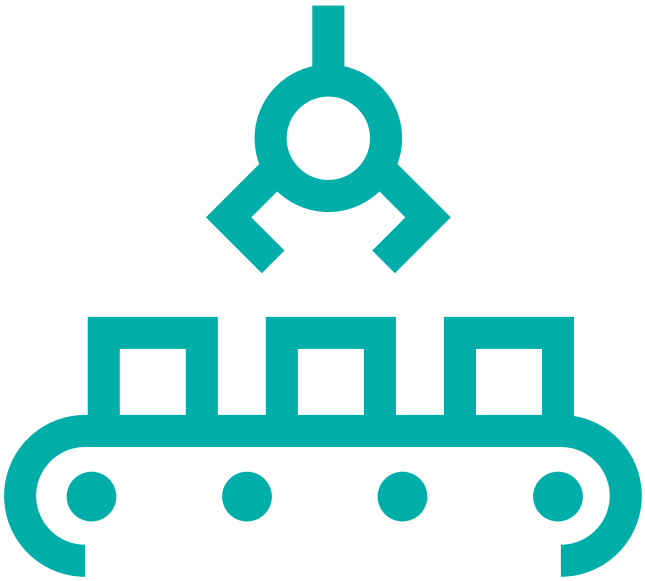
NOCTI

Teacher Credential Blueprint



# Industrial Maintenance Mechanics

Code: 5174 / Version: 01

# General Assessment Information

**Blueprint Contents**

General Assessment Information
Written Assessment Information
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**Test Type:** The Industrial Maintenance Mechanics 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: Arizona, Kentucky, and Michigan.

CIP Code

47.0303- Industrial Mechanics and Maintenance Technology

Learning that works for America CTE™

Career Cluster 13- Manufacturing

o*net™ in*it

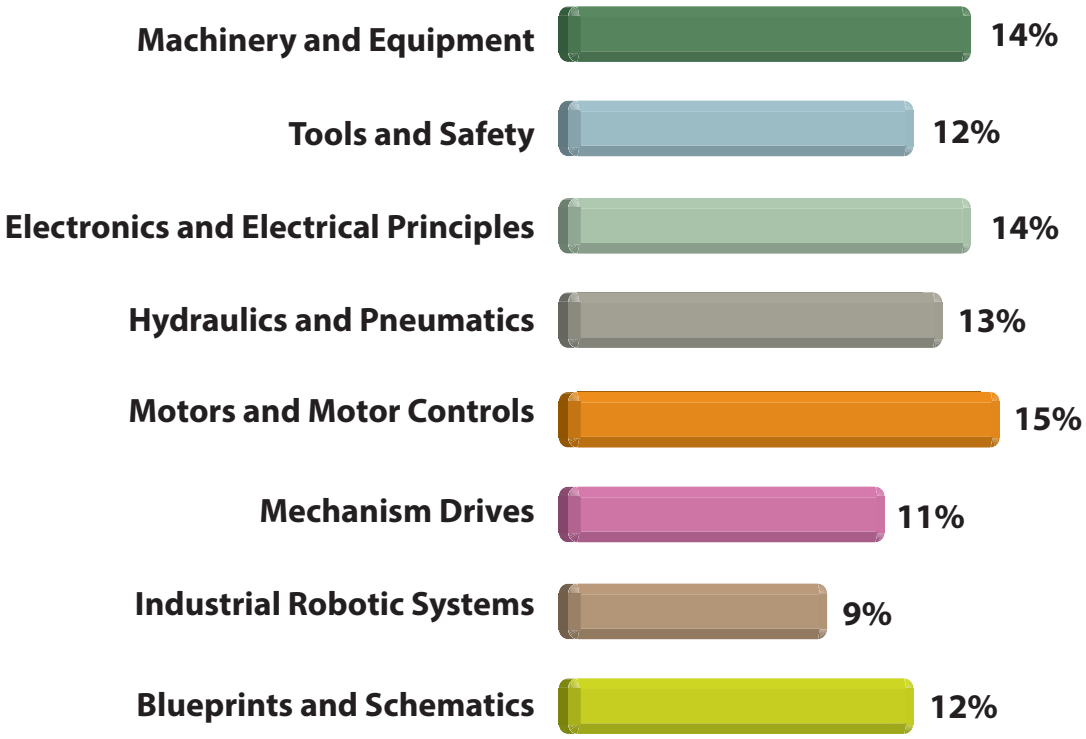
49-9041.00- Industrial Machinery Mechanics

# Written Assessment

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

**Administration Time:** 3 hours
**Number of Questions:** 160
**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

## Areas Covered



## Specific Standards and Competencies Included in this Assessment

**Machinery and Equipment**

- Disassemble, repair, and reassemble machinery/equipment
- Maintain operating condition and perform preventive maintenance of the machinery/equipment
- Identify and troubleshoot component defects and malfunctions
- Test operation of newly repaired machinery/equipment
- Analyze test results, machine error messages, and information from operators in order to diagnose machinery/equipment problems
- Maintain record of repairs and maintenance performed

**Tools and Safety**

- Select and differentiate appropriate use of various hand tools
- Demonstrate appropriate care of hand tools
- Identify and safely use large machine tools, including lathes, mills, hoists, rigging equipment, and presses
- Identify safe use of ladders and scaffolding
- Demonstrate understanding of lock-out/tag-out procedures
- Exhibit understanding of shop safety

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## Specific Standards and Competencies (continued)

**Electronics and Electrical Principles**

- Apply basic electrical principles
- Demonstrate knowledge of basic CNC operations
- Demonstrate knowledge of basic programmable logic controllers (PLCs)
- Exhibit basic knowledge of electrical symbols

**Hydraulics and Pneumatics**

- Interpret basic hydraulic and pneumatic symbols
- Apply knowledge of hydraulic and pneumatic components
- Interpret hydraulic and pneumatic principles

**Motors and Motor Controls**

- Apply basic electrical principles of motors
- Interpret appropriate applications for types of motors (linear, servo, AC induction, DC motors, and transformers)
- Select appropriate applications for frequency drives
- Identify motor components

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## Specific Standards and Competencies (continued)

**Mechanism Drives**

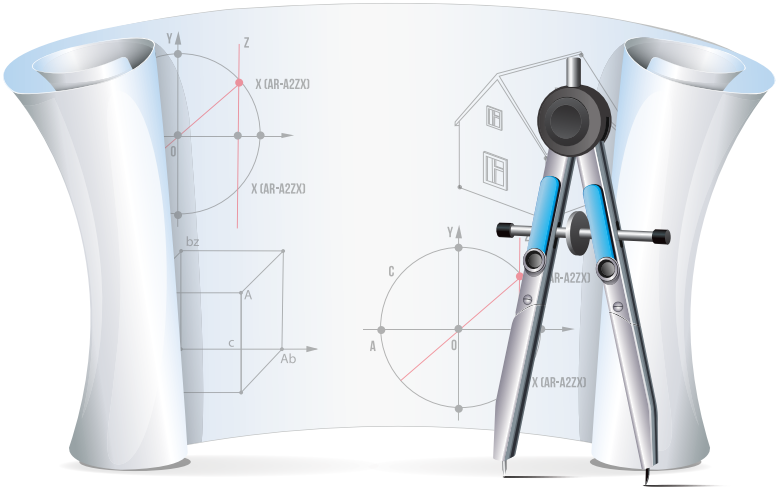
- Apply principles of mechanisms
- Identify appropriate applications of various gears and drives
- Demonstrate knowledge of appropriate set-up procedures
- Apply principles of mechanics

**Industrial Robotics Systems**

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

**Blueprints and Schematics**

- Interpret various lines
- Exhibit knowledge of legends
- Interpret blueprint and schematic components
- Interpret title block information
- Demonstrate knowledge of views, angles, and tolerances



## Sample Questions

**Pneumatic fluid power systems typically operate at pressure levels in which of the following ranges?**

A. under 250 psi
B. 250 to 1,000 psi
C. 1,000 to 2,000 psi
D. over 2,000 psi

**After receiving oil analysis test results for a hydraulic press, small particles of brass are found in the oil. This finding is directly due to**

A. thermal breakdown
B. lack of proper lubrication
C. component misalignment
D. wear of the part

**A method of using hardware-based components that overrides all other robot controls, removes drive power from the robot actuators, and brings all moving parts to a stop is called a/an**

A. interlock
B. emergency stop
C. echo check
D. guard

**An electrical switch that is actuated when the travel of a certain motion is reached and the actuator causing the motion is deactivated is called a/an**

A. limit switch
B. contact sensor
C. proximity sensor
D. end effector

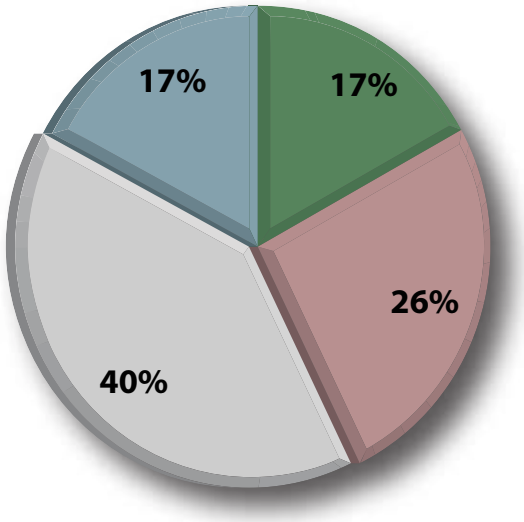
**The worker has a drive with a 40:1 ratio gearbox and wants to reduce the output shaft speed by 20 percent, what ratio does the replacement gearbox need to be?**

A. 32:1
B. 36:1
C. 48:1
D. 50:1

# 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:** 4




## Areas Covered:

**17% Connect and Operate a Circuit**
Assemble pneumatic circuit, test functionality of automatic mode, adjust flow control, switch to manual mode, safety.

**26% Assemble a Multiple Shaft Gear Drive System**
Mount and level motor, install and align flexible coupling, install and adjust gears, install prony brakes, start and run motor, record motor current, torque down prony brakes, record motor current rise, safety.

**40% Read and Interpret an Industrial Blueprint**
Material use, surface finish, surface tolerance, identify "Line B", include angle on taper, safety.

**17% Troubleshoot an Electrical Control System**
Determine the malfunction, remove faulty fuse, replace fuse, start and run motor, safety.

## *Sample Job*

**Read and Interpret an Industrial Blueprint**

**Maximum Time:** 30 minutes

**Participant Activity:** The participant will read the blueprint provided and properly record specifications.