model 60163 or similar.
- Jumper wires with alligator clips.
- Electrical tape.
- Tubing cutter, Ridgid model 150 or similar.
- Deburring tool, Yellow Jacket model 60163 or similar.

Grading Scale

Each assignment, quiz, and exam have an assigned point value. The course grade is determined by summing all of the assignments, quizzes, and exams and dividing the sum by the total possible points. A letter grade of A , B, or E (failing) will be assigned according to the percentage of points earned and the following table.

GRADE	RANGE
A	90-100%
B	80-89%
E	Less than 80%

Course Student Learning Outcomes

- Explain the basic principles of air conditioning, heating, refrigeration, and ventilation.
- Explain the basic refrigeration cycle and its four major components.
- Describe the fundamental principles of electricity and basic circuits.
- Identify common hand tools, their use, and care.

- Identify career paths in the air conditioning, heating, and refrigeration trade.

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	Chapter 8 H&C Concept Review	Quiz	22
	Check Your Knowledge H&C Chapter 1	Quiz	11
	Check Your Knowledge MRAC Chapter 2: Safety	Quiz	37
	Check Your Knowledge: Personal Protective Equipment Safety Quiz	Quiz	20
	Check Your Knowledge: Electrical Safety Overview	Quiz	16
	Check Your Knowledge: Electrical Safety Video Quiz	Quiz	20
	Check Your Knowledge: Fall Protection Safety Quiz-	Quiz	20
	Check Your Knowledge: Hand & Power Tool Safety Quiz	Quiz	20

Due Date	Assignment Name	Assignment Type	Points
	Check Your Knowledge: Ladder Safety Quiz	Quiz	25
	Check Your Knowledge: Program Orientation and Course Syllabus Quiz	Quiz	29
	Check Your Knowledge: Safety Orientation Quiz	Quiz	20
	Check Your Knowledge: Tools Review Quiz	Quiz	21
	Extension Ladder Setup and Use	Assignment	5
	Final Safety Exam	Quiz	75
	Intro to HVACR Concept Review	Quiz	15
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Introduction to AC Circuit Wiring and Measuring Voltage Lab	Assignment	5
	Introduction to HVACR	Quiz	14
	Lab 1: Hand Tools	Quiz	24
	Lab 2 Hand Tools--Activity 2-2	Assignment	5

Due Date	Assignment Name	Assignment Type	Points
	Lab 2 Hand Tools--Activity 2-3	Assignment	5
	Lab 2: Tools	Assignment	18
	Lab Activity 4A: Tool Safety	Assignment	5
	Lab Activity 4B: Using a Tape Measure	Assignment	5
	Lab Activity 4C: Measurement, Calculation, and Conversion	Assignment	5
	Lab Activity 4E: Power Tools	Assignment	5
	Lab Activity 8-1: Linear and Angular Measurements	Assignment	5
	Lab Activity 8-2: Calculating Surface Area	Assignment	5
	Lab Activity 8-3: Calculating Volume	Assignment	5
	Lab Activity 8-6: Completing a Work Order/Invoice	Assignment	5
	Lockout/Tagout Safety Video Quiz	Quiz	20

Due Date	Assignment Name	Assignment Type	Points
	Module 1A--Chapter 1 Review Questions: Careers and Certification	Quiz	17
	Module 1B Lab Workbook Assignment	Assignment	5
	Module 2D--Chapter 2 Review Questions: Safety	Quiz	18
	Module 3 Chapter 3 Review Questions: Service Calls	Quiz	10
	Module 4 Chapter 4 Review Questions: Tools and Supplies	Quiz	25
	Module 6 Review Quiz	Quiz	31
	Module 7 Exam: Trade Mathematics	Quiz	32
	Module 7 Review Questions	Quiz	42
	Module 8 Concept Review	Quiz	36
	MRAC Chapter 1 Exam	Quiz	27
	MRAC Chapter 1 Lab Manual Activity 1C	Assignment	5
	MRAC Chapter 2 Lab Manual Activities	Assignment	15
	MRAC Chapter 3 Exam	Quiz	12

Due Date	Assignment Name	Assignment Type	Points
	MRAC Chapter 3 Lab Activity	Assignment	5
	MRAC Chapter 8 Lab Activity 8A: Refrigeration System Line ID	Quiz	10
	Safety Handbook and Training Progress Quiz	Quiz	26
	Safety Handbook Received	Assignment	0
	SAFETY STATEMENT OF ACKNOWLEDGMENT	Assignment	0
	Stepladder Setup and Use	Assignment	5
	Tools Written Exam	Quiz	42

How to Navigate to Canvas

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

For more information, navigate to the Institutional Policies tab on the Institutional Syllabus page.

Learning Support and Tutoring Services

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, visit the Institutional Syllabus page under the Tutoring and Learning Support tab. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

Advising and Counseling Support Services

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, visit the Institutional Syllabus page under the Advising and Counseling Support Services tab. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

Student Academic Calendar

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

SLCC Student Academic Calendar