Salt Lake Technical College
SALT LAKE COMMUNITY COLLEGE

Air Conditioning, Heating, and Refrigeration Program

TEAC 1235 Basic Refrigeration

Course Description:

As a student you will be introduced to the specialty tools used in the HVAC trade and the basic theory of the refrigeration cycle, components, and operation of refrigeration units.

Required Materials:

Textbook: Heating and Cooling Essentials, ISBN: 978-1-63126-059-9, Crawshaw.
Lab Manual: Heating and Cooling Essentials, ISBN: 978-1-69126-063-6, Crawshaw.
You will also need a scientific calculator and a clamp-on multi-meter.

Course Competencies/Objectives:

As a student you will be required to complete the following Competencies:

- Demonstrate the math and measurement skills needed for the HVAC industry.
- Describe the proper use of tools used in the HVAC trade.
- Explain the basic refrigeration theory and characteristics of a refrigeration cycle.
- Demonstrate the operation of the basic components used in a refrigeration system.
- Explain the characteristics and applications of different refrigerant and refrigerant oils.
- Describe the process for refrigerant recovery.
- Demonstrate refrigerant system evacuation, leak detection, and system recharge.

To accomplish these Competencies, you will be working to fulfill these Learning Objectives:

- Calculate volume, length, and area.
- Calculate invoice pricing.
- Convert temperatures between Celsius and Fahrenheit.
- Identify basic and specialized hand tools for HVAC.
- Identify basic and specialized power tools for HVAC.
- Identify basic and specialized test equipment Define the Laws of Thermodynamics, specifically the first and second laws.
- Describe heat transfer.
- Describe the three states of matter and how the change of state effects heat and temperature.
- Define and calculate British Thermal Unit (BTU), specific heat, latent heat, and sensible heat.

- Describe superheated vapor and subcooled liquid.
- Describe temperature and the different temperature scales used to measure it.
- Describe pressure and the difference between absolute and gauge pressure.
- Describe the effect pressure and vacuum have on the boiling point of a liquid.
- Define the Gas Laws.
- Demonstrate the use of pressure-temperature charts in the operation of refrigeration systems.
- Describe the process of the basic refrigeration cycle.
- Describe the basic system components of a basic refrigeration system, their use, and the state of the refrigerant in them.
- Measure pressure and temperature using a manifold gauge set and digital thermometer on abasic refrigerant system.
- Demonstrate how to check for superheat and subcooling in a basic refrigerant system.
- Identify different refrigerants.
- Interpret pressure-temperature (P/T) charts.
- Describe refrigerant applications within specific temperature ranges.
- Distinguish between pure component refrigerants and blends.
- Explain fractionation and temperature glide.
- Identify the proper oils used for pure refrigerants and blends.
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Attendance & Attendance Schedules:

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.

Parking permits are available via the SLCC website. There are some parking spaces with meters.

Grading and Evaluation:

Each assignment, quiz, and exam has 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 is determined using the percentage of points earned and the following grading standard:

Range	Grade		Range	Grade
100% to 94%	A		<84% to 80%	B-
<94% to 90%	A-		<80% to 77%	C+
<90% to 87%	B+		<77% to 74%	C
<87% to 84%	B+		<74% to 0%	E