

# APSM 174B: BALANCING DOCUMENTATION, COOLING TOWERS & TAB RELATED SKILLS

## 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 calculate cooling tower range and approach.
- A successful student will be able to complete balance report forms for an HVAC system.

## Description

Students will use Microsoft Word and Excel to complete reporting documentation used in the TAB industry. Students will determine performance values of cooling towers used in HVAC systems.

## Course Objectives

The student will be able to:

1. Define required information to complete balancing test forms
2. Record preliminary data required to proportion balance a system
3. Identify forms required to complete
4. Discuss and perform proper coding of an HVAC drawing
5. Complete balance report forms for an HVAC system
6. Describe the purpose of a cooling tower
7. Determine the components and function of a cooling tower
8. Identify different styles of cooling towers
9. Define the formulas for cooling tower range and approach
10. Calculate cooling tower range and approach
11. Define Net Positive Suction Head (NPSH) and Net Positive Suction Head Available (NPSHa)
12. Demonstrate the basic functions of Microsoft Word
13. Demonstrate the basic functions of Microsoft Excel

## Course Content

1. Define required information to complete balancing test forms (Lec)
  - a. Define the required information on a completed balance report (Lec)
  - b. Describe where information to complete a balance report can be located (Lec)
2. Record preliminary data required to proportion balance a system (Lec and Lab)
  - a. Record required preliminary information onto sample report forms (Lec)
3. Identify forms required to complete a balance report (Lec)
4. Discuss and perform proper coding of an HVAC drawing
  - a. Discuss methods of coding HVAC drawings for TAB testing (Lec)
  - b. Properly code a sample HVAC drawing for TAB testing (Lec and Lab)
5. Complete balance report forms for an HVAC system (Lec)
  - a. Properly identify and complete sample report forms for an HVAC system (Lec)
6. Describe the purpose of a cooling tower
  - a. Describe the purpose and function of a cooling tower (Lec)
7. Determine the components and function of a cooling tower
  - a. Describe the components in a cooling tower (Lec and Lab)
  - b. Describe the function of various components in a cooling tower (Lec and Lab)
8. Identify different styles of cooling towers (Lec and Lab)
9. Define the formulas for cooling tower range and approach (Lec)
  - a. Define the formula for cooling tower range and its purpose (Lec)
  - b. Define the formula for cooling tower approach and its purpose (Lec)
10. Calculate cooling tower range and approach (Lec)
  - a. Calculate cooling tower range and approach values from given readings (Lec and Lab)
11. Define Net Positive Suction Head (NPSH) and Net Positive Suction Head Available (NPSHa)
  - a. Define NPSH in a cooling tower system (Lec and Lab)
  - b. Describe the importance of NPSH in a cooling tower system (Lec and Lab)
  - c. Calculate NPSHa in a cooling tower system (Lec and Lab)
12. Demonstrate the basic functions of Microsoft Word
  - a. Demonstrate the use of open, save, input and edit features in Microsoft Word (Lec and Lab)
13. Demonstrate the basic functions of Microsoft Excel
  - a. Demonstrate the use of open, save, input and edit features in Microsoft Excel (Lec and Lab)

## Lab Content

1. Properly code a sample HVAC drawing for TAB testing
2. Calculate Net Positive Suction Head Available (NPSHa) in a cooling tower system

## Special Facilities and/or Equipment

1. Laboratory with sheet metal test and balance tools and sample system components
2. Personal protective equipment
3. Computers with Microsoft Word and Excel

4. 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

## 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.

This is the standard sheet metal textbook/workbook used for this course. Although it may not be within five years of the required published date, it is the most current book 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 cooling towers
2. Sample writing assignment: Properly identify and complete sample report forms for an HVAC system

## Discipline(s)

Sheet Metal