

**APED 221.5 Course Outline as of Fall 2019****CATALOG INFORMATION**

Dept and Nbr: APED 221.5 Title: RESIDENTIAL WIRING 5  
 Full Title: Electrician Apprentice Residential Wiring, 5th Semester  
 Last Reviewed: 2/11/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.50	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.50	Lab Scheduled	1.50	6	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	4.50		Contact Total	78.75
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 183.75

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 274

**Catalog Description:**

This course continues the instruction for residential wiring for electrician indentured apprentices. This is the fifth semester of a six semester program.

**Prerequisites/Corequisites:**

Course Completion of APED 221.4 ( or APED 273)

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: This course continues the instruction for residential wiring for electrician indentured apprentices. This is the fifth semester of a six semester program. (Grade Only)

Prerequisites/Corequisites: Course Completion of APED 221.4 ( or APED 273)

Recommended:

Limits on Enrollment:

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:**

Not Certificate/Major Applicable

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Describe the difference between AC and DC circuits.
2. Calculate electrical load
3. Install sound systems
4. Analyze air conditioning and refrigeration system controls

### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Demonstrate, utilize, and describe AC and DC theory.
2. Evaluate and illustrate power quality and harmonics.
3. Identify, use, and analyze proper fuse application.
4. Calculate and interpret electrical load.
5. Demonstrate, diagram, and describe basic telephone wiring.
6. Describe, differentiate, and summarize analog systems and digital systems.
7. Illustrate, utilize, and interpret residential connections.
8. Recognize, identify, and demonstrate installation of sound systems.
9. Demonstrate, employ, and analyze air conditioning and refrigeration controls.
10. List, explain, and install two-wire motor controls.

### **Topics and Scope:**

#### **I. AC and DC Theory**

A. AC theory

B. DC theory

C. Review of series and parallel circuits

D. Review of series and parallel resistive load circuits

E. Review of series and parallel resistive current circuits

F. Review of series and parallel resistive line current circuits

G. Combination resistive line current circuits

#### **II. Power Quality and Harmonics**

A. Review of topics such as Ohm's law related to resistance computation

- B. Relationship of harmonics to power quality
- III. Fuses
  - A. Over-current protection
  - B. Application of fuses
  - C. Circuit breakers
  - D. Short-circuit calculations
  - E. Parameters of electrical component protection
- IV. Electrical Load
  - A. Introduction to calculation of electrical load
  - B. Parameters of residential load according to National Electrical Code
  - C. Parameters of load for multifamily dwellings
- V. Telephone Wiring
  - A. Components of telephone systems
  - B. Telephone circuitry
  - C. Telephone wiring
- VI. Analog and Digital Systems
  - A. Components and design
  - B. Review of analog and digital operations
  - C. Uses of analog and digital
- VII. Residential Networking
  - A. Components
  - B. Installation
  - C. Cable standards according to the NEC
- VIII. Sound Systems
  - A. Components
  - B. Installation
- IX. Air Conditioning and Refrigeration Controls
  - A. Components and theory of air conditioning and refrigeration
  - B. Control basics
  - C. Troubleshooting
- X. Two-Wire Motor Controls
  - A. Introduction to motors
  - B. Theory and construction
  - C. Installation
  - D. Fractional horsepower motors
  - E. Motor control drawings
  - F. Controllers

All topics covered in both the lecture and lab portions of the course.

**Assignment:**

Field assignments include:

1. Field work

Classroom and homework assignments include:

1. Homework problems
2. Quizzes (2 - 20)
3. Final examination
4. Reading assignments to be completed between class meetings

Laboratory performance assignments include:

1. Demonstrations
2. Practice skills in electricity
3. Implement safety practices
4. Practice proper use of equipment and materials
5. Employ proper techniques in wiring of circuits and control devices
6. Utilizing testing and measuring equipment properly
7. Lab reports

**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 problems, Lab reports

Problem solving  
25 - 40%

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

Class performances, Performance exams, Field work

Skill Demonstrations  
30 - 45%

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

Quizzes and examinations

Exams  
15 - 30%

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

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

Residential Syllabus 3rd Year. NJATC. NJAT. Item number J208R3.N or most current  
 Inside Job Information-4 SW. NJATC. NJAT. Item number J224SW or most current  
 Photovoltaic Systems SW. NJATC. NJAT. Item number 4230SW.J or most current  
 Residential Advanced Tech SW. NJATC. NJAT. Item number J275SW or most current  
 Residential Fire Alarm & Security System SW. NJATC. NJAT. Item number J296SW or most current  
 Residential Plan & Design SW. NJATC. NJAT. Item number J294SW or most current  
 Telephone and Security Basics SW. NJATC. NJAT. Item number J226SW.H or most current  
 Residential 3rd Yr SW Kit. NJATC. NJAT. Item number R3SWK17 or most current

Inside Job Information-4 IG. NJATC. NJAT. Item number J224IG or most current  
Photovoltaic Systems IG. NJATC. NJAT. Item number J230IG.J or most current  
Residential Advanced Tech IG. NJATC. NJAT. Item number J275IG or most current  
Residential Fire Alarm & Security Systems IG. NJATC. NJAT. Item number J296IG or most current  
Residential Plan & Design IG. NJATC. NJAT. Item number J294IG or most current  
Telephone and Security Basics IG. NJATC. NJAT. Item number J226IG or most current  
Orientation IG. NJATC. NJAT. Item number J200IG.I or most current  
Residential Motors & Transformers IG. NJATC. NJAT. Item number J291IG or most current  
Residential Wiring Practices IG. NJATC. NJAT. Item number J292IG.J or most current  
Residential Code-2 IG. NJATC. NJAT. Item number J293IG.J or most current  
Residential Job Information-2 IG. NJATC. NJAT. Item number J255IG or most current  
Residential 3rd Yr IG Kit. NJATC. NJAT. Item number R3IGK17 or most current

Automating and Integrating Residential Systems. NJATC. NJAT. Item number S486 or most current  
Harris Handbook on Basic Telephony. NJATC. NJAT. Item number S281 or most current  
Photovoltaic Systems. NJATC. NJAT. Item number S674 or most current  
Residential Security, Surveillance, and Access Systems. NJATC. NJAT. Item number S483 or most current  
Residential Audio & Video Systems. NJATC. NJAT. Item number S484 or most current  
Residential Cabling Technologies. NJATC. NJAT. Item number S485 or most current  
Residential Fire Alarm and Carbon Monoxide Systems. NJATC. NJAT. Item number S488 or most current  
Electrical Wiring Residential. NJATC. NJAT. Item number S03914 or most current  
Electrical Systems 2017 NEC. NJATC. NJAT. Item number S970 or most current  
Transformers & Motors. NJATC. NJAT. Item number S018 or most current  
Residential 3rd Yr SW Kit Complete. NJATC. NJAT. Item number R3SWKC17 or most current  
Residential 3rd Yr IG Kit Complete. NJATC. NJAT. Item number R3IGKC17 or most current  
Residential Course Presentation. NJATC. NJAT. Item number RCP3K14 or most current