College of San Mateo
Course Outline

☒ New Course
☐ Update/No change
☐ Course Revision (Minor)
☐ Course Revision (Major)

Date: 06/02/08

Department: ELEL **Number:** 736

Course Title: Electrical Apprenticeship VI **Units:** 1.5

Total Semester Hours: **Lecture:** 0.0 **Lab:** 90.0 **Homework:** 0.0 **By Arrangement:** 0.0

Length of Course

☐ Semester-long
☒ Short course (Number of weeks 15)
☐ Open entry/Open exit

Grading

☒ Letter
☐ Pass/No Pass
☐ Grade Option (letter or Pass/No Pass)

1. **Prerequisite** (Attach Enrollment Limitation Validation Form.)

Indenture in the Electrical Apprenticeship Inside Wireman Program, approved by the California State Division of Apprenticeship Standards.

2. **Corequisite** (Attach Enrollment Limitation Validation Form.)

None

3. **Recommended Preparation** (Attach Enrollment Validation Form.)

None

4. **Catalog Description** (Include prerequisites/corequisites/recommended preparation.)

736 Electrical Apprenticeship VI (1.5)
(Formerly ELEL 706) 90 lab hours per semester. Prerequisite: Indenture in the Electrical Apprenticeship Inside Wireman Program, approved by the California State Division of Apprenticeship Standards. Second half of year three of a five-year Electrical Apprenticeship Program. Grounding and bonding, grounding electrode system, ground faults and short circuits, grounding and bonding equipment, three-phase transformers, overcurrents.

5. **Class Schedule Description** (Include prerequisites/corequisites/recommended preparation.)

736 Electrical Apprenticeship VI
Second half of year three of a five-year Electrical Apprenticeship Program. Grounding and bonding, grounding electrode system, ground faults and short circuits, grounding and bonding equipment, three-phase transformers, overcurrents. Formerly ELEL 706. Prerequisite: Indenture in the Electrical Apprenticeship Inside Wireman Program, approved by the California State Division of Apprenticeship Standards.

6. **Student Learning Outcomes** (Identify 1-6 expected learner outcomes using active verbs.)

Upon successful completion of the course, the student will be able to:

Recognize and apply NEC for grounding, bonding, transformers, overcurrents

7. **Course Objectives** (Identify specific teaching objectives detailing course content and activities. *For some courses, the course objectives will be the same as the student learning outcomes. If this is the case, please simply indicate this in this section).*

Apply the knowledge and skills necessary to perform the job assignments expected of a third year inside wireman apprentice.

8. **Course Content** (Brief but complete topical outline of the course that includes major subject areas [1-2 pages]. Should reflect all course objectives listed above. In addition, you may attach a sample course syllabus with a timeline.)

See Attached Topical Outline

9. **Representative Instructional Methods** (Describe instructor-initiated teaching strategies that will assist students in meeting course objectives. Include examples of out-of-class assignments, required reading and writing assignments, and methods for teaching critical thinking skills.) **If hours by arrangement are required by this course, indicate the additional instructional activity which will be provided during this time.**

Reading Assignments
Workbook Lab Assignments

10. **Representative Methods of Evaluation** (Describe measurement of student progress toward course objectives. Courses with required writing component and/or problem-solving emphasis must reflect critical thinking component. If skills class, then applied skills.)

Completion of lab homework
Examination upon completion of each unit
Demonstrated competency by successful completion of lab assignments

11. **Representative Text Materials** (With few exceptions, texts need to be current. Include publication dates.)

See Attached List

Prepared by: _____
(Signature)

Email address: schneider@smccd.edu

Submission Date: _____

I. Grounding and Bonding Fundamentals
   A. Understand the Attributes of AC Systems
   B. Understand the Attributes of Electrical Services
   C. Understand the NEC Requirements for System Grounding

II. Understand and Applying Grounding Electrode System
   A. Understand the Attributes of the Grounding Electrode Conductor
   B. Understand the Equipment Grounding Conductors
   C. Understand the Enclosure and Equipment Grounding

III. Understand the Attributes of Ground Faults and Short Circuits
   A. Understand and Analysis Separately Derived Systems
   B. Understand the Attributes of Ground Fault Protection of Equipment
   C. Understand the Method for Grounding at Separate Buildings

IV. Understand Requirements for Grounding and Bonding Electronic Equipment
   A. Understand Grounding and Bonding Low Voltage Systems
   B. Understand and Apply NEC Article 250
   C. Understand the Principles and Methods for Earth Testing

V. Understand and Review Three-Phase Transformers
   A. Review Methods for Connections to WYE and DELTA Three-Phase Transformers
   B. Review Methods for Three-Phase Buck-Boost Transformers

VI. Understand and Apply NEC for Grounding, Bonding, Transformers, Overcurrents
   A. Understand and Analysis Types of Overcurrent Protection Devices (OCPD)
   B. Understand and Apply Branch Circuit OCPD
   C. Understand and Apply Transformer Protection
   D. Understand and Apply Ground Fault Protection

Representative Text Materials – ELEL 736

International Association of Electrical Inspectors. Soares Book on Grounding, 9"' Edition. Richardson, Texas: International Association of Electrical Inspectors Press, 2004.

Mazur, Glen A. Test Instruments Applications Manual. Homewood, Illinois. American Technical Publishers, Inc., 2006

Mazur, Glen A. Test Instruments Textbook. Homewood, Illinois. American Technical Publishers, Inc., 2006

National Fire Protection Associates, Inc. National Electric Code 2005. Quincy, Massachusetts: NFPA, 2004.

National Joint Apprenticeship and Training Committee. Codes and Practices Workbook 3. Upper Marlboro, Maryland: NJATC Press, 2005.

National Joint Apprenticeship and Training Committee. Electrical Safety-Related Work Practices Textbook. Upper Marlboro, Maryland: NJATC Press, 2005.

National Joint Apprenticeship and Training Committee. Electrical Safety-Related Work Practices Workbook. Upper Marlboro, Maryland: NJATC Press, 2005.

National Joint Apprenticeship and Training Committee. Grounding Workbook. Upper Marlboro, Maryland: NJATC Press, 2005.

National Joint Apprenticeship and Training Committee. Test Instruments Workbook. Upper Marlboro, Maryland: NJATC Press, 2005.

National Joint Apprenticeship and Training Committee. Transformers Workbook. Upper Marlboro, Maryland: NJATC Press, 2005.

Shultz, George P. Transformers and Motors. Wiborn, Massachusetts: Butterworth-Heinemann, 1989