Salt Lake Technical College
SALT LAKE COMMUNITY COLLEGE

# Air Conditioning, Heating, and Refrigeration Program

## TEAC 1305 Customer Service Soft Skills and Residential HVAC Applications

**Course Description**:

Prepares the student for the skills of handling customers, coworkers, and others in a positive and productive manner. Students will be prepared in the areas of professionalism and nonverbal behavior, communication, and communication strategies. Applies the heating and refrigeration theory and practices that were developed in previous courses to residential heating and air conditioning systems. Heat Pumps and mini split systems will be explored as an alternative way to heat and cool residential homes. Emphasis is on energy efficiency in home HVAC systems by proper load calculations, duct design and system operation. More in depth troubleshooting and brazing skills will be used.

**Required Materials:**

- HVAC Customer Service Handbook, 4th Edition, ISBN 978-0-9897540-8-8, Coscia
- Heating and Cooling Essentials, 4th Edition, Crawshaw, ISBN: 978-1-63126-059-9
- Heating and Cooling Essentials Lab Workbook, 4th Edition, Crawshaw, ISBN: 978-1- 63126-063-6
- System Performance, ESCO, ISBN: 1-930044-31-3,
- Universal R-410A Safety and Training Study Guide, ESCO, ISBN: 1-930044-12-7

Scientific Calculator
Multi-Meter

**Course Competencies/Objectives:**

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

- Demonstrate professionalism through nonverbal behavior while working with customers and coworkers.
- Use professional, courteous communication when interacting with customers.
- Demonstrate professional communication strategies when interacting with customers.
- Explain and demonstrate how psychrometrics can be used to provide the indoor air conditions needed for customer comfort.
- Perform residential heat load loss and gain calculations for accurate HVAC equipment sizing.
- Design residential duct system using heat load calculations to provide accurate HVAC system airflow.

• Explain how residential heat pump and mini-split systems can be sued as alternative systems to heat and cool homes.
• Install and service residential HVAC equipment that will provide efficient system operation.
• Perform residential HVAC system service calls without call-backs

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

• Demonstrate a positive first impression.
• Proactively solve problems with a positive attitude.
• Use professional, courteous behavior when addressing and responding to difficult customers
• Strategically plan how to problem solve customer's complaints.
• Demonstrate the importance of teamwork, business etiquette and manners.
• Communicate clearly, honestly, and accurately with customers.
• Exhibit active listening skills and comprehension of what the customer is saying.
• Use conflict-resolution skills to resolve customer concerns.
• Use professional tone of voice and demeanor when communicating with customers by phone or voice mail.
• Use appropriate word choice and phrasing when serving customers.
• Explain professional mobile device usage.
• Demonstrate communication strategies that build the customer/company relationship.
• Define psychrometric fundamentals and the thermodynamics of air and water vapor.
• Explain the comfort zone and the effect different temperatures and relative humidity have on human comfort.
• Identify what property each line on a psychrometric chart represents.
• Demonstrate how to use a Psychrometer to plot measurements on a psychrometric chart.
• Plot any two measurements and evaluate the data, using a psychrometric chart.
• Explain the principles of heat gain and loss.
• Perform heating and cooling load calculations on residential structures using paper worksheets and software.
• Select HVAC equipment for a residential structure based on heat gain and loss calculations.
• Explain the principles of duct design.
• Design a constant volume rigid duct system layout for a residential single-family structure.
• Calculate duct sizing of layout using heat load calculations.
• Explain the refrigeration cycle used in a heat pump system and how it differs from a conventional residential air conditioner.
• Explain how and where a heat pump system would be used to heat and cool a home.
• Explain how a mini-split system differs from a conventional residential air conditioning system.
• Explain how and where a mini-split system would be used to heat and cool a home.
• Install residential heating and cooling equipment, including natural gas and refrigerant lines.
• Perform a residential HVAC system analysis for operation and efficiency.

- Adjust a residential HVAC system for accurate operation and efficiency.
- Explain why conducting a service call in a timely manner is important.
- Describe how to prevent service call-backs.
- Conduct residential furnace service calls.
- Conduct residential air conditioner service calls.

**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 |