

APSM 179A: BUILDING & CASCADING PRESSURES/AIR CHANGE TESTING

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	2
Hours:	24 lecture, 16 laboratory per quarter (40 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Apprenticeship Program.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- A successful student will be able to describe resources that define ACH (Air Changes per Hour) requirements.
- A successful student will be able to adjust airflow values to achieve specified pressure differentials.

Description

Students will perform and calculate air changes per hour on building spaces, adjust room and building pressure differentials and prepare associated required documentation, per industry standards.

Course Objectives

The student will be able to:

1. Define formula to determine air changes per hour (ACH)
2. Describe resources that define ACH requirements
3. Perform an air change per hour test and prepare a sample report
4. Describe methods of determining pressure differentials using various instruments
5. Identify components of airflow and room pressure drawings
6. Define components that affect room/building pressure differentials
7. Perform room pressure differential readings
8. Adjust airflow values to achieve specified pressure differentials
9. Document airflow pressure differential readings to industry standards

Course Content

1. Define formula to determine air changes per hour (ACH)
 - a. Define the variables in the air change per hour formula (Lec)
2. Describe resources that define ACH requirements
 - a. Identify industry organizations that set ACH standards and requirements (Lec)

3. Perform an air change per hour test and prepare a sample report
 - a. Measure and calculate room volume (Lec and Lab)
 - b. Measure supply, return and exhaust air flows in a room (Lec and Lab)
 - c. Calculate ACH and document on report form (Lec and Lab)
4. Describe methods of determining pressure differentials using various instruments
 - a. Measure pressure differentials using liquid manometer, Magnehelic gauge, digital manometer, pressure direction indicator (Lec and Lab)
5. Identify components of airflow and room pressure drawings
 - a. Describe elements on an airflow schematic drawing (Lec and Lab)
 - b. Define elements on a room pressure diagram (Lec and Lab)
6. Define components that affect room/building pressure differentials
 - a. Define the airflow components that affect building pressures (Lec and Lab)
 - b. Define the airflow components that affect room pressures (Lec and Lab)
7. Perform room pressure differential readings
 - a. Perform initial room pressure readings and document values (Lec and Lab)
8. Adjust airflow values to achieve specified pressure differentials
 - a. Adjust return air, exhaust air and door sweeps to achieved required room pressure differentials (Lec and Lab)
9. Document airflow pressure differential readings to industry standards
 - a. Prepare a sample room pressure differential report to TABB standards (Lec and Lab)

Lab Content

1. Perform initial room pressure readings and document values
2. Adjust return air, exhaust air and door sweeps to achieved required room pressure differentials

Special Facilities and/or Equipment

1. Laboratory with sheet metal test and balance tools and sample system components
2. Personal protective equipment
3. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of written quizzes and tests
 Responses in class discussions
 Demonstration of assigned skills to acceptable level per instructor
 Comprehensive final project

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
 Discussion
 Demonstration
 Lab assignments followed by discussion

Representative Text(s) and Other Materials

Sheet Metal and Air Conditioning Contractors National Association. HVAC Systems Duct Design, 4th ed.. 2006.

International Training Institute for the Sheet Metal and Air Conditioning Industry. Testing, Adjusting & Balancing of Environment Systems. 2003.

These are the standard sheet metal textbooks/workbooks used for this course. Although one or more may not be within five years of the required published date, they are the most current books used when teaching this course.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Sample reading assignment: From the textbook, sections on SMACNA
2. Sample writing assignment: Define elements on a room pressure diagram

Discipline(s)

Sheet Metal