

# APSM 179C: BIOLOGICAL SAFETY CABINETS/LABORATORY FUME HOODS

## Foothill College Course Outline of Record

Heading	Value
<b>Units:</b>	2
<b>Hours:</b>	24 lecture, 16 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 discuss the purpose and differences of Bio Safety Cabinets and Laboratory Fume Hoods.
- A successful student will be able to perform and document bio-safety and laboratory fume hood tests according to applicable codes and standards.

## Description

Students will identify various types of laboratory fume hoods and biological safety cabinets and describe the function of each style. Students will follow proper industry standards to test laboratory fume hoods and biological safety cabinets to required industry standards.

## Course Objectives

The student will be able to:

- Discuss the purpose and differences of biological safety cabinets and laboratory fume hoods
- Discuss evolution of fume hoods
- Discuss the standards and codes pertaining to fume hoods and biological safety cabinets
- Identify the components of a laboratory fume hood
- Describe how a laboratory fume hood functions
- Describe different styles of fume hoods
- Identify the instruments and equipment used in the testing of fume hoods
- Define the procedures used in fume hood testing
- Define the components of a biological safety cabinet
- Describe how a biological safety cabinet functions
- Identify the instruments and equipment used in the testing of biological safety cabinets

## Course Content

- Discuss the purpose and differences of biological safety cabinets and laboratory fume hoods

- Discuss the purpose of a laboratory fume hood (Lec)
- Discuss the purpose of biological safety cabinet (Lec)
- Discuss the differences of biological safety cabinets and laboratory fume hoods (Lec)
  - Discuss evolution of fume hoods (Lec)
  - Discuss the standards and codes pertaining to fume hoods and biological safety cabinets
    - Discuss the standards and codes pertaining to laboratory fume hoods (Lec and Lab)
    - Discuss the standards and codes pertaining to biological safety cabinets (Lec and Lab)
  - Identify the components of a laboratory fume hood (Lec and Lab)
  - Describe how a laboratory fume hood functions
    - Describe the functions of laboratory fume hood components (Lec and Lab)
    - Describe the sequence of operations of a fume hood as a system in various environments (Lec and Lab)
  - Describe different styles of fume hoods
    - Identify seven different styles of fume hoods (Lec and Lab)
  - Identify the instruments and equipment used in the testing of fume hoods
    - Demonstrate operation of fume hood test instruments (Lec and Lab)
- Define the procedures used in fume hood testing
  - Discuss ASHRAE 110, OSHA, CDC and Cal OSHA testing requirements (Lec and Lab)
  - Perform tests on laboratory fume hood (Lec and Lab)
- Define the components of a biological safety cabinet
  - Identify the components of a biological safety cabinet (Lec and Lab)
  - Identify various styles of biological safety cabinets (Lec and Lab)
- Describe how a biological safety cabinet functions
  - Describe the function of a biological safety cabinet (Lec and Lab)
- Identify the instruments and equipment used in the testing of biological safety cabinets
  - Identify the instruments and equipment used in the testing of biological safety cabinets (Lec and Lab)
  - Discuss NSF 49, OSHA, CDC and Cal OSHA testing requirements (Lec and Lab)
  - Perform tests on biological safety cabinets (Lec and Lab)

## Lab Content

- Perform performance and safety tests on a laboratory fume hood, per standards.
- Perform tests on biological safety cabinets.

## 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
- Comprehensive written final examination
- Demonstration of assigned skills to acceptable level per instructor

## Method(s) of Instruction

- Lecture
- Discussion
- Demonstration

D. Lab assignments followed by discussion

## **Representative Text(s) and Other Materials**

International Training Institute for the Sheet Metal and Air Conditioning Industry. Laboratory Fume Hood Performance Testing. Alexandria, VA: International Training Institute, 2012.

American Society of Heating, Refrigeration and Air Conditioning Engineers. ANSI/ASHRAE Standard 110-2016 Method of Testing Performance of Laboratory Fume Hoods. 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 assignment: From the textbook, standards regarding fume hood and biological safety cabinets, purpose, functions, and testing.

B. Sample writing assignment: Discuss NSF 49, OSHA, CDC and Cal OSHA testing requirements for biological safety cabinets.

## **Discipline(s)**

Sheet Metal