

## Instructional/Task Analysis

### Related Information: What the Student Should Know

### Application: What the Student Should Be Able to Do

#### Unit 1: Blueprint Reading and Load Calculations

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|---|---|
| 1. Terms and definitions                                  | 8. Draw receptacle and lighting outlets on a floor plan                 |
| 2. Blueprint symbols                                      | 9. Determine general lighting loads                                     |
| 3. Electrical symbols                                     | 10. Determine small appliance and laundry loads                         |
| 4. Types of lines   | 11. Determine total connected load plus total demand load of a dwelling |
| 5. Information commonly found in blueprint specifications | 12. Locate required receptacle and lighting outlets on a house plan     |
| 6. Minimum requirements for residential outlets           |   |
| 7. Calculating circuit loads and voltage drop             |   |

#### Unit 2: Service

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| 1. Terms and definitions   | 10. Calculate service size and minimum number of circuits                            |
| 2. Clearances for service drop conductors                            | 11. Install an overhead raceway with service entrance conductors to a meter base     |
| 3. Service disconnects   | 12. Connect meter base assembly to load center or panel                              |
| 4. Facts that should be known before service installation is started | 13. Install an underground service (lateral) raceway with conductors to a meter base |
| 5. Parts of a service entrance                                       | 14. Braid the ground conductor of a service entrance cable                           |
| 6. Types of grounding electrodes                                     |  |
| 7. Grounding electrode conductor installations and sizes             |  |
| 8. Short circuit protection at service equipment                     |  |
| 9. Surge protection  |  |

#### Unit 3: Rough-In

1. Terms and definitions
2. Locations where at least one receptacle outlet is required
3. Planning techniques when placing boxes on plans
4. Accepted heights for boxes in various locations

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### Unit 3: Rough-In (continued)

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| 5. Procedure for installing boxes in exterior walls                | 12. List systems that must be installed in a residence prior to installing the finish.                |
| 6. Box extensions for noncombustible and combustible wall surfaces | 13. Locate receptacle, switch, and lighting outlets along a floor line and the ceiling on a blueprint |
| 7. Common methods of finding room centers                          | 14. Locate receptacle outlets along kitchen cabinets  |
| 8. Required outlets  | 15. Locate receptacle outlets in a bathroom   |
| 9. Locations requiring GFCI protection                             |   |
| 10. Location requiring AFCI protection                             |   |
| 11. Rules for electrical installations                             |   |

### Unit 4: Trim Out and Troubleshooting

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| 1. Terms and definitions                                | 12. List and price lighting fixtures   |
| 2. Common residential receptacle types and cover plates | 13. Troubleshoot electrical problems   |
| 3. Common residential switch types and cover plates     | 14. Wire a receptacle fed from a lighting outlet through a single pole switch            |
| 4. Common residential fixture locations                 | 15. Wire a switch controlled split-wired receptacle                                      |
| 5. Appliance classifications                            | 16. Wire a receptacle fed from a lighting outlet through a three-way switch              |
| 6. Requirements for appliance disconnect means          | 17. Wire a four-way switching situation with the supply entering the lighting outlet box |
| 7. Grounding requirements for appliances                | 18. Mount a fan box according to manufacturer's recommendations                          |
| 8. Parts of a duplex grounding type receptacle          | 19. Install a range or dryer receptacle  |
| 9. Parts of an equipment grounding system               | 20. Connect a supply cord to a free standing range or dryer                              |
| 10. Steps for panel trim out                            | 21. Install a fixed appliance equipped with a pigtail to a branch circuit                |
| 11. Troubleshooting procedures                          | 22. Install a multi-circuit split-wired duplex grounding type receptacle                 |
|   | 23. Install a fusible safety switch for an air-conditioning condenser                    |

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#### Unit 5: Low Voltage Wiring

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|--|---|
| 1. Terms and definitions   | 13. List licensing requirements for low voltage wiring systems  |
| 2. Requirements of low voltage lighting systems                                | 14. List uses of low voltage cable  |
| 3. Parts of a low voltage lighting system                                      | 15. Draw a wiring diagram indicating the proper connections for a single smoke detector and interconnecting smoke detectors |
| 4. Process that takes place during a low voltage lighting circuit off/on cycle | 16. Wire a two-button chime circuit   |
| 5. Components and operation of a door bell chime circuit                       | 17. Wire two interconnecting telephone wall jacks   |
| 6. Manual fan switching circuit  | 18. Wire two interconnecting smoke detectors  |
| 7. Thermostat system switch in the cool position and the fan switch on auto    |   |
| 8. Thermostat system switch in the heat position and the fan switch on auto    |   |
| 9. Anticipator circuits on low voltage thermostats                             |   |
| 10. Communication circuits and their characteristics                           |   |
| 11. Smoke and fire alarm systems   |   |
| 12. Garage door opener operation   |   |

#### Unit 6: Home Automation

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| 1. Terms and definitions                  | 8. Use Article 780 of the <i>National Electrical Code</i> to answer questions related to home automation |
| 2. Definition of home automation          |  |
| 3. Operation of an automated home         |  |
| 4. Components of a home automation system |  |
| 5. Types of cable used in home automation |  |
| 6. Types of controllers                   |  |
| 7. Special tools used in home automation  |  |