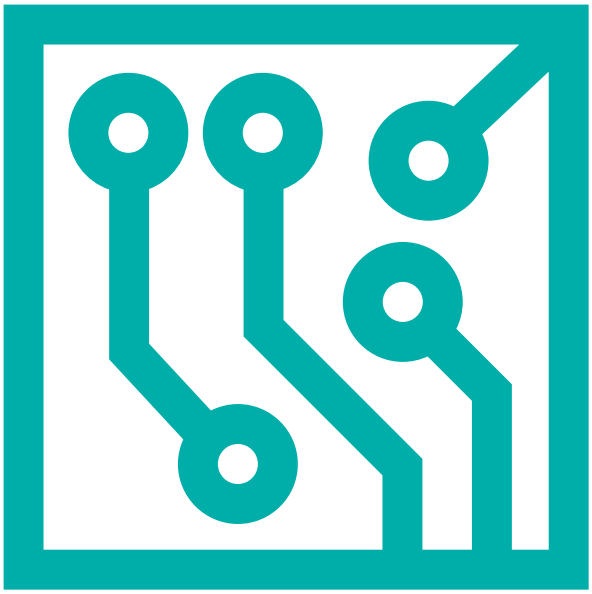
NOCTI

Teacher Credential Blueprint



Pre-Engineering/Engineering Technology

Code: 5955 / Version: 01

Original Release: 2018. Content Review: 2025. All Rights Reserved.

General Assessment Information

Blueprint Contents

General Assessment Information
Written Assessment Information
Specific Competencies Covered in the Test
Sample Written Items
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Test Type: The Pre-Engineering/Engineering Technology 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 subject matter experts representing the following states: Kentucky, New York, Pennsylvania, and 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

15.9999- Engineering Technologies/Technicians, Other

Learning that works for America CTE™

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

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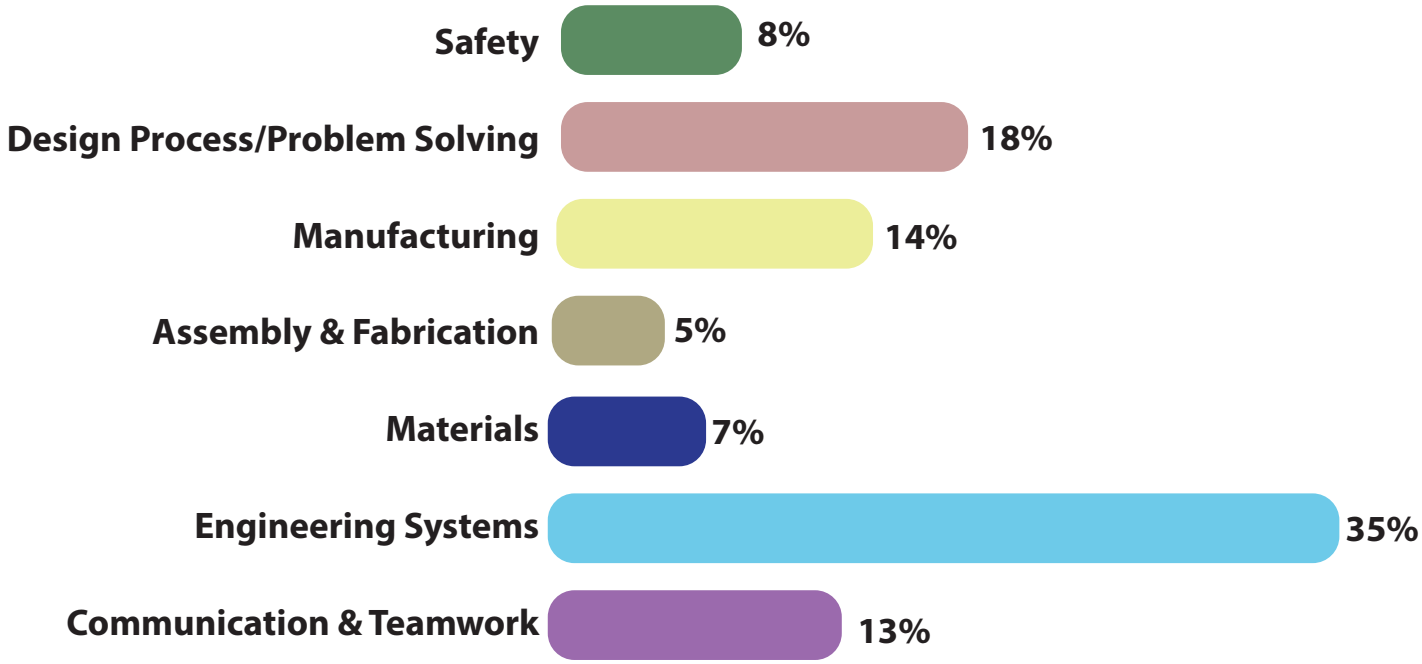
17-3027.00- Mechanical Engineering Technicians

Written Assessment

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

Administration Time: 3 hours
Number of Questions: 169
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

- Exhibit knowledge of appropriate personal safety procedures
- Describe the role of OSHA in the technical workplace
- Describe the use of standard safety equipment
- Select the appropriate safety equipment

Design Process/Problem Solving

- Identify principles of the problem solving process
- Outline the steps in the design process
- Translate word problems into mathematical statements
- Describe the importance of team participation in the design process
- Analyze solutions, identifying strengths and weaknesses
- Develop details of a solution
- Develop, test, and redesign prototypes

Manufacturing

- Identify common manufacturing operations (e.g., casting, molding, welding, finishing)
- Select appropriate hand tools for specific applications
- Select appropriate fasteners for specific applications
- Estimate and measure the size of objects using SI and US customary units
- Select appropriate measuring tools for specific applications
- Explain the role of quality control in manufacturing (e.g., tolerancing, datums, dimensioning)
- Distinguish between automated manufacturing control systems (e.g., PLCs, robotics, AGVs)

(Continued on the following page)

Specific Standards and Competencies (continued)

Assembly and Fabrication

- Explain the role of quality control in assembly and fabrication
- Differentiate between insourcing and outsourcing
- Identify the order and methodology of the assembly process

Materials

- Identify common materials
- Compare and contrast physical properties of materials
- Select correct materials for specific functions

Engineering Systems

- Solve problems using vectoring (e.g., predict resultant forces)
- Identify common forces that act on materials (e.g., torsion, shear, compression)
- Demonstrate the effect of electrical components within an electrical system
- Apply Ohm's Law, Watt's Law, and Kirchoff's Law
- Identify series, parallel, and combination circuits
- Apply knowledge of AC and DC systems
- Demonstrate the effect of resistance in a fluid system
- Apply knowledge of hydraulic, pneumatic, and mechanical systems
- Identify heat transfer methods
- Convert engineering measurements between different unit systems
- Compare/contrast conductors and insulators
- Solve thermal problems using appropriate units
- Determine appropriate uses of digital and analog systems

Communication and Teamwork

- Read and understand design documentation and technical manuals
- Write technical reports
- Deliver an oral presentation
- Express data in tables, graphs, and charts

Sample Questions

Immediately report the malfunction of any piece of equipment to

A. other employees
B. a safety engineer
C. the supervisor
D. OSHA

One creative method of increasing the number of engineering design alternatives is

A. computer-aided design
B. computer-aided manufacturing
C. brainstorming
D. optimizing

Consensus is

A. agreeing on a proposed solution
B. disagreeing on a proposed solution
C. participating in the census
D. reviewing the proposed solution

The technician should use a _____ to cut a keyway in a shaft.

A. milling machine
B. lathe
C. surface grinder
D. jig grinder

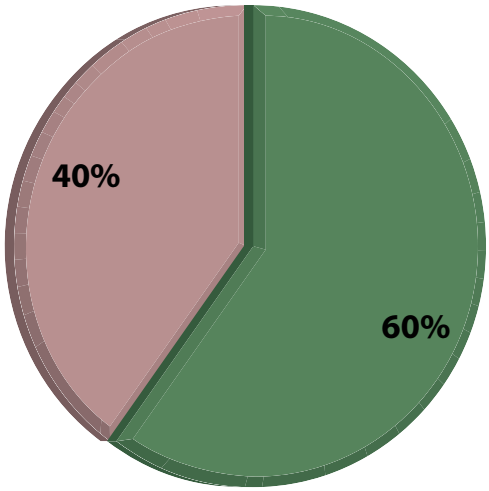
The acronym, OEM, refers to

A. Only Electrical Manufacturers
B. Original Equipment Manufacturer
C. Operations Efficiency Monitoring
D. Open Equipment Manufacturing

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 and 30 minutes
Number of Jobs: 2



Areas Covered:

60% Technical Writing
Participant will identify a problem or need, evaluate alternatives, design a solution, test the solution, analyze the results, draw conclusions, and format the report correctly.

40% Oral Presentation
Participant will give a presentation within the allotted time. Presentation will include; correct number of slides following the technical report, a slide with a chart or table, a question and answer period, and good overall presentation style.

Sample Job

Oral Presentation

Maximum Time: 1 hour

Participant Activity: Using presentation software, the participant will prepare and present a 5-minute oral presentation on the technical report previously prepared in Job 1 Technical Writing, including a specific number of slides, and one with a chart or table. The participant will host a question and answer period, and will display good presentation techniques throughout.

