Salt Lake Technical College
SALT LAKE COMMUNITY COLLEGE

Air Conditioning, Heating, and Refrigeration Program

TEAC 1245 Fundamentals of Gas Heating and RMGA Exam Preparation

Course Description:

As a student you will be introduced to the theory and applications of combustion heating systems. Students learn principles of natural gas heating systems and associated mechanical codes and safety; includes COSA carbon monoxide protection. This course will also provide the student the opportunity to prepare for and take the Rocky Mountain Gas Association Certification Exam. This certification is required for technicians who work on gas fired equipment in the State of Utah.

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.
Good Practices for Gas Piping and Appliance Installations: Questar
RMGA Study Guide

Course Competencies/Objectives:

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

- Explain combustion theory and the purpose of a combustion analysis.
- Identify different gas furnace types and explain the sequence of operation.
- Determine the proper sizing of gas piping, flue venting, and combustion air, using international mechanical and gas code books.
- Identify the sources and causes carbon monoxide and how to handle it.
- Explain the functionality of a furnace and its components.
- Troubleshot and service medium and high efficiency furnaces.
- Analyze furnace efficiency.
- Prepare for the exam by reviewing and memorizing the information given and then applying this knowledge to the exam.

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

- Explain the properties of combustion.
- Explain the importance of a combustion analysis.
- Identify the different types and applications of furnace installations.
- Explain the sequence of operation of various furnaces.
- Determine the sizing of piping used for gas fired appliances.
- Determine the size of combustion air openings needed for gas fired appliances.
- Determine the size of the flue for gas pipe venting systems.
- Explain what causes carbon monoxide. [combustion]
- Identify sources that generate carbon monoxide.
- Demonstrate how to check for carbon monoxide.
- Explain how to respond if carbon monoxide is discovered.
- Describe the symptoms of carbon monoxide poisoning.
- Identify the components of a furnace.
- Interpret furnace wiring diagram and control sequence.
- Disassemble, assemble, and rewire components of a furnace.
- Diagnose electrical, gas, and mechanical furnace malfunctions.
- Repair electrical, gas, and mechanical furnace malfunctions.
- Check for efficiency of furnace operation.
- Perform preventative maintenance procedures, such as tune ups and changing filters.
- Perform combustion analysis.
- Measure furnace for proper air flow and temperature rise.
- Perform deration for different elevation installations.
- Clock gas meter for fuel volume to the furnace.
- Demonstrate knowledge of information needed to pass the Properties of Natural Gas section of the exam.
- Demonstrate knowledge of information needed to pass the Gas Piping and Sizing section of the exam.
- Demonstrate knowledge of information needed to pass the Combustion Air section of the exam.
- Demonstrate knowledge of information needed to pass the Venting section of the exam.
- Demonstrate knowledge of information needed to pass the Application of Codes section of the exam.
- Demonstrate knowledge of information needed to pass the Deration section of the exam.

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