APEL 113: RESIDENTIAL ELECTRICAL SYSTEMS: BASIC SECURITY, SOLAR POWER, HOME AUTOMATION & LIFE SAFETY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
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 113.
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 describe the components in a residential life safety system.
- A student will be able to identify the parts in a residential electrical system.

Description

A study of residential electrical systems and installation practices. Home automation, including home theater. Fundamentals of solar power systems and recommended practices. Life safety systems. Expanded study of the National Electrical Code as it relates to communication circuits, and water applications, such as pools and fountains.

Course Objectives

The student will be able to:

1. Demonstrate proficiency in setting up a basic security system
2. Demonstrate proficiency in wiring a home automation system
3. Explain the recommended practices of solar power systems
4. Diagram a lighting protection system

Course Content

1. Basic security systems
   a. Magnetic contacts
   b. Motion detectors
   c. Glassbreak sensors
   d. National Electric Code (NEC)
2. Home automation systems
   a. Home theater and video
   b. Video
   c. Pool, fountains, and similar locations
   d. Communication circuits
3. Solar power systems
   a. Preparation for solar systems
   b. Recommended practices
4. Light protection systems
   a. Fire alarms and smoke detectors
   b. Lighting protection and automated lighting controls

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:

1. Equipment safety
2. Fire protection
3. Electrostatic discharge (ESD)
4. 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

American Technical Publishers. Motors. 2010.

American Technical Publishers. Transformer Principles and Applications. 2012.

Dunlop, James. Photovoltaic Systems. 2012.

National Fire Protection Association. National Electrical Code. 2019.

National Joint Apprenticeship and Training Committee for the Electrical Industry. Conduit Bending and Fabrication. 2009.

Simmons, Phil, and Ray Mullin. Electrical Wiring Residential, 20th ed.. 2020.

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

1. Weekly reading assignments from text and outside sources
2. Weekly lecture covering subject matter from text assignment with extended topic information
3. Weekly lab exercises; each lab exercise may include individual or group participation

Discipline(s)

Electricity