

# APSM 176A: PLANS & SPECIFICATIONS, CODES & STANDARDS

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	2.5
Hours:	30 lecture, 10 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 the building codes that impact TAB.
- A successful student will be able to describe the legal application of plans and specifications, codes and standards.

## Description

Students will explain the organization of construction documentation specifications and plans used in the TAB HVAC industry. Students will prepare a TAB bid estimate, per standards used in the TAB industry.

## Course Objectives

The student will be able to:

1. Describe the legalities of plans and specifications, codes and standards
2. Describe flexible and inflexible specifications
3. Describe the purpose of an RFI and properly prepare an RFI and change order
4. Explain the organization of construction specifications
5. Define the HVAC and TAB related sections in a building specification
6. Describe and prepare a "take off" list for a sample TAB project
7. Describe and prepare a "submittal" for a sample TAB project
8. Describe the building codes that impact TAB
9. List the ASHRAE standards that have direct impact to TAB
10. List the SMACNA standards that have direct impact to TAB
11. List the industry standards and certifications that have direct impact to TAB
  - a. Compare and contrast the three main certifying agencies for the TAB industry (Lec)
  - b. Describe other specialty certifications offered by TABB, AABC and NEBB (Lec)
  - c. Describe other industry certifications, such as NSF49, NAFA, EPA 608 (Lec)
  - d. Describe CDC, OSHA, ISO and FS209E and other government standards (Lec)

## Course Content

1. Describe the legal importance of plans and specifications, codes and standards
  - a. Describe the terms: plans, specifications, codes, standards (Lec)
  - b. Describe the legal importance of plans, specifications, codes, standards (Lec)
2. Describe flexible and inflexible specifications
  - a. Define the difference of flexible and inflexible specifications (Lec)
  - b. Identify examples of flexible and inflexible specifications from sample specifications (Lec)
3. Describe the purpose of an RFI and properly prepare an RFI and change order
  - a. Define an RFI and its purpose (Lec)
  - b. Prepare a sample RFI and associated change order (Lec and Lab)
4. Explain the organization of construction specifications
  - a. Describe the layout format of building specifications (Lec)
  - b. Define the importance and demonstrate an example of documenting revisions (Lec and Lab)
5. Define the HVAC and TAB related sections in a building specification
  - a. Define the specification sections that relate to HVAC and TAB (Lec)
6. Describe and prepare a "take off" list for a sample TAB project
  - a. Describe the process to create a job take off (Lec)
  - b. Prepare a sample TAB job take off from sample plans and specifications (Lec and Lab)
7. Describe and prepare a "submittal" for a sample TAB project
  - a. Describe the process to create or obtain submittals (Lec)
  - b. Prepare a sample TAB submittal from sample plans and specifications (Lec and Lab)
8. Describe the building codes that impact TAB
  - a. Describe the building, mechanical, green, fire and life safety codes that impact TAB work (Lec)
9. List the ASHRAE standards that have direct impact to TAB
  - a. Define the ASHRAE standards that impact TAB work (Lec)
  - b. Describe the importance and impact of the ASHRAE 62 ventilation standards (Lec)
  - c. Describe the importance and impact of the ASHRAE 111 TAB standards (Lec)
10. List the SMACNA standards that have direct impact to TAB
  - a. Describe the SMACNA standards that impact TAB work (Lec)
11. List the industry standards and certifications that have direct impact to TAB
  - a. Compare and contrast the three main certifying agencies for the TAB industry (Lec)
  - b. Describe other specialty certifications offered by TABB, AABC and NEBB (Lec)
  - c. Describe other industry certifications, such as NSF49, NAFA, EPA 608 (Lec)
  - d. Describe CDC, OSHA, ISO and FS209E and other government standards (Lec)

## Lab Content

1. Locate TAB related data in the plans and specifications for a building
2. Compare data from existing components with plans and specifications design data

## 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
- Comprehensive written final examination
- 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

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

International Training Institute for the Sheet Metal and Air Conditioning Industry. HVAC. 2005.

American Society of Heating, Refrigeration and Air Conditioning Engineers. ANSI/ASHRAE Standard 62.1-2016 Ventilation for Acceptable Indoor Air Quality. 2016.

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, assigned sections on ASHRAE Standard 62.1
2. Sample writing assignment: Describe the importance and impact of ASHRAE 62 ventilation standards on HVAC systems TAB requirements

## Discipline(s)

Sheet Metal