Measuring What Matters in CTE®

Teacher Assessment Blueprint

Mechanical Drafting and Design

Test Code: 5272 / Version: 01

General Assessment Information

Blueprint Contents

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

CIP Code

15.1306- Mechanical Drafting and Mechanical Drafting CAD/CADD

Learning that works for America CTE™

Career Cluster 2- Architecture and Construction

o*net™ in*it

17-3013.00- Mechanical Drafters

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

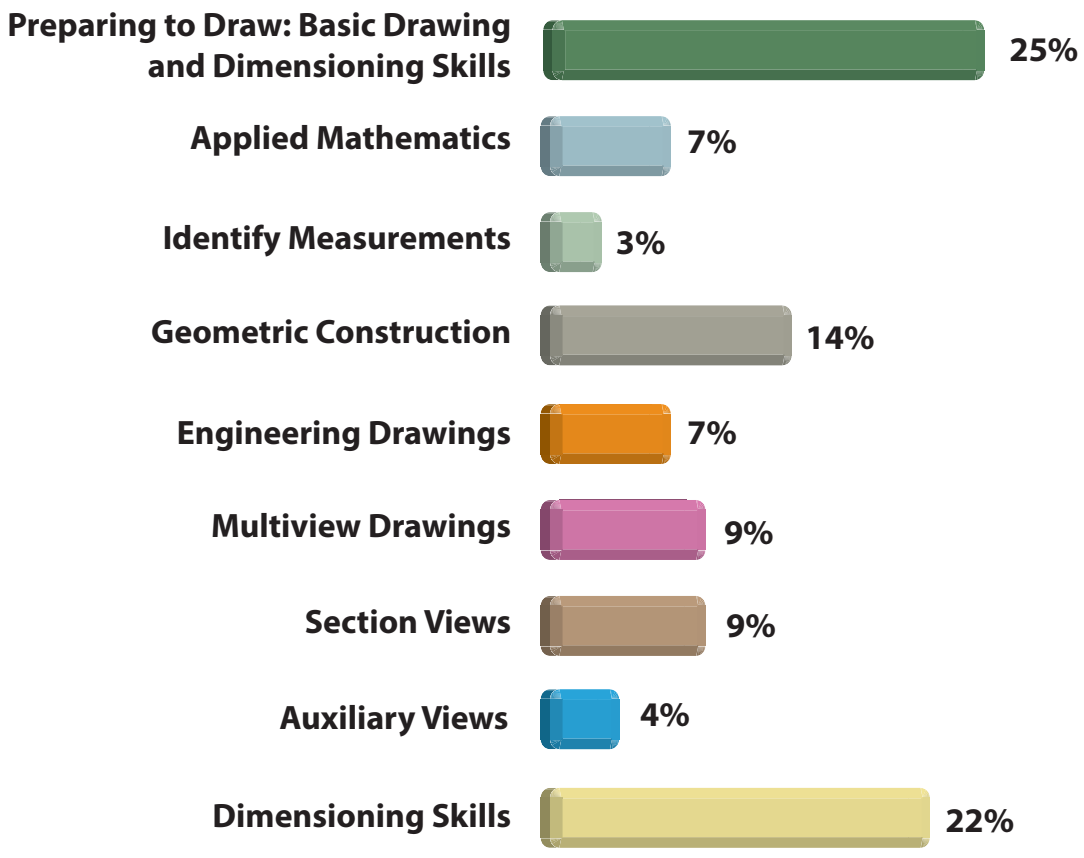
In the lower division baccalaureate/associate degree category, 3 semester hours in Mechanical Drafting

Written Assessment

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

Administration Time: 3 hours
Number of Questions: 146
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

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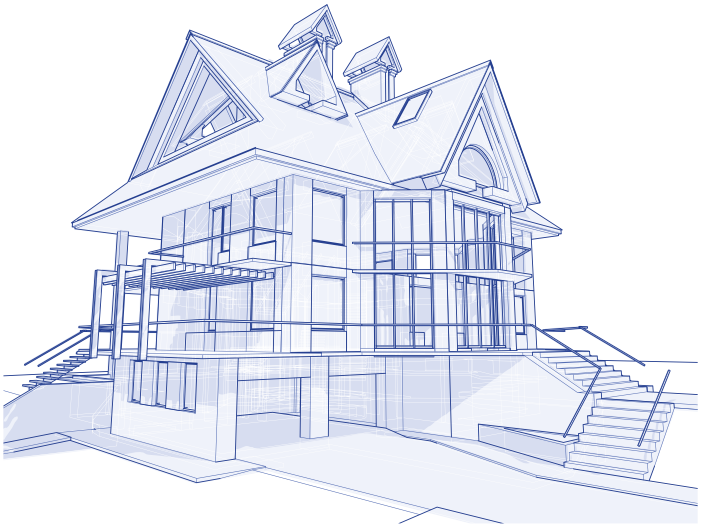
Specific Standards and Competencies (continued)

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

Engineering Drawings

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



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Specific Standards and Competencies (continued)

Multiview Drawings

- Demonstrate knowledge of multiview drawings
- Demonstrate knowledge of multiview projection (third angle and first angle)
- Differentiate between major surface types (normal, inclined, oblique, cylindrical)

Section Views

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

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 type of drawing illustrates the objects so that they appear proportionately smaller with distance?

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

An octagon has how many sides?

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

A key feature of an exploded assembly 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

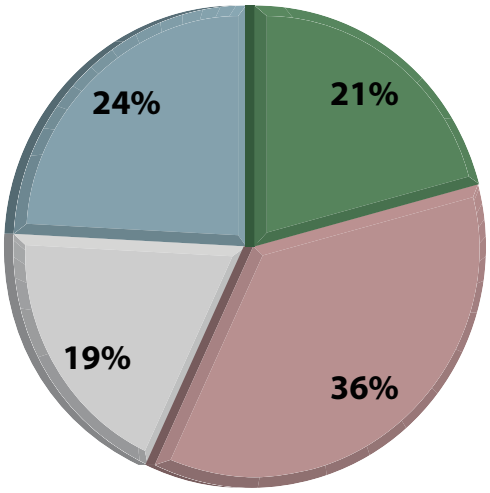
When specifying and identifying threads, what does the underlined number in 1/2 - 13UNC-2A represent?

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

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

24% Section Drawing
Participant 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.