

APED 361 Course Outline as of Fall 2025**CATALOG INFORMATION**

Dept and Nbr: APED 361 Title: APP PLUMBERS, HVAC, 2ND
 Full Title: Apprentice Plumbers, HVAC/Refrigeration, Second Semester
 Last Reviewed: 5/13/2024

Units	Course Hours per Week	Nbr of Weeks	Course Hours Total
Maximum 4.00	Lecture Scheduled 3.00	18	Lecture Scheduled 54.00
Minimum 4.00	Lab Scheduled 3.00	8	Lab Scheduled 54.00
	Contact DHR 0		Contact DHR 0
	Contact Total 6.00		Contact Total 108.00
	Non-contact DHR 0		Non-contact DHR 0

Total Out of Class Hours: 108.00

Total Student Learning Hours: 216.00

Title 5 Category: AA Degree Non-Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Students will be introduced to training related to heating, ventilation, air conditioning (HVAC), and refrigeration for apprentice plumbers and pipefitters. This is the second semester of a ten-semester program.

Prerequisites/Corequisites:**Recommended Preparation:****Limits on Enrollment:**

Indentured apprentice

Schedule of Classes Information:

Description: Students will be introduced to training related to heating, ventilation, air conditioning (HVAC), and refrigeration for apprentice plumbers and pipefitters. This is the second semester of a ten-semester program. (Grade Only)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment: Indentured apprentice

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Effective:	Inactive:
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UC Transfer:	Effective:	Inactive:
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CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Describe and demonstrate electrical and plumbing principles and regulations related to heating, ventilation, air conditioning, and refrigeration trade
2. Apply best practices in the practical environment related to heating, ventilation, air conditioning, and refrigeration trade

Objectives:

At the conclusion of this course, the student should be able to:

1. Explain and utilize computer aided design (CAD) drawing
2. Describe and demonstrate the general principals of refrigeration as applied to HVAC systems
3. Relate the history and contemporary issues of the pipe trades unions
4. Demonstrate best practices in customer service

Topics and Scope:

- I. Computer Components and Functions related to Computer Aided Design (CAD)
 - A. Computer specifications needed for CAD
 - B. Types and uses of various computer software applications for HVAC design
- II. Computer Aided Design Software in HVAC System Design - Basic Principals of Using CAD-designed Drawings for HVAC Installation
- III. Electronic Engineering Architectural Drawing for Refrigeration Installation in HVAC System Design
- IV. Conservation and Safe Handling of Refrigeration Fluids
 - A. Signage, containment practices, and disposal
 - B. First aid for exposure to irritants
- V. Pipe Trades Heritage and Organization
- VI. Techniques to Monitor and Improve Customer Service Skills

All topics are covered in the lecture and lab portions of the course

Assignment:

Lecture-Related Assignments:

1. Weekly reading 10-15 pages
2. Written homework assignments (1 to 2 sets per week)
3. Project homework assignments (1 to 2 sets per week)
4. Quizzes and examinations (4 to 6 per semester)

Lab-Related Assignment:

1. Class performances and field work (on-the-job demonstrations) of skill development, safety practices, equipment, and material handling

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework assignments; field work

Problem solving
10 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances; field work

Skill Demonstrations
50 - 65%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes and examinations

Exams
10 - 20%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation

Other Category
5 - 10%

Representative Textbooks and Materials:

Your Heritage & Future in the Pipe Trades. International Pipe Trades Joint Training Committee. 2020. (classic).

Refrigerant Controls. International Pipe Trades Joint Training Committee. 2019. (classic).

Auto CAD Perpetual Software. International Pipe Trades Joint Training Committee 2024.