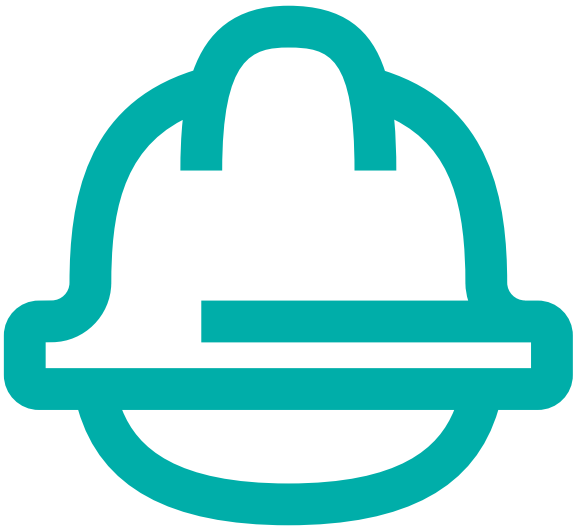
NOCTI

Teacher Credential Blueprint



Electrical Construction Technology

Code: 5291 / Version: 01

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General Assessment Information

Blueprint Contents

General Assessment Information
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Test Type: The Early Childhood Education and Care assessment is included in NOCTI's Teacher assessment battery. Teacher assessments measure an individual's technical knowledge and skills in a proctored proficiency examination format. These assessments are used in a large number of states as part of the teacher licensing and/or certification process, assessing competency in all aspects of a particular industry. NOCTI Teacher tests typically offer both a written and performance component that must be administered at a NOCTI-approved Area Test Center. Teacher assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from secondary, post-secondary, and business/industry representatives from the states of Georgia, Michigan, New York, Pennsylvania, Virginia, and West Virginia.

Content Review: A content review is an independent, comprehensive review by Subject Matter Experts to evaluate content accuracy, the currency of technical material, and relevance to current industry practices.

CIP Code

46.0399- Electrical and Power Transmission Installers, Other

Learning that works for America CTE™

Career Cluster 2- Architecture and Construction

O*NET™ in*it

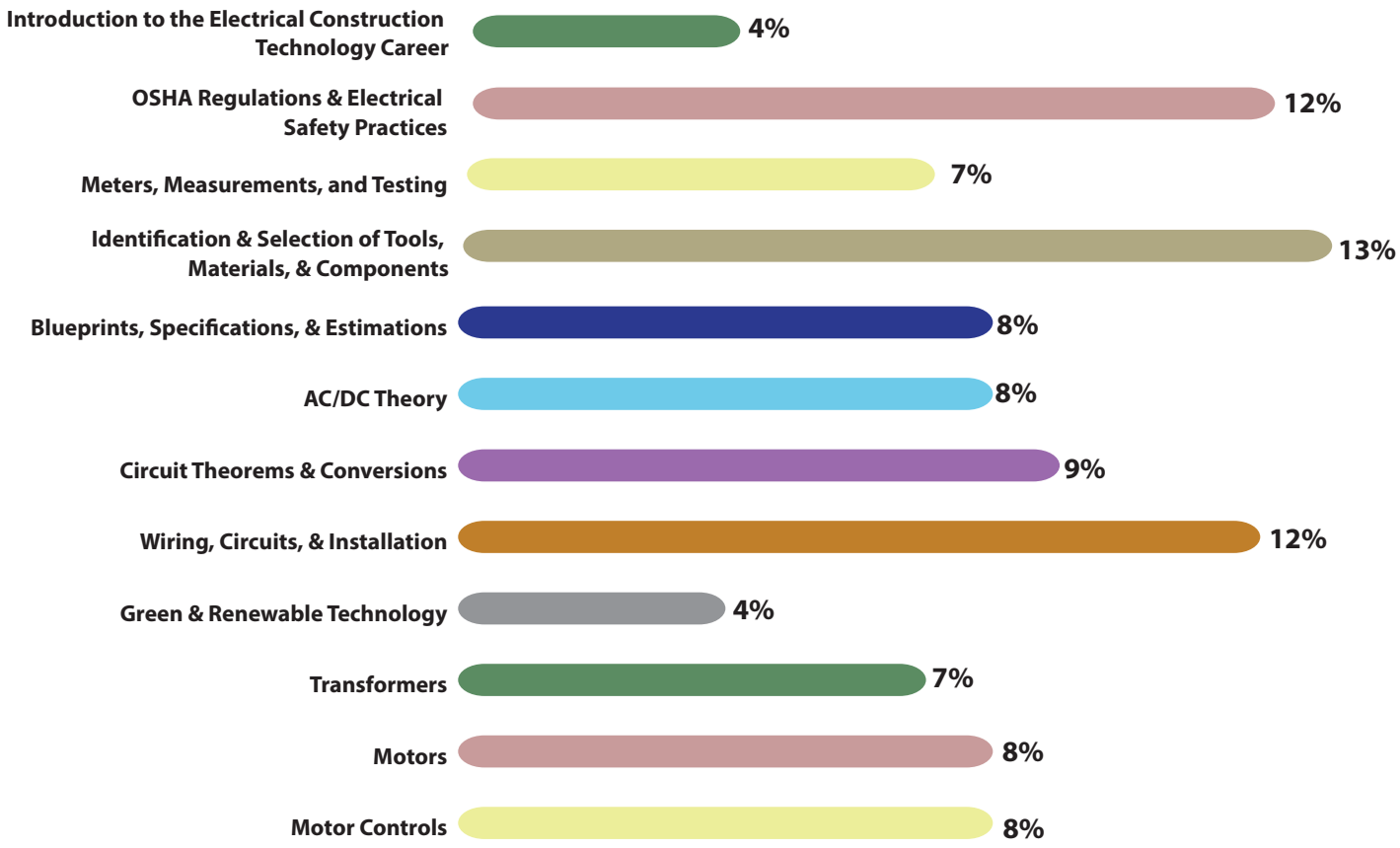
47-2111.00- Electricians

Written Assessment

NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours
Number of Questions: 168
Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included in this Assessment

Introduction to the Electrical Construction Technology Career

- Identify various electrical construction technology positions and responsibilities
- Identify career-related professional organizations and their purpose

OSHA Regulations and Electrical Safety Practices

- Identify proper use of personal protective equipment (PPE) according to NFPA 70E standards
- Explain the purpose of OSHA
- Identify procedures for fire, ladder, and environmental safety according to OSHA standards
- Identify procedures for lock-out/tag-out
- Explain basic first aid procedures

Meters, Measurements, and Testing

- Identify characteristics, uses, and connections of meters and measuring devices
- Identify meter safety procedures
- Interpret meter readings

Identification and Selection of Tools, Materials, and Components

- Identify and correctly use hand and power tools
- Identify and select proper conductor cable type
- Identify and select proper conduit, boxes, and fittings
- Identify the function and purpose of various specialty equipment, including Ground Fault Circuit Interrupter (GFCI) and Arc-Fault Circuit Interrupter (AFCI)
- Identify commonly used listed and labeled equipment (UL or CSA)

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Specific Standards and Competencies (continued)

Blueprints, Specifications, and Estimations

- Identify and interpret electrical symbols and specifications in blueprints and plans
- Identify and interpret wiring and schematic diagrams
- Demonstrate planning and layout of a circuit

AC/DC Theory

- Identify characteristics of AC circuits
- Explain amperage, power, voltage, and resistance
- Identify materials as insulators, conductors, and semi-conductors
- Identify characteristics and components of DC circuits

Circuit Theorems and Conversions

- Identify and apply various circuit theorems, including Ohm's Law, Kirchhoff's Law, Watt's Law, and electron theory
- Identify and apply various mathematical conversions, including scientific, engineering, and notations/conversions (milliamps to amps; kilowatts to horsepower)

Wiring, Circuits, and Installation

- Explain the NEC and how it is organized
- Select appropriate wiring for specific installations (residential and commercial)
- Install various switching arrangements
- Install cabling, raceways, conduit, boxes, wiring, devices, and trims
- Test and troubleshoot completed installation

Green and Renewable Technology

- Discuss wind turbine, solar energy, and other renewable sources of energy
- Describe energy management devices (e.g., LED lighting, CFLs, occupancy sensors)

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Specific Standards and Competencies (continued)

Transformers

- Identify and calculate voltage/current for primary and secondary windings
- Determine KVA capacity of a single-phase and three-phase transformer
- Differentiate between Delta and Wye connections

Motors

- Describe operating characteristics of basic single-phase and three-phase induction motors
- Identify and connect motor connections per nameplate (three-phase and single-phase)
- Identify and interpret motor nameplate information (e.g., voltage and phases)

Motor Controls

- Explain basic operation of circuitry
- Test, troubleshoot, and reverse three-phase motor rotation
- Identify commonly used symbols in motor controls

Sample Questions

An apprentice electrician should

A. be supervised while on the job site
B. be pre-qualified to operate hand tools
C. hold a journeyman license
D. pass local standards electrical test

A ladder may be used in front of a door only if

A. no one is at home
B. no glass is present
C. the door is locked or blocked
D. it is the last fixture to hang

Measure electromotive force with a/an

A. ammeter
B. anemometer
C. galvanometer
D. voltmeter

AWG units are used to express conductor sizes and represent the

A. Associated Wire Gauge
B. American Wire Gauge
C. Absolute Wire Gauge
D. Approximate Wire Gauge

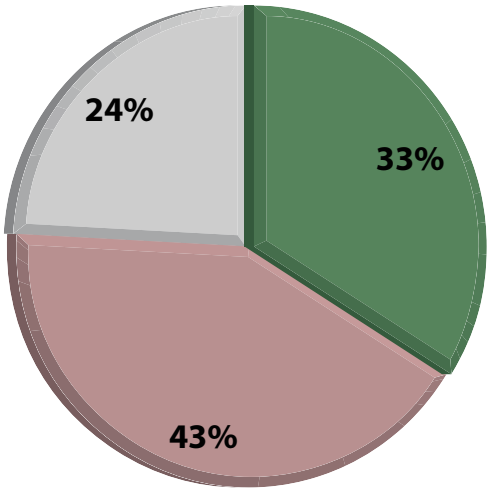
The symbol normally used for a single receptacle is a

A. circle with two parallel lines drawn through it
B. circle with one line drawn through it
C. square box with an X drawn inside
D. square box with the letter R next to it

Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 3 hours, 20 minutes
Number of Jobs: 3



Areas Covered:

33% Bend Conduit
Participant will safely install boxes onto the wall, and use proper bending and cutting techniques to install conduit.

43% Switching and GFCI Receptacle installation in a Residential Setting
Participant will properly mount boxes, install wiring and devices, and complete the job in a neat operational manner following safety standards.

24% Install Two Smoke Alarms in a Commercial Setting
Participant will install interconnected components to operate properly following safety standards.

Sample Job

Install Two Smoke Alarms in a Commercial Setting

Maximum Time: 1 hour

Participant Activity: The participant will install two smoke alarms in a commercial setting referring to the drawings provided, using MC 14-2 and 14-3 AWG, install two interconnected smoke alarms, use a separate circuit, and home run first smoke alarm; interconnect between the two smoke alarms.