APED 220.9 Course Outline as of Fall 2022

CATALOG INFORMATION

Dept and Nbr: APED 220.9 Title: APP ELECTRICIANS 9TH SEM
Full Title: Apprentice Electricians, Ninth Semester
Last Reviewed: 3/28/2022

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	0	4	Lab Scheduled	0
		Contact DHR	3.00		Contact DHR	52.50
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 210.00

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	APED 260I

Catalog Description:
Students will be introduced to training related to electrician indentured apprenticeship. This is the ninth semester of a ten-semester program.

Prerequisites/Corequisites:

Recommended Preparation:
Course Completion of APED 220.8

Limits on Enrollment:
Indentured apprentice - apply and be accepted by the Redwood Empire Joint Apprenticeship & Training Committee (REJATC)

Schedule of Classes Information:
Description: Students will be introduced to training related to electrician indentured apprenticeship. This is the ninth semester of a ten-semester program. (Grade Only)
Prerequisites/Corequisites:
Recommended: Course Completion of APED 220.8
Limits on Enrollment: Indentured apprentice - apply and be accepted by the Redwood Empire Joint Apprenticeship & Training Committee (REJATC)

Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**	Effective:	Inactive:
CSU GE:	**Transfer Area**	Effective:	Inactive:
IGETC:	**Transfer Area**	Effective:	Inactive:

CSU Transfer:	Effective:	Inactive:
UC Transfer:	Effective:	Inactive:

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe and demonstrate electrical principles and regulations related to electricians' trade.
2. Apply best practices in practical environment related to electricians' trade.

Objectives:
At the conclusion of this course, the student should be able to:
1. Relate the available national electrical resources to responsibilities, privileges, and employment opportunities.
2. Demonstrate a working understanding of torque theory, products, and components.
3. Identify and explain fire alarm devices, appliances, functions, and systems.
4. Demonstrate the ability to work with fire alarm plans, specifications, inspection, testing, and maintenance
5. Describe and demonstrate knowledge, functions, and applications for Direct Current (DC) motor control devices, components, and systems.
6. Describe and demonstrate knowledge of electric vehicle code, equipment, and load calculations.
7. Explain and demonstrate best practices of electrical service installations.
8. Demonstrate a knowledge of Instrumentation theory, principles, and device applied functions.

Topics and Scope:

I. Orientation, Level III
   A. The National Electrical Benefit Fund (NEBF)
   B. Keys to success-motivation and leadership
   C. The National Labor Relations Board
   D. The economics of unemployment
   E. The realities of construction
II. Torque, Level I
   A. Torque theory

- B. Threaded fasteners basics
- C. Introduction to torque applications
- D. Torque products
- E. Real world electrical torque applications

III. Fire Alarm Systems, Level I, Based on the Current National Electrical Code (NEC)
- A. Introduction to fire alarm systems
- B. Fundamentals and system requirements
- C. Initiating devices
- D. Notification appliances
- E. Wiring and wiring methods
- F. System interfaces and safety control functions
- G. Emergency communications systems and emergency voice/alarm communications aystems
- H. Plans and specifications

IV. Fire Alarm Systems, Level II, Based on the Current NEC
- A. Advanced detection topics
- B. Public emergency alarm reporting systems and supervising stations
- C. Single- and multiple-station alarms and household fire alarm systems
- D. Inspection, testing, and maintenance

V. Motor Control, Level III
- A. DC motor control
- B. Understanding analog signals
- C. Analog pilot devices
- D. Working with Solid-State devices in motor control
- E. Variable frequency drives
- F. Programmable logic controllers
- G. Controlling synchronous, stepper, and servo motors
- H. Networked motor control
- I. Troubleshooting electrical systems

VI. Electric Vehicle Charging Systems (EVCS-17), Based on the Current NEC
- A. Electric vehicles
- B. Electric vehicle charging equipment
- C. The 2017 NEC
- D. Advanced load calculations
- E. Site assessment
- F. Commissioning
- G. Troubleshooting

VII. Code, Standards, and Practices, Based on the Current NEC
- A. Installing electrical services
- B. Swimming pools, fountains, and similar installations
- C. Understanding emergency and standby systems installation requirements
- D. Over 1,000-Volt installations
- E. Remote-Control, signaling, and power-limited circuits
- F. 2020 NEC changes – Part I
- G. 2020 NEC changes – Part II

VIII. Instrumentation Introduction - Module 1
- A. Math
- B. Science
- C. Electrical theory
- D. Meters and measurements
- E. Instrumentation vocabulary
- F. Process and instrumentation diagram interpretation

Assignment:

1. Homework assignments (1-2 sets per week)
2. Quizzes and examinations (4-6 per semester)
3. Class performances and field work (on-the-job demonstrations) of skill development, safety practices, equipment, and material handling

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework assignments; field work	Problem solving 10 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances; field work	Skill Demonstrations 50 - 65%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes and examinations	Exams 10 - 20%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation	Other Category 5 - 10%

Representative Textbooks and Materials:
Fire Alarm Textbook Catalog Order No: S946 in the Electrical Training Alliance 2020 Training Essentials Catalog. National Joint Apprenticeship and Training Committee for the Electrical Industry. 2020
National Fire Protection Association 70 National Electrical Code - 2020 Handbook Catalog Order No: S1050 in the Electrical Training Alliance 2020 Training Essentials Catalog. Delmar Cengage Learning. 2020
National Fire Protection Association (NFPA) 70 National Electrical Code (NEC) - 2017 Handbook Catalog Order No: S950 in the Electrical Training Alliance 2020 Training Essentials Catalog. Delmar Cengage Learning. 2017
Code Calculations Textbook Catalog Order No: S00820 in the Electrical Training Alliance 2020

Training Essentials Catalog. National Joint Apprenticeship and Training Committee for the Electrical Industry. 2020

Significant Changes to the NEC-2020 Catalog Order No: S1053 in the Electrical Training Alliance 2020 Training Essentials Catalog. National Joint Apprenticeship and Training Committee for the Electrical Industry. 2020