

APEL 137: RESIDENTIAL ELECTRICAL A/C THEORY & CIRCUITRY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	3
Hours:	24 lecture, 51 laboratory per quarter (75 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 137.
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 demonstrate the use of Ohms Law in an AC circuit.
- A successful student will be able to properly makeup a circuit with a light, switch and a duplex receptacle.

Description

Introduction to A/C electrical theory and circuitry as they relate to residential installations; job costing and industrial standards. Further study of the National Electrical Code focusing on codeology. Expanded development of blueprint reading skills.

Course Objectives

The student will be able to:

- Expand skills of reading and analyzing blueprints
- Explain job costing and industrial standards
- Identify the National Electrical Code's key words and use the code's clues
- Discuss series and parallel circuits and apply Ohm's Law

Course Content

- Residential blueprint reading
 - Blueprint review
 - Analyzing residential blueprints
- Job costing and industrial standards
 - Actual job takeoffs
 - Communications

- Labor management relations
 - Parliamentary procedures
- National Electrical Code
 - Understanding the language of the code
 - Identifying key words
 - Using the code's clues
 - A/C electrical theory
 - Series circuits
 - Parallel circuits
 - Current
 - Voltage
 - Ohm's Law

Lab Content

Students will work individually and in teams on proper wiring and grounding of electrical systems. Safe working practices for on-the-job training include:

- Equipment safety
- Fire protection
- Electrostatic discharge (ESD)
- Safe handling practices

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
 Demonstration

Representative Text(s) and Other Materials

Callanan, Michael, and Bill Wusinich. Electrical Systems Based on the 2020 NEC. 2020.

Electrical Training ALLIANCE. Applied Codeology Navigating the 2020 NEC. 2020.

Klein, Stan, and John McCord. AC Theory, 3rd ed.. 2011.

National Fire Protection Association. National Electrical Code. 2019.

Although one or more of these texts is older than the suggested "5 years or newer" standard, it remains a seminal text in this area of study.

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

- a. Weekly reading assignments from text and outside sources
- b. Weekly lecture covering subject matter from text assignment with extended topic information
- c. Weekly lab exercises. Each lab exercise may include individual or group participation

Discipline(s)

Electricity