

**PALOMAR COLLEGE**  
**COURSE OUTLINE OF RECORD FOR**  
**DEGREE CREDIT COURSE**

\_\_x\_\_ Transfer course    \_\_x\_\_ A.A. degree applicable course  
(check all that apply)

**COURSE NUMBER AND TITLE:** AP EL 104 – Electrical Lineperson IV

**UNIT VALUE:** 4

**MINIMUM NUMBER OF SEMESTER HOURS:** 72

**BASIC SKILLS REQUIREMENTS:** Appropriate language and computational skills.

**ENTRANCE REQUIREMENTS**

**PREREQUISITE:** AP EL 103.

**COREQUISITE:** None.

**RECOMMENDED PREPARATION:** None.

**SCOPE OF COURSE:**

Instruction in maintenance line distribution and underground line maintenance.

**SPECIFIC COURSE OBJECTIVES:**

The student will be able to:

1. Practice standard safety procedures appropriate to the power utility industry.
2. Recognize and deal appropriately with hazardous materials in the power utility industry.
3. Operate and maintain a bucket truck, digger derrick, backhoe, and trencher.
4. Demonstrate the proper method(s) of connecting pole top transformers (single-phase and three-phase).
5. Analyze and explain the proper procedures for troubleshooting and replacement of faulty pole top transformer components; i.e., cutouts, switches, capacitors, and voltage regulators.
6. Describe and identify basic overhead distribution design systems (delta and wye).
7. Explain the proper procedures in locating cable fault sites.
8. Identify and describe the maintenance procedures associated with underground system transformers, switchgear, and cables.

## **CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:**

- I. Rules and Regulations
  - A. Safety procedures (OSHA/Imperial Irrigation District)
  - B. Identifying and dealing with hazardous materials
  
- II. Line Trucks, Derricks, and Digging Equipment
  - A. Introduction to mobile hydraulic systems
  - B. Introduction to bucket trucks
  - C. Pre-use inspection
  - D. Bucket truck placement
  - E. Bucket truck operation
  - F. Material handling bucket trucks
  - G. Lifting a transformer
  - H. Lifting conductors
  - I. Digger derricks
  - J. Backhoes
  - K. Trenchers
  
- III. Distribution Line Maintenance II – Pole Top Equipment Maintenance
  - A. Overhead distribution system design (delta and wye)
  - B. Transformer connections (single and three-phase)
  - C. Troubleshooting transformers (single and three-phase)
  - D. Pole top transformer replacement
  - E. Troubleshooting and replacing
    - 1. Cutouts
    - 2. Switches
    - 3. Sectionalizers and reclosers
    - 4. Capacitors
    - 5. Voltage regulators
  
- IV. Underground Line Maintenance II – Transformers, Switchgear, and Cable Fault Location
  - A. Underground residential distribution transformers
  - B. Pad-mounted transformers and switchgear
  - C. Cable fault location

### **REQUIRED READING:**

Electrical Lineman Training Committee. Imperial Irrigation District's Lineman Apprenticeship Training Handbook. Imperial, CA: Imperial Irrigation District, 1990.

### **SUGGESTED READING:**

Kurtz, Edwin D., and Thomas M. Shoemaker. The Lineman and Cableman's Handbook. 8<sup>th</sup> edition. New York: McGraw-Hill, 1992.

### **REQUIRED WRITING:**

Written homework assignments consisting of nine to ten pages in length, which involve problem-solving analyzation in construction measurements.

**OUTSIDE ASSIGNMENTS:**

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

Outside class assignments will include reading assigned textbooks, handouts, completion of exercises, periodic research, and critiquing and analyzing problems.

**INSTRUCTIONAL METHODOLOGY:**

Check all that apply:

- lecture
- laboratory
- lecture-laboratory combination
- directed study

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes  No

If yes, check all that apply.

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

**GRADING POLICY AND STANDARDS** (include methods of determining whether the stated objectives have been met by students):

Augmented with a performance review to determine if all course objectives have been met -

Class Participation	20%	A = 100-90
Homework	20%	B = 89-80
Laboratory	20%	C = 79-70
Quizzes	20%	F = Below 70
Pre-test/Final exam	<u>20%</u>	
	100%	

**IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?**

Yes  No  Number of times course may be taken for credit: 2

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable: 58161 Part C 2A

**CONTACT PERSON:** Director, Vocational Programs, Ext. 2286

**SIGNATURES:**

SIGNATURES ON FILE