

APSM 175A: TABB TECHNICIAN CERTIFICATION

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	2
Hours:	20 lecture, 20 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 achieve TABB Technician certification.
- A successful student will be able to calibrate a velocity reset controller for a VAV terminal unit.
- A successful student will be able to perform a duct pitot tube traverse on a HVAC system.

Description

Students will demonstrate proper test and balance skills and achieve TABB Technician certification.

Course Objectives

The student will be able to:

1. Describe formulas used in TAB industry
2. Describe fundamentals of psychrometrics
3. Describe basic HVAC control strategies in HVAC
4. Calculate BTU in heat transfer functions
5. Determine ratio of tolerance and key outlets in air systems
6. Determine pump impeller diameter and flow in hydronic pumps
7. Calculate absolute pressure from gauge pressures
8. Perform a static profile of an HVAC system
9. Calibrate a velocity reset controller for a VAV terminal unit
10. Perform a duct pitot tube traverse on a HVAC system
11. Proportionally balance a constant volume HVAC air system
12. Proportionally balance a constant volume HVAC hydronic system

Course Content

1. Describe formulas used in TAB industry
 - a. Describe the belt length calculation formula and calculate BHP and fan static efficiency (Lec and Lab)
 - b. Determine Ak factor for an air register (Lec and Lab)

2. Describe fundamentals of psychrometrics
 - a. Describe dry bulb, wet bulb, dew point and relative humidity (Lec and Lab)
 - b. Determine psychrometric values on a psychrometric chart (Lec and Lab)
3. Describe basic HVAC control strategies in HVAC
 - a. Discuss the three main components in a control loop (Lec)
 - b. Discuss electric, pneumatic, hybrid and DDC control systems (Lec)
4. Calculate BTU in heat transfer functions
 - a. Calculate BTU in an air stream and water coil (Lab)
 - b. Determine heat transfer between air and water (Lab)
5. Determine ratio of tolerance and key outlets in air systems
 - a. Describe the ratio of tolerance when performing TAB (Lec and Lab)
 - b. Calculate the ratio of tolerance allowed from a given tolerance standard (Lec and Lab)
 - c. Calculate percentage of design with given airflow readings (Lec and Lab)
 - d. Determine key outlet from percentage of design (Lec and Lab)
6. Determine pump impeller diameter and flow in hydronic pumps
 - a. Perform a block tight test on a pump to determine TDH (Lec and Lab)
 - b. Determine pump impeller using TDH and a pump curve (Lec and Lab)
 - c. Determine flow using TDH and a pump curve (Lec and Lab)
7. Calculate absolute pressure from gauge pressures
 - a. Determine PSIG from a gauge and calculate PSIA (Lab)
8. Perform a static profile of an HVAC system
 - a. Perform a static profile of an air handling unit and its components (Lab)
9. Calibrate a velocity reset controller for a VAV terminal unit
 - a. Calibrate the maximum and minimum flow set point on a pneumatic reset controller (Lec and Lab)
10. Perform a duct pitot tube traverse on a HVAC system
 - a. Perform a rectangular and round duct pitot traverse to SMACNA standards (Lab)
11. Proportionally balance a constant volume HVAC air system
 - a. Perform a proportion balance on a HVAC air system to SMACNA standards (Lab)
12. Proportionally balance a constant volume HVAC hydronic system
 - a. Perform a proportion balance on a HVAC hydronic system to SMACNA standards (Lab)

Lab Content

1. Practice and demonstrate proficiency in skills required for Test Adjust and Balance Bureau Technician certification

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 examination to certification level
Comprehensive practical skills demonstration to certification level

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, review related sections in preparation for the certification exam
2. Sample writing assignment: Describe the belt length calculation formula

Discipline(s)

Sheet Metal