

# APEL 124: DC/AC THEORY REVIEW; ELECTRONICS; INDUSTRIAL BLUEPRINTS

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	4
Hours:	24 lecture, 72 laboratory per quarter (96 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Electrical Apprenticeship Program.
Advisory:	Not open to students with credit in APRT 124.
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 read and understand blueprints.
- A student will be able to use single line power diagrams.
- A student will be able to identify circuits for lighting and power.
- A successful student will be able to safely install basic electrical systems and their applications.

## Description

Review of DC/AC theory. The study of overcurrent protection and the implementation of safe work practices.

## Course Objectives

The student will be able to:

- a. Differentiate and discuss DC/AC theory
- b. Identify and select the proper overcurrent protection
- c. Demonstrate the use of safe work practices

## Course Content

- a. Review and discussion of AC and DC theory
  - i. Study of sine waves
  - ii. Study the relationship between current, voltage, and power
  - iii. Study the induction of current and transformer theory
- b. Proper overcurrent protection
  - i. Identify different types of overcurrent protection
  - ii. Describe the electrical characteristics of different types of overcurrent protections
  - iii. Utilize the National Electric Code to select overcurrent devices
- c. Safe work practices

- i. Justification of energized work
- ii. Perform an energized work hazard analysis

## Lab Content

- a. Students will utilize measurement equipment to demonstrate the difference between AC and DC voltage
- b. Students will select and install the proper overcurrent protection for transformers and motors
- c. Students will perform a hazard risk analysis and determine the proper PPE

## 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

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

National Joint Apprenticeship and Training Committee. [Code and Practices-3 Student Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Grounding & Bonding Student Workbook](#). 2020.

National Joint Apprenticeship and Training Committee. [Applied Grounding & Bonding](#). 2020.

National Joint Apprenticeship and Training Committee. [Fire Alarm Systems](#). 2021.

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**

- a. Read chapters 1-10 in the Syllabus for Third Year Core Curriculum, National Joint Apprenticeship and Training Committee (NJATC) for the Electrical Industry Student Workbook
- b. Read chapters 1-7 in the Applied Grounding & Bonding Workbook
- c. Perform a energized work hazard analysis worksheet and list the proper Personnel Protection Equipment (PPE)

## **Discipline(s)**

Electricity