

Common Course Outline
AIRC 215
Residential Load Calculations & Air Distribution
3 Semester Hours

The Community College of Baltimore County

Description

AIRC 215 - 3 Credits - Residential Load Calculations & Air Distribution introduces methods to calculate heat losses and gains (loads) for residential and commercial applications using the Air Conditioning Contractors of America (ACCA) Manual J and Manual D procedures and computer software programs. Students learn to select the proper heating and cooling equipment for maximum comfort and energy efficiency. The course also introduces air side equipment, components from manufacturers specifications, and various instruments used to test and balance air distribution systems.

3 credits: 3 lecture hours per week

Prerequisite: AIRC 205 and AIRC 210 or approval of program coordinator

Overall Course Objectives

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

1. calculate heating and cooling requirements for residential structures;
2. select heating and cooling equipment;
3. use air friction charts to determine duct sizes;
4. calculate energy consumption and operating costs;
5. explore computer applications for load and energy analysis;
6. present the process used to design an air distribution system;
7. use manufacturers' data to determine static pressures and pressure drops;
8. determine insulation requirements for ducts in unconditioned spaces;
9. select materials, fittings, and accessories for duct systems; and
10. describe techniques for installing, balancing and troubleshooting air distribution systems.

Major Topics

- I. Inside and outside design conditions for load analysis
- II. Construction materials and methods
- III. R-factor
- IV. Heat transfer and losses
- V. Heat gain
- VI. Heating and cooling equipment
- VII. Energy consumption
- VIII. Psychrometric process
- IX. Air system components

X. Duct systems

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member and will be provided on the first day of class.

The following will be required for this course:

1. Approved practical project or written paper
 - If a written paper is assigned, the following will apply:
 - a. Topic of the paper will be selected by the student and should relate to the subject material of the course.
 - b. The paper should be six (6) to eight (8) pages in length, typewritten, and double-spaced. It should include in addition to the six (6) to eight (8) pages of text, an author and title page and bibliography utilizing a minimum of three reference resources excluding classroom materials.
 - c. All papers are due when 80% of the class sessions are completed.
2. Midterm exam
3. Comprehensive final
4. Minimum of three (3) classroom assignments
5. Minimum of four (4) homework assignments
6. Class discussion and participation

Other Course Information

This is a Heating, Ventilating, Air Conditioning, and Energy Technology program requirement.