

AIRC 223

Commercial HVAC Systems

3 Credits (3 Lecture hours per week)

Community College of Baltimore County
Common Course Outline

Description

AIRC 223 – Commercial HVAC Systems: explores the technology used in commercial, institutional, and industrial cooling systems. Course work includes analysis of system performance and diagnosis of problems. Students examine equipment such as reciprocating and centrifugal chillers, absorption systems, cooling towers, fans, and air handlers. Emphasis is placed on psychrometrics, pressure-enthalpy diagrams, and commercial load calculations.

Pre-requisites:

Co-requisites: Remove if empty

Overall Course Objectives

Upon completion of this course, students will be able to:

1. identify the components of a large commercial cooling system;
2. describe the operation of a chiller/cooling tower/pump system;
1. relate psychrometrics, pressure-enthalpy diagrams, and commercial load calculations to commercial air conditioning processes;
2. explain the composition of acceptable air quality;
3. explain the relationship between pressure and temperature;
4. correlate the gas laws as they relate to HVAC;
5. explain the difference between conduction, convection, and radiation;
6. explain the effects of occupancy loads;
1. perform heat gain and loss calculations from prescribed plans using a calculation form or computer program;
2. calculate efficiency ratings of different cooling systems;
3. calculate costs of operation of systems with various efficiency ratings;
4. demonstrate methods of system charging;
5. analyze air and water vapor mixtures;
6. list the proper maintenance procedures for commercial cooling system applications; and
7. demonstrate the procedure for startup and operation of commercial systems.

Major Topics

- I. Human comfort
- II. Physical principles of heat
- III. Building heat loss and gain
- IV. Efficiency ratings
- V. Thermodynamics and the refrigeration cycle

The Common Course Outline (CCO) determines the essential nature of each course.

For more information, see your professor's syllabus.

- VI. System charging
- VII. Psychrometrics
- VIII. Compressors
- IX. Condensers and cooling towers
- X. Absorption systems

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Approved practical project or written paper
 - If a written paper is assigned, the following will apply:
 - Topic of the paper will be selected by the student and should relate to the subject material of the course
 - 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
 - All papers are due when 80% of the class sessions are completed
- Midterm exam
- Comprehensive final
- Minimum of three (3) classroom assignments
- Minimum of four (4) homework assignments
- Class discussion and participation

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

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

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