

Mechanical Drafting and Design

Code: 4038 / Version: 01
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General Assessment Information

Blueprint Contents

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Test Type: The Mechanical Drafting and Design 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 Colorado, Michigan, Ohio, New York, Pennsylvania, South Carolina, and Virginia.



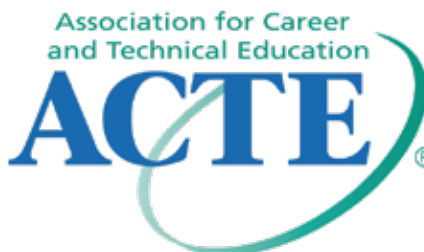
15.1306- Mechanical Drafting
and Mechanical Drafting
CAD/CADD



Career Cluster 2-
Architecture and Construction



17-3013.00-Mechanical
Drafters



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!

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General Assessment Information (continued)



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

In the lower division
baccalaureate/associate degree
category, 3 semester hours in
Mechanical Drafting

Written Assessment

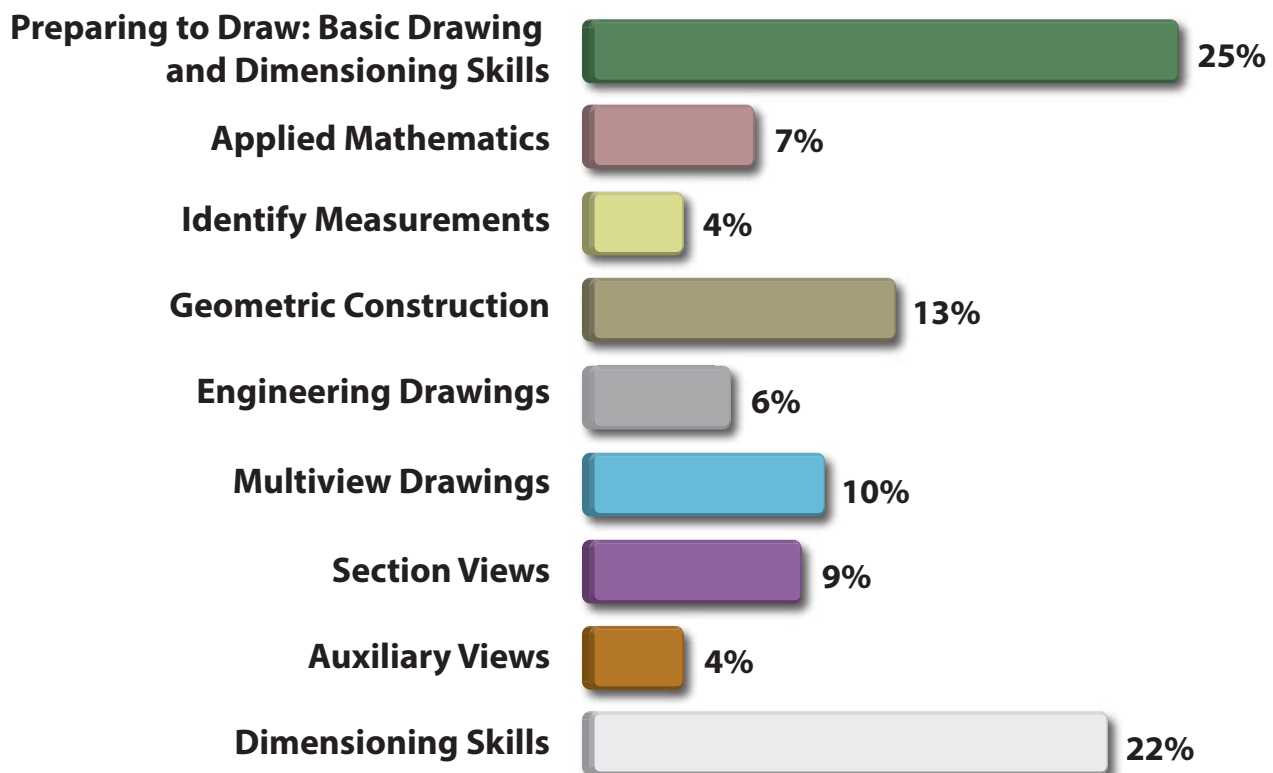
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 150

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

Areas Covered



Specific Standards and Competencies Included in this Assessment

Preparing to Draw: Basic Drawing and Dimensioning Skills

- Measure lines, angles, and geometric features
- Identify drawing views and details
- Identify assembly drawings, detailed drawings, and other drawings by type
- Identify revisions and apply engineering change information
- Identify and create line types
- Identify and create sketches
- Complete title block and apply reference information
- Identify and complete a parts list/bill of materials
- Select and interpret scale and paper size
- Identify and operate design tools/instruments (CAD and/or manual)
- Identify reference charts and tables

Applied Mathematics

- Demonstrate knowledge of mathematical operations
- Demonstrate knowledge of geometry and trigonometry

Identify Measurements

- Identify and read precision measurement tools
- Calculate unit conversion

Geometric Construction

- Draw lines and curved elements
- Construct perpendicular and parallel lines
- Construct tangent lines and arcs
- Construct geometric shapes
- Bisect and divide geometric elements

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Specific Standards and Competencies (continued)

Engineering Drawings

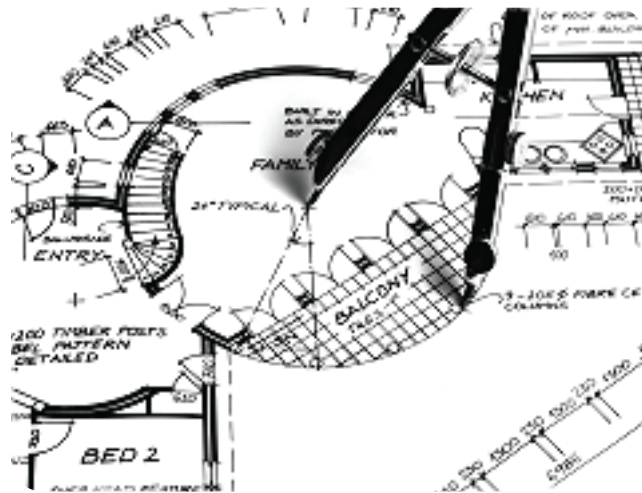
- Demonstrate knowledge of assembly and exploded assembly drawings
- Identify abbreviations and symbols
- Demonstrate knowledge of pictorial drawings

Multiview Drawings

- Demonstrate knowledge of multiview drawings
- Multiview projection (third angle and first angle)
- Differentiate between major surface types (normal, inclined, oblique, cylindrical)
- Identify common part features (fillets, rounds, draft angles, chamfers)

Section Views

- Identify and construct section views
- Identify ANSI material symbols
- Apply section rules



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Specific Standards and Competencies (continued)

Auxiliary Views

- Identify and construct auxiliary views
- Draw true view, true length lines, and true angles

Dimensioning Skills

- Locate and describe features
- Demonstrate knowledge of various unit dimensioning systems
- Identify finished surfaces
- Demonstrate knowledge of tolerances
- Identify and label common mechanical feature notations
- Place local and general notes, including fonts, lettering size, style, etc.
- Identify geometric dimensioning and tolerancing symbols
- Identify measurements



Sample Questions

What drawing method is used to illustrate, on a magnified scale, a view of an object which includes dimensions and clarification information specific to the object?

- A. detail drawing
- B. perspective drawing
- C. oblique drawing
- D. isometric drawing

An octagon has how many sides?

- A. 6
- B. 8
- C. 9
- D. 12

A key feature of an exploded assembly drawing is its arrangement

- A. by two organizational systems
- B. by vertical placement
- C. as a spatial relationship of parts
- D. as parts ordered by size

Current drafting practices or standards are established by

- A. HOSA
- B. ANSI/ASME
- C. ASA
- D. OSHA

When specifying and identifying threads, what does the underlined number in $1/2 - \underline{13}UNC-2A$ represent?

- A. nominal diameter
- B. class of fit
- C. threads per inch
- D. size of thread in millimeters

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Sample Questions (continued)

What is the most important rule in freehand sketching?

- A. Never sketch in color.
- B. Keep the sketch in proportion.
- C. Always use the squares method.
- D. Always use drafting tools.

An isometric and oblique are examples of _____ drawings.

- A. realistic
- B. pictorial
- C. common
- D. cavalier

There are _____ normal viewing planes to view an object.

- A. 2
- B. 4
- C. 6
- D. 8

Auxiliary views are always projected from an edge of a surface that is

- A. hidden from view
- B. horizontal to the viewing plane
- C. nonparallel to a principal view
- D. perpendicular to the viewing plane

How many degrees are in a straight line?

- A. 160 degrees
- B. 180 degrees
- C. 200 degrees
- D. 360 degrees

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:

21% Auxiliary Views

Participants will use proper tools and programs to complete top view, front view, and partial auxiliary view drawings, with correct line quality.

36% Drawing Completion and Dimensioning

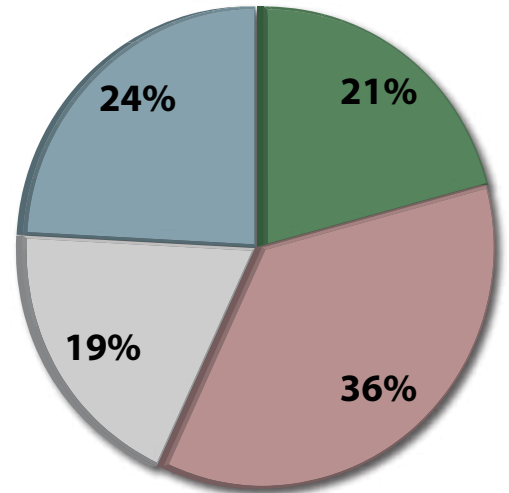
Participants will use tools or programs to complete top view, front view, and right side view drawings with correct line quality, placement of dimensions, and tolerance of feature sizes and locations.

19% Pattern Development

Participants will use tools or programs and correct construction techniques to draw a solution with correct line quality.

24% Section Drawing

Participants will use tools and programs to complete front view, and full section view drawings with correct hatch pattern and line quality.



Sample Job

Auxiliary Views

Maximum Time: 35 minutes

Participant Activity: CAD or Manual Options: Using the graphic provided, the participant will draw a top, front, and partial auxiliary view showing inclined surface, true size and shape on an A-size drawing sheet. Manual Option only – showing construction lines is optional and will not be graded.

