

# APEL 122: CODEOLOGY; TEST EQUIPMENT; PIPE BENDING; BLUEPRINTS

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2023
<b>Units:</b>	4
<b>Hours:</b>	24 lecture, 72 laboratory per quarter (96 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Electrical Apprenticeship Program.
<b>Advisory:</b>	Not open to students with credit in APRT 122.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	None
<b>Grade Type:</b>	Letter Grade (Request for Pass/No Pass)
<b>Repeatability:</b>	Not Repeatable

## Student Learning Outcomes

- A student will apply theory to transformers and connections.
- A student will be able to explain principles & theory of electricity and magnetism.
- A student will be able to explain the Codeology method.
- A successful student will be able to calculate load.

## Description

Study of the National Electrical Code, AC theory, and basic fundamentals of using blueprints.

## Course Objectives

The student will be able to:

1. Define the National Electrical Code
2. Apply codeology to building plans and drawings
3. Demonstrate an understanding of AC theory
4. Demonstrate how to effectively read blueprints

## Course Content

1. National Electrical Code
  - a. Orientation
  - b. Language
  - c. Exceptions
  - d. Utilizing codebook
2. Codeology
  - a. Plan
  - b. Build
  - c. Use

3. AC theory
  - a. Compare AC to DC current
  - b. Become familiar with AC resistive circuits
  - c. Understand the parameters of series AC reactive circuits
4. Effective use of blueprints
  - a. Review
  - b. Layout
  - c. Actual take-off
  - d. Blueprint specifications
  - e. Differences between wiring diagrams, line diagrams, schematics, and ladder diagrams
  - f. Use of blueprints, plans, and specifications
  - g. Correlate information from other trades plans with electrical plans to determine potential conflicts

## Lab Content

1. Students will demonstrate the proper safety techniques in the testing of voltage
2. Students will demonstrate the use of blueprints to determine electrical equipment layout
3. Students will calculate voltage drops and verify calculations through the use of voltage meters

## Special Facilities and/or Equipment

Laboratory with electrical tools and equipment.

## Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of written quizzes and average of six tests  
 Results of hands-on projects and homework  
 Results of class participation  
 Maintenance of a student's workbook with questions drawn from text

## Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture  
 Lab assignments  
 Group discussion  
 Class demonstrations

## Representative Text(s) and Other Materials

Delmar Cengage Learning. [AC Theory, 3rd ed.](#). 2011.

Jones and Bartlett Learning. [Electrical Safety-Related Work Practices](#). 2020.

Mazur, G.A.. [Test Instruments Applications Manual](#). 2006.

National Joint Apprenticeship and Training Committee. [Syllabus for Second Year Core Curriculum](#). 2022.

National Joint Apprenticeship and Training Committee. [AC Theory Student Workbook](#). 2010.

National Joint Apprenticeship and Training Committee. [Blueprints Student Workbook](#). 2005.

National Joint Apprenticeship and Training Committee. [Code and Practices -2 Student Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Code Calculations Student Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Codeology Student Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Electrical Safety-Related WP Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Transformer Student Workbook](#). 2007.

National Joint Apprenticeship and Training Committee. [Applied Codeology Navigating the NEC](#). 2020.

National Joint Apprenticeship and Training Committee. [Code Calculations](#). 2020.

Sheehan, J.V. [Blueprint Reading for Electricians, 3rd ed.](#). 2010.

Taylor, O. [Transformer: Principles and Applications](#). 2008.

These are the standard electrical textbooks/workbooks used for this course. Although some may be older than 5 years, 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. Read the syllabus on the Second Year Core Curriculum from the National Joint Apprenticeship and Training Committee Student Workbook
2. Read chapters 1-5 in the AC Theory Student Workbook for the National Joint Apprenticeship and Training Committee (NJATC)
3. Prepare a Codes and Practices worksheet from the Codes and Practices Student Workbook
4. Complete chapter 6 on Code Calculations in the NJATC Student Workbook

## **Discipline(s)**

Electricity