

# APSM 178A: INDOOR AIR QUALITY

## Foothill College Course Outline of Record

Heading	Value
<b>Units:</b>	2
<b>Hours:</b>	28 lecture, 12 laboratory per quarter (40 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Apprenticeship Program.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	None
<b>Grade Type:</b>	Letter Grade (Request for Pass/No Pass)
<b>Repeatability:</b>	Not Repeatable

## Student Learning Outcomes

- A successful student will be able to describe the evolution and need for increased building envelope integrity.
- A successful student will be able to describe specialized IAQ instruments used in IAQ studies.

## Description

Students will explain basic factors of air quality, demonstrate the use of indoor air quality test instruments and perform various tests to prepare a sample IAQ report.

## Course Objectives

The student will be able to:

- Describe the history and evolution of building indoor air quality (IAQ) issues
- Describe the instruments used in IAQ audits
- Describe the strategies used in performing IAQ audits
- Identify common IAQ issues in buildings
- Demonstrate the use of instruments to perform IAQ readings
- Prepare a sample IAQ report

## Course Content

- Describe the history and evolution of building indoor air quality (IAQ) issues
  - Describe the evolution and need for increased building envelope integrity (Lec)
  - Describe the impact of build envelope integrity to indoor air quality issues (Lec)
- Describe the instruments used in IAQ audits
  - Describe the standard air balance instruments that can be used in IAQ studies (Lec and Lab)
  - Describe specialized IAQ instruments used in IAQ studies (Lec and Lab)
- Describe the strategies used in performing IAQ audits
  - Describe strategies to perform a basic IAQ audit (Lec)
  - Describe strategies to perform an intermediate IAQ audit (Lec)

- Describe strategies to perform a comprehensive IAQ audit (Lec)
- Identify common IAQ issues in buildings
  - Identify the most common sources of building IAQ issues (Lec and Lab)
  - Describe possible solutions for IAQ issues (Lec and Lab)
  - Describe various resources to find chemical exposure limits for building occupants (Lec and Lab)
- Demonstrate the use of instruments to perform IAQ readings
  - Demonstrate the use of an air data multi meter and thermometer to determine outside air percentage (Lab)
  - Demonstrate the use of a CO2 meter (Lab)
  - Demonstrate the use of a VOC meter (Lab)
  - Demonstrate the use of a sampling tube pump (Lab)
- Prepare a sample IAQ report
  - Prepare a sample request for proposal for an IAQ audit (Lec and Lab)
  - Prepare a sample IAQ audit report (Lec and Lab)

## Lab Content

- Demonstrate the use of an air data multi meter and thermometer to determine outside air percentage.
- Demonstrate the use of a VOC meter.
- Demonstrate the use of a sampling tube pump.

## Special Facilities and/or Equipment

- Laboratory with sheet metal test and balance tools and sample system components
- Personal protective equipment

## Method(s) of Evaluation

- 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

- Lecture
- Discussion
- Demonstration
- Lab assignments followed by discussion

## Representative Text(s) and Other Materials

International Training Institute for the Sheet Metal and Air Conditioning Industry. [HVAC](#). Alexandria, VA: International Training Institute, 2005.

Sheet Metal and Air Conditioning Contractors National Association. [Indoor Air Quality: A Systems Approach](#). 3rd ed. Chantilly, VA: SMACNA, 1998.

American Society of Heating, Refrigeration and Air Conditioning Engineers. [ANSI/ASHRAE Standard 62.1-2016 Ventilation for Acceptable Indoor Air Quality](#). Atlanta, GA: ASHRAE, 2016.

NOTE: These are the standard Sheet Metal textbooks/workbooks used for this course. Although one or more may not be within 5 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**

A. Sample reading assignments: From the textbooks, readings on ITI Indoor Air Quality (IAQ); readings on SMACNA.

B. Sample writing assignment: Prepare a sample IAQ audit report.

## **Discipline(s)**

Sheet Metal