AIRC 205
HEATING SYSTEMS
3 Semester Hours

The Community College of Baltimore County

Description

Heating Systems
Studies the construction and operation of gas fired, oil fired and electric forced air heating equipment (and other related systems as time allows); introduces procedures for installing, testing and adjusting and maintaining heating equipment.
Co-requisite: ELEA 101, (MATH 081 or LVM 1)

Overall Course Objectives

Upon completion of this course the student will be able to:

1. Understand the installation, procedures involved with oil, gas, mechanical and electric heating systems.
2. Perform maintenance, service and repairs on oil, gas, mechanical and electric heating systems.

Major Topics

I. Define combustion.
II. Describe applications of fuel oils.
III. Identify components of gas, oil, and electric heating units.
IV. Explain the differences between propane and natural gas furnaces
V. Size gas piping.
VI. Explain and illustrate gas pilot ignition methods.
VII. Identify types of gas burners and heat exchangers.
VIII. Adjust pilot and main burner flame.
IX. Adjust gas regulator pressures.
X. Test gas furnace efficiency.
XI. Change blower speeds.
XII. Determine furnace heat output.
XIII. Test a thermocouple
XIV. Identify components of condensing gas furnaces.
XV. Identify types of oil burners.
XVI. Check fuel pump operation.
XVII. Adjust electrodes.
XVIII. Test ignition transformers
XIX. Test flame detectors.
XX. Test and adjust oil burners form maximum efficiency.
XXI. Describe the operation of sequencers and heat relays in electric furnaces.
XXII. Describe methods of humidification in forced air heating systems.
XXIII. Describe a basic hydronic heating system.
XXIV. Describe safety and operating controls for hydronic systems.
XXV. Describe methods of filling and purging hydronic systems.
XXVI. Describe methods of zoning.
XXVII. Describe the difference between passive and active solar heating systems.
XXVIII. List the typical components of an air-based solar system.
XXIX. List the typical components of a water-based solar system.

XXX. List factor affecting design and installation of solar heating systems.

Course Requirements

Grading: Grading procedures will be determined by the individual faculty member but will include the following:

1. Attendance and participation.
2. Two written exams mid-term and final.
3. A minimum of three quizzes.
4. Two practical lab exams, mid-term and final exam.
5. Twelve lab assignments.

Other Course Information

This is an AIRC core course.