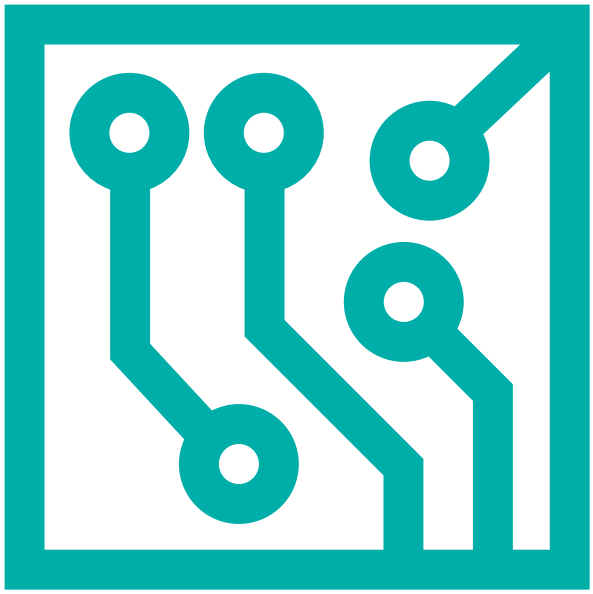
NOCTI

Job Ready Credential Blueprint



Electronics Technology

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General Assessment Information

Blueprint Contents

General Assessment Information
Written Assessment Information
Specific Competencies Covered in the Test
Sample Written Items
Performance Assessment Information
Sample Performance Job

Test Type: The Electronics Technology industry-based credential is included in NOCTI's Job Ready assessment battery. Job Ready assessments measure technical skills at the occupational level and include items which gauge factual and theoretical knowledge. Job Ready assessments typically offer both a written and performance component and can be used at the secondary and post-secondary levels. Job Ready 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 New Jersey, North Carolina, Ohio, and Pennsylvania.

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

15.0303- Electrical, Electronic and Communications Engineering Technology/Technician

Learning that works for America CTE™

Career Cluster 15- Science, Technology, Engineering, and Mathematics

O*net™ in*it

17-3023.01- Electronics Engineering Technicians

NATIONAL COLLEGE CREDIT RECOMMENDATION SERVICE
University of the State of New York - Regents Research Fund

3 semester hours in Electronics, Introduction to Electrical Engineering Technology or General Technology

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General Assessment Information (continued)

The Association for Career and Technical Education (ACTE), the leading professional organization for career and technical educators, commends all students who participate in career and technical education programs and choose to validate their educational attainment through rigorous technical assessments. In taking this assessment you demonstrate to your school, your parents and guardians, your future employers and yourself that you understand the concepts and knowledge needed to succeed in the workplace. Good Luck!

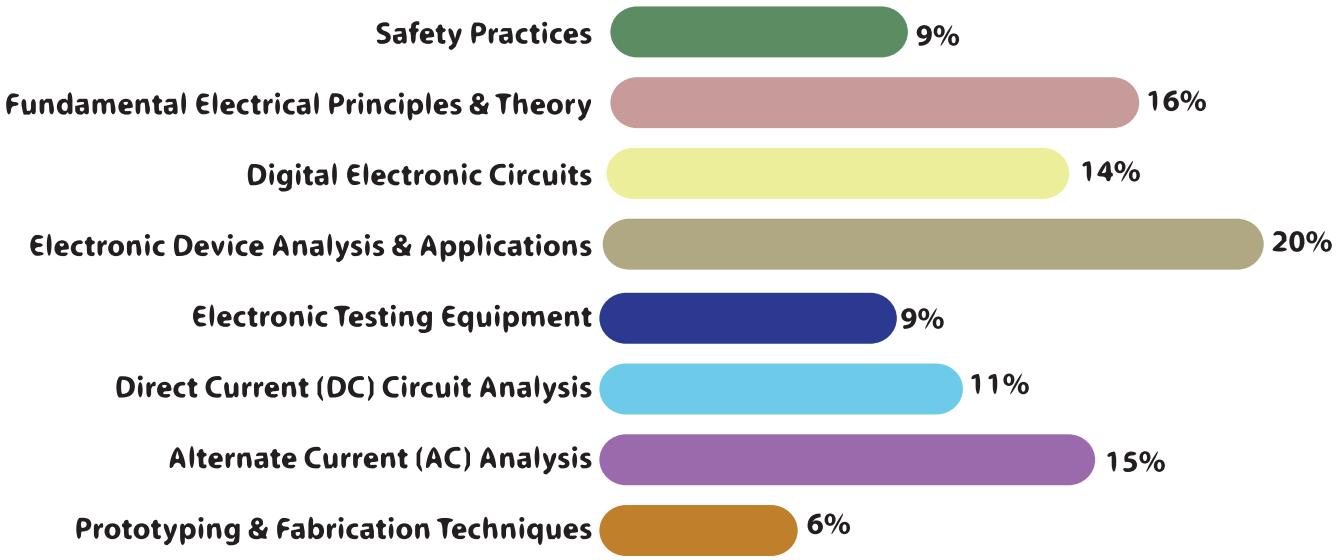
Electronics Technicians Association® International (ETA®) represents and supports electronics professionals with over 80 industry-recognized and accredited technical certifications. An ETA certification validates the technical knowledge and hands-on skills necessary to be successful in today's electronics industry. Employers worldwide choose ETA-certified professionals because of ETA's certification programs' competency criteria and testing benchmarks that conform to the highest international electronics standards. Students passing NOCTI assessments in the area of electronics, industrial electronics and electronics technology are prime candidates to achieve success earning ETA certifications and will be qualified to enter today's workforce. www.eta-i.org

Written Assessment

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

Administration Time: 3 hours
Number of Questions: 182
Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included in this Assessment

Safety Practices

- Demonstrate safe working procedures
- Explain the purpose of OSHA and how it promotes safety on the job
- Identify electrical hazards and how to avoid or minimize them in the workplace
- Explain safety issues concerning lockout/tagout procedures
- Safely discharge electronic equipment

Fundamental Electrical Principles and Theory

- Explain basic electrical theory, including Ohm's Law, Watt's Law, Kirchhoff's Law
- Describe magnetism and electromagnetism
- Identify schematic symbols
- Identify sources of electricity, including renewable sources
- Interpret component values
- Describe conductors, resistors, insulators, and semiconductors
- Apply proper engineering notations; SI and metric prefixes

Digital Electronic Circuits

- Identify and compare digital to analog signals and circuits
- Demonstrate knowledge of different number systems
- Convert between different number systems
- Demonstrate knowledge of fundamental logic gates and functions
- Demonstrate knowledge of Boolean logic
- Demonstrate knowledge of sequential logic (flip flops)
- Demonstrate knowledge of digital circuitry

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Specific Standards and Competencies (continued)

Electronic Device Analysis and Applications

- Identify diodes, rectifiers, and power supply circuits
- Identify bipolar transistors and bipolar transistor circuits
- Demonstrate knowledge of Field Effect Transistors (FETs) and FET circuits
- Demonstrate knowledge of thyristors and control circuits
- Identify optoelectronic devices and light functions
- Identify Op-Amps, principles, and applications
- Describe circuit protection methods including Electromagnetic Interference (EMI)
- Interpret a manufacturer's data sheet

Electronic Testing Equipment

- Identify, select, and demonstrate proper hand tool use
- Display knowledge and proper use of multimeters
- Display knowledge and proper use of oscilloscopes
- Display knowledge and proper use of function generators, frequency counters, and testers

Direct Current (DC) Circuit Analysis

- Analyze and troubleshoot DC series circuits
- Analyze and troubleshoot DC parallel circuits
- Demonstrate knowledge of inductors and capacitors in DC circuits
- Analyze and troubleshoot DC combination circuits

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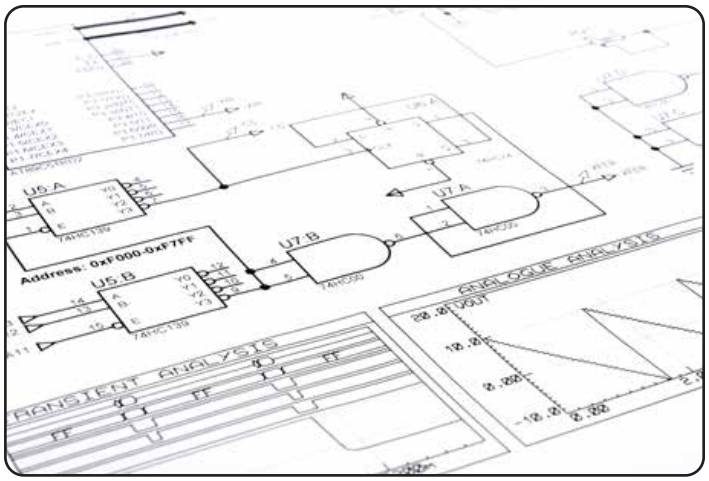
Specific Standards and Competencies (continued)

Alternating Current (AC) Analysis

- Analyze AC circuits and waveforms
- Troubleshoot an AC circuit
- Demonstrate knowledge of inductance, capacitance, and resonance
- Identify, analyze, and troubleshoot filter circuits
- Explain current and voltage phase relationships
- Describe the operation of transformers, including troubleshooting

Prototyping and Fabrication Techniques

- Layout components on a printed circuit board according to a schematic
- Demonstrate knowledge of proper soldering and de-soldering techniques
- Repair or replace a component or foil on a printed circuit board



Sample Questions

SDS stands for
A. Safety Data Sheet
B. Synchronization Dynamic Status
C. Series Data Strand
D. Source Dimensional Standard

Impedance is measured in
A. farads
B. joules
C. henries
D. ohms

The binary numbering system is base
A two
B. four
C. eight
D. ten

What does an FET do?
A. makes the silicon on PCBs
B. amplifies weak signals
C. maintains a stable voltage
D. works in parallel with a capacitor

Which meter is always wired in series?
A. ohmmeter
B. ammeter
C. wattmeter
D. voltmeter

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Sample Questions (continued)

An increase in frequency across an inductor would _____ its inductive reactance.

A. decrease
B. increase
C. dampen
D. nullify

The capacitive reactance of a 0.1µF capacitor at 1 kHz equals

A. 1 kΩ
B. 1.6 kΩ
C. 2 kΩ
D. 3.2 kΩ

A darkened dot on a schematic where two or more lines cross means

A. a hole should be drilled in the printed circuit board
B. a node exists and the components are connected
C. the copper trace should be widened to carry more current
D. that point on the circuit board connects directly to ground

Optocouplers transfer electrical signals between two isolated circuits by using

A. current
B. fusion
C. light
D. magnetism

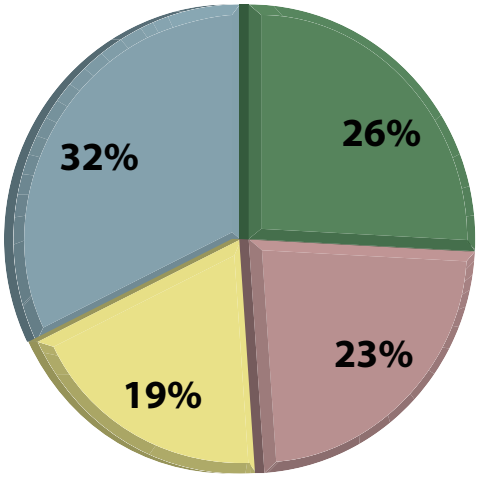
Use an isolation transformer to

A. separate earth ground from chassis ground
B. separate earth ground from RF ground
C. connect earth ground to the chassis ground
D. connect earth ground to the RF ground

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: 2 hours and 55 minutes
Number of Jobs: 4



Areas Covered:

26% Soldering and De-Soldering
Participant will select components, solder and de-solder using appropriate tools, and adhere to safety procedures.

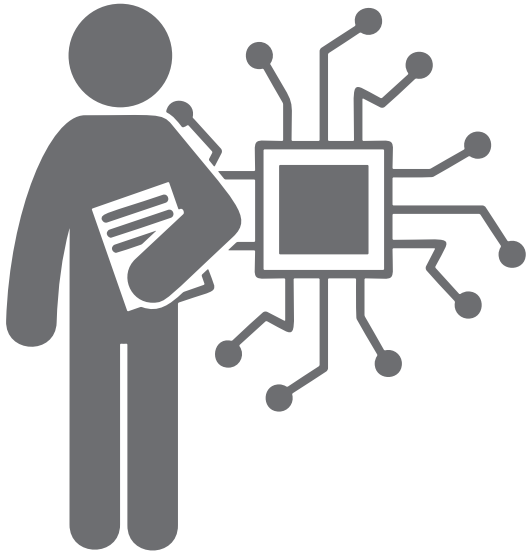
23% Power Supply Construction and Circuit Analysis
Participant will select components, use tools and equipment correctly following safety procedures, construct circuit with correct measurements, install capacitors, and measure voltages.

19% Operational Amplifier Construction and Analysis
Participant will select correct components, use tools and equipment properly following safety procedures, measure output voltage, display input versus output, and calculate and measure gain.

32% Design and Build a Combinational Logic Circuit
Participant will develop and simplify a Boolean expression, draw the gate logic diagram, and build and test the circuit.

Sample Job

Power Supply Construction and Circuit Analysis

Maximum Time: 45 minutes

Participant Activity: The participant will refer to the diagram provided and build the circuit, choose proper components from the selection given, measure and record the full RMS Secondary Voltage, measure the DC voltage and record the correct polarity from X to the ground and from Y to the ground.