

AIRC 220

RESIDENTIAL AIR DISTRIBUTION

3 Semester Hours

The Community College of Baltimore County

Description

Residential Air Distribution

Studies air distribution systems in residential applications and system design based on the procedures in the ACCA Manual D; introduces air side equipment, components from manufacturers specifications, and various instruments used to test and balance air distribution systems.

Prerequisite: (MATH 081 or LVM 1) or consent of the instructor.

Overall Course Objectives

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

1. Understand the process of designing air distribution system.
2. Know how to select materials, fittings, and accessories for a duct systems.
3. Describe techniques for installing, balancing and troubleshooting air distribution systems.

Major Topics

- I. Recognize air system components.
- II. Identify various types of duct systems.
- III. Outline procedures for designing duct systems.
- IV. Use air friction charts to determine round duct sizes.
- V. Recognize types of fans, their applications, and limitations.
- VI. Calculate actual (measured) length, equivalent length, and total effective length of ducts.
- VII. Select the proper type of system for a given situation.
- VIII. Prepare a layout of the supply and return ducts for a job.
- IX. Calculate design static pressures for supply and return ducts.
- X. Use a duct calculator to determine duct sizes, air volume and air velocity.
- XI. Apply criteria for air velocity to sizing ducts for sound attenuation.
- XII. Convert round duct sizes to equivalent rectangular duct sizes.
- XIII. Select supply and return grilles, registers and diffusers.
- XIV. Select duct fittings and accessories.
- XV. Use manufacturers data to determine static pressures and pressure drops.
- XVI. Select duct materials, e.g. sheet metal, fiberglass, flexible, etc.
- XVII. Determine insulation requirements for ducts in unconditioned spaces.
- XVIII. Evaluate effects of duct design on operating costs.
- XIX. Calculate fabrication costs as a function of type of material and duct dimension (aspect ratio).
- XX. Describe computer applications for duct design.
- XXI. Identify instruments used to measure static pressure, velocity pressure and air velocity in duct systems.
- XXII. Calculate CFM using velocity pressure measurements.
- XXIII. Determine CFM using pressure drop measurements.
- XXIV. Calculate CFM by the temperature rise method.

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 four quizzes.
4. A minimum of 10 homework assignments.

Other Course Information

This is an AIRC core course.