

# APEL 129: NATIONAL ELECTRICAL CODE REVIEW

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2021
<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 129.
<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 successful student will be able to describe the organization of the National Electrical Code.
- A successful student will be able to describe the process of adopting a National Electrical Code Standard.
- A successful student will be able to discuss the NEC Codes and their purpose.
- A successful student will be able to identify the importance of conductors and explain the types of conductors.

## Description

Review of the National Electrical Code and preparation for the California State Certification Test. Jobsite management, system testing, fiber optics; heating, air conditioning, and refrigeration systems.

## Course Objectives

The student will be able to:

- Understand National Electric Code (NEC) definitions.
- Understand the various apprentice roles at the job site.
- Effectively test wires and cables pre- and post-installation.
- Install fiber optics cables and associated hardware using proper tools.
- Understand operations for HVAC and refrigeration systems.

## Course Content

- National Electrical Code
  - General definitions
  - Wiring and protection
  - Wiring methods and materials
  - Equipment for general use
  - Tables
- Jobsite Management
  - Coordinating tool needs with office of other jobs
  - Coordinating schedule with other crafts

- Developing timetables and progress charts
  - Completing time sheets, logs and other necessary documentation
  - Clearances or permits if necessary
  - Inventory and other necessary equipment according to job needs
  - Developing alternative solutions and choose the best alternative
  - Planning and organizing tasks to meet deadlines
  - Supervising and monitoring others
  - Picturing the way the project will appear when completed
- C. Testing

- Steps used for various testing processes
  - Acceptance testing of cables
  - Maintenance testing of generators
  - Insulation tests using megohmmeter
  - Utilizing the results of testing procedures
  - Special requirements for high voltage testing
  - Describe potential safety hazards
  - Characteristics and properties of high voltage cable and insulators
  - Appropriate tests, methods, voltages, and equipment
- D. Fiber Optic Systems
- Functions, operation and characteristics of fiber optic cable
  - Proper installation techniques
  - Minimum bend radius
  - Pulling techniques
  - Installation hardware
  - Splicing and termination
  - Utilize appropriate manuals and equipment to perform system tests and troubleshooting
- E. Heating, Air Conditioning and Refrigeration Systems
- The function, operation and characteristics of heating, air conditioning and refrigeration systems
  - Utilize appropriate manuals and equipment to perform system test and troubleshooting

## Lab Content

- Test of fiber optic cables.
- Demonstration of job site management and logistics.

## 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 for the Electrical Industry. Student Workbook-A5SWK. 2017.

National Fire Protection Association. National Electrical Code. 2017.

National Joint Apprenticeship and Training Committee for the Electrical Industry. Air Conditioning and Refrigeration. 2012.

National Joint Apprenticeship and Training Committee for the Electrical Industry. Configuring & Installing Structured Wiring Systems. 2017.

National Joint Apprenticeship and Training Committee for the Electrical Industry. Fundamentals of Instrumentation and More. 2011.

Dunning, Gary. Introduction to Programmable Logic Controllers. 2011.

National Joint Apprenticeship and Training Committee for the Electrical Industry. Fire Alarms. 2019.

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

- A. Read Chapters 1-5 in the "Air Conditioning and Refrigeration" workbook. Review the basics of an air conditioning and refrigeration system.
- B. Read Chapters 17-20 in the "Air Conditioning and Refrigeration" workbook. Review each section on the appropriate manuals and equipment to perform system test and troubleshooting.
- C. Write article on important safety considerations at the job site per the National Fire Protection Association, NEC 2011. NFPA 70: National Electrical Code.

## Discipline(s)

Electricity