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# **Manufacturing Technology**

## General Assessment Information

### Blueprint Contents

General Assessment Information	Sample Written Items
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**Test Type:** The Manufacturing 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 Kentucky, New York, and Oklahoma.



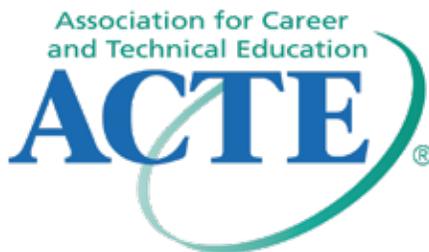
48.9999- Precision Production,  
Other



Career Cluster 13- Manufacturing



17.3026.00- Industrial  
Engineering Technician



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!



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

In the lower division  
baccalaureate/associate degree  
category, 1 semester hour in Facility  
Management

## Written Assessment

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

**Administration Time:** 3 hours

**Number of Questions:** 195

**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

### Areas Covered



## Specific Standards and Competencies Included in this Assessment

### Manufacturing Math, Science, and Measurement

- Apply math functions to solve problems
- Create and interpret graphs and charts commonly used in manufacturing
- Match measurement activities to manufacturing processes
- Demonstrate proper general and precision measurement techniques
- Using mechanical formulas, solve problems involving geometric shapes and metric conversions
- Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content

### Workplace Safety, Health, and Job Skills

- Complete forms and paperwork as required
- Identify issues involving basic industrial safety
- Maintain and use protective guards on equipment and machinery
- Use electrical devices correctly and safely
- Identify fire exits, fire-fighting equipment, and procedures
- Determine weight/operating limits of equipment
- Perform periodic checks during operation to assure proper function
- Identify, safely handle, and properly dispose of chemical, biological, and physical hazards
- Describe ergonomics and its importance to the manufacturing process



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## Specific Standards and Competencies (continued)

### Quality Assurance

- Identify components of an effective manufacturing system
- Explain the effect of quality assurance on profit
- Demonstrate the ability to apply continuous quality improvement to the manufacturing process
- Define and apply SPC (Statistical Process Control)
- Identify and address customer problems
- Perform inspections

### Blueprint Reading

- Interpret commonly used abbreviations, terminology, and symbols
- Determine tolerances and dimensions associated with a drawing
- Interpret blueprints to determine appropriate tool usage
- Identify types of lines within a drawing
- Extract information from title blocks and legends
- Identify various views

### Manufacturing Fundamentals, Processes, and Materials

- Demonstrate basic mechanical skills
- Perform troubleshooting and maintenance procedures
- Describe the importance of correct fixturing and workholding devices
- Describe the function of specific machine tools
- Locate and retrieve production materials specific to process flow and delivery schedule
- Demonstrate proper use and processes of manufacturing shop tooling
- Enter and edit a program in a Computer Numerical Control (CNC) machine
- Set up and operate a Computer Numerical Control (CNC) machine

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## Specific Standards and Competencies (continued)

### Material Handling

- Requisition, ship, handle, and store materials
- Apply knowledge of assembly lines
- Apply knowledge of materials and material handling procedures

### Industrial Robotics Systems

- Interpret appropriate industrial robotic functions and applications
- Interpret basic robotic programming, including CADD
- Identify various industrial robotic design features

### Computer Use

- Apply computer applications in manufacturing processes
- Identify possible effects of introducing automations into manufacturing processes
- Describe various methods of tracking inventory quantities
- Perform measurements using digital or electronic gauges interfaced with a CPU



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## Specific Standards and Competencies (continued)

### Process Control

- Identify a variety of process control applications
- Collect and analyze information to determine and improve work processes
- Explain the advantages and disadvantages of just-in-time inventory
- Interpret project plans
- Apply knowledge of time and motion studies
- Appropriately report job status

### Purchasing and Resource Identification Activities

- Exhibit knowledge of “make or buy” decisions
- Demonstrate knowledge of vendor relationships

### Electronics and Hydraulics

- Use various devices to gather electrical measurements (e.g., analog voltmeter, DMM)
- Apply knowledge of basic electronics and basic components
- Exhibit appropriate electrical wiring techniques
- Apply knowledge of hydraulics
- Interpret basic ladder diagrams
- Connect and program digital input and output devices to a robot controller Programmable Logic Controller (PLC)

### Design Processes

- Construct drawings using various commands in a Computer Aided Design (CAD) program
- Create a sketch of a multiview drawing given an isometric drawing
- Use Computer Aided Manufacturing (CAM) software to generate and post a Computer Numerical Control (CNC) program
- Design process procedure
- Exhibit knowledge of research and development (R and D)

Sample Questions (continued)

**With an increase from 90 degrees Fahrenheit to 100 degrees Fahrenheit, the density of water**

- A. increases substantially
- B. increases slightly
- C. decreases slightly
- D. decreases substantially

**The views on a working drawing are set up according to which of the following parameters?**

- A. perspective
- B. orthographic
- C. first angle
- D. isometric

**The common unit of measurement of inductance is the**

- A. henry
- B. farad
- C. mho
- D. ohm

**CAD/CAM software allows the user to**

- A. generate artistic sketches
- B. schedule conveyors
- C. replace the architect
- D. select tool diameters

**Time and motion studies**

- A. determine the facility capacity
- B. focus on product line
- C. focus on entire work group output
- D. determine the workload at a specific location

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### Sample Questions (continued)

**When working with capacitors, check to see that they are**

- A. wiped clean
- B. discharged
- C. disconnected
- D. charged

**The primary purpose of a counterbore is to**

- A. enlarge a hole already drilled
- B. cut a recess for a socket-head screw
- C. spot face a rough casting
- D. countersink a flat head screw

**To avoid confusion when wiring a DC circuit, always use \_\_\_\_\_ as the color of the primary hot lead, as required by code.**

- A. green
- B. white
- C. red
- D. black

**The original sample of a product or process used in research and development is called the**

- A. originator
- B. prototype
- C. instigator
- D. pattern

**The worker's partner in the JIT manufacturing model is the**

- A. customer
- B. vendor
- C. supervisor
- D. manager

## 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

**Number of Jobs:** 3

### Areas Covered:

#### **47% Milling Operations**

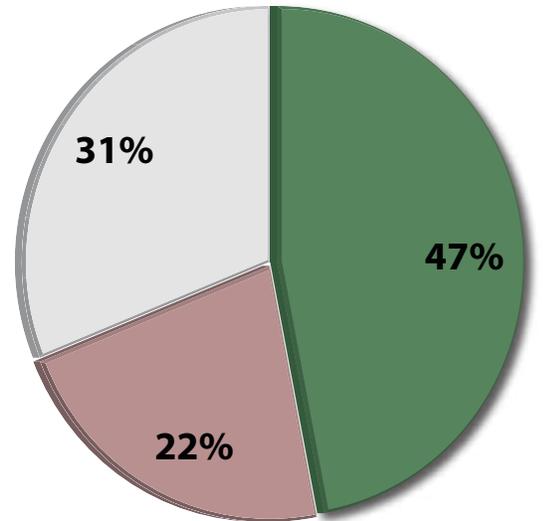
Participants will demonstrate ability to safely operate mill, indicate the vise and measurements correctly, overall finish and quality of work, clean up, and care of tools/equipment.

#### **31% Assemble a Multiple Shaft Gear Drive System**

Participants will safely mount the electric gear motor, install gears and pronny brake, and record current for final operational product.

#### **22% Determining Gage Block Combinations**

Participants will wire gage blocks together, verify and record combined height using a height gage.



## Sample Job

### Determining Gage Block Combinations

**Maximum Time:** 40 minutes

**Participant Activity:** The participant is to wring gage blocks together, verify and record combined height of the blocks using a height gage.

