

APPT 177: START, TEST & BALANCE I

Foothill College Course Outline of Record

Heading	Value
Units:	4
Hours:	24 lecture, 75 laboratory per quarter (99 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Refrigeration & Air Conditioning Mechanical Service 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 student will be able to demonstrate fluid control/air balance.
- A student will be able to apply psychometrics.

Description

This course provides students with an introduction to Start, Test and Balance for fluid distribution. Ducting, Cooling, Fans, and Air Distribution is covered in the laboratory exercises.

Course Objectives

The student will be able to:

- Recognize and classify fluid flow
- Recognize duct systems and explain sizing
- Recognize fans and explain fan laws
- Explain air distribution
- Explain psychometrics

Course Content

- Fluid Flow
 - Study of velocity in relationship to fluids
 - Static control and fluid measurements
 - Total pressure and performing pressure calculations
- Duct Systems and Sizing
 - Review of basic duct plans
 - Sizing ducting based on air flow requirements
 - Specifications of ducts
- Fans and Fan Laws
 - Review of air plenums
 - Calculating cubic feet per minute (CFM)
 - Fan sizing for commercial applications
- Air Distribution
 - Proper layout of feeders
 - Introduction of chillers
 - Cubic feet per minute for air distributors
- Psychometrics

- Introduction to psychometrics
- Various forms of psychological measurement for the plumbing trade
- Types of measurements performed on heating, ventilation, and air conditioning (HVAC) systems

Lab Content

Students will work individually and in teams in the lab, which includes:

- Testing the flow of fluid through a complete hydraulic system
- Balancing out volume and pressure within the hydraulic system
- Service a Test & Balance system

Special Facilities and/or Equipment

- Laboratory with overhead projector
- Personal protective equipment

Method(s) of Evaluation

- Written examination
- Hands-on demonstration
- Chapter Quizzes
- Group and Classroom participation

Method(s) of Instruction

- Lecture
- Discussion
- Laboratory
- Demonstration

Representative Text(s) and Other Materials

United Association of Journeymen and Apprentices. [Start Test and Balance](#). Washington, D.C.: International Pipe Trades Joint Training Committee, Inc., 2014.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- Readings from the course textbook

- Start, Test & Balance: Theory and Practice, Chapter 1, pgs 6-17
- NJS-PAC S T & B text on interpreting commissioning specifications
- Finish Air Balancing & Distribution Practices
- Introduction to Hydronics & Applications

B. Writing assignments are related to the assignments given in the laboratory and include:

- Prepare a diagram on Refrigeration & Air Conditioning for a Start, Test and Balance system
- Prepare a paper to discuss the meaning of psycho-metrics
- South San Francisco field trip term paper on Variable Speed Hot & Chilled Water systems at Genentech Corporation
- Lab manual entries per lab assignment

Discipline(s)

Air Conditioning, Refrigeration, Heating