

Massachusetts Technical Teacher Testing Program Drafting Content Outline

Written and Performance Exam General Overview

- The intent of this exam is to assess your ability to teach the skills found in the Massachusetts Technical Education Framework.
- This exam is aligned to the frameworks which can be accessed [here](#).
- Many questions and tasks require a synthesis of knowledge based on experience in the field and may not be found in any book.
- Candidates are encouraged to prepare for their exam by reviewing textbooks and reference material which has been listed as part of this exam outline. These resources can be found using online search tools, online vendors, and websites.
- Contact the Technical Teacher Testing Office if you need further assistance in locating resources listed in the exam outline.
- Use this exam outline and the Massachusetts Technical Education Framework to focus your preparation for the exam.

Written Exam

- Number of Questions: 100
- Administration Time: 3 hours
- Administration Method: Remote Proctoring Online Session

Written Exam Content Coverage

2%	<i>Drafting Safety Knowledge</i>
20%	<i>Fundamentals of Drafting and Design</i>
8%	<i>Conventional Drafting Techniques and Skills</i>
20%	<i>Computer Aided Drafting and Design</i>
15%	<i>Mechanical Drafting and Design</i>
13%	<i>Architectural Drafting and Design</i>
2%	<i>Sustainability</i>
20%	<i>Drafting Related Mathematics</i>

Written Exam Reference Materials (Reference Current Edition)

- **Engineering Drawing and Design** by David A. Madsen, Cathy Stark, Terrance M. Shumaker, J. Lee Turpin (Delmar)
- **Mechanical Drawing** by Thomas E. French (McGraw-Hill)
- **Applying AutoCAD** by Terry T. Wohlers (Glencoe)
- **Technical Drawing** by David E. Goetsch, John A. Nelson, and William S. Chalk (Delmar)
- **AutoCAD: A Problem Solving Approach** by Sham Tickoo (Autodesk Press)
- **Architectural Graphic Standards (Ramsey/Sleeper Architectural Graphic Standards)** by American Institute of Architects, Dennis J. Hall, and Nina M. Giglio (Wiley)
- **Trigonometry Tables and Handy References for Engineers**
(https://www.carrlane.com/Portals/0/PDFs/Trig_Book_Revised_20150204_forweb.pdf)

Materials Needed for the Written Exam

- A four-function calculator is included in the online testing system. No other calculators are permitted.
- Scrap paper and pencil/pen are permitted.

Written Exam Sample Items

Each question on the exam consists of one incomplete sentence or question followed by four choices. Some items reference an image or diagram. A few sample items are included below; the correct answer is designated with an asterisk (*).

Which of the following sheet sizes accommodates Mech. "C" and Arch. "C" sheet sizes?

- a. 36" x 24", 34" x 22"
- *b. 24" x 18", 22" x 17"
- c. 11" x 8 1/2 ", 17" x 11"
- d. 17" x 11", 18" x 12"

In what dimension form should all dimension text appear horizontal?

- a. X, Y
- b. Aligned
- c. Associative
- *d. Uni-Directional

Performance Exam

- Administration Time: 4 hours
- Administration Method: Onsite at an approved Teacher Testing Location

Performance Exam Content Coverage

Note: Candidates have the option of taking Test #1 or Test #2. Candidates are not required to take both tests.

Mechanical CADD Component Option

30% *Fundamentals of Drafting and Design*

35% *Computer Aided Drafting*

35% *Mechanical Drafting and Design*

Candidates will be required to prepare two sheets:

1. A mechanical exploded assembly with balloons and a bill of materials on Sheet #1.
2. All detail of drawings of the parts on Sheet #2. The details will include all required views, dimensioning per ANSI standards, calculations, and applying class of fits and geometric tolerancing.

Note: A Machinery's Handbook will be available for use during the exam.

Architectural CADD Component Option

40% *Fundamentals of Architectural CADD*

60% *Developing Architectural CADD Drawings*

- Floor Plan
- Exterior Elevation
- Building Section

Candidates will be required to prepare three sheets:

1. An Architectural "floor plan" of a single-story residence (Ranch), with attached garage on Sheet #1. The floor plan will be fully dimensioned, including room, door, and window tags, following standard architectural practices.
2. An exterior elevation of the "FRONT" of the same structure on Sheet #2. The elevation will call out all necessary construction materials, including door and window tags, and dimensions following standard architectural practices.
3. A full building section of the same structure on Sheet #3. The building section will call out all necessary construction materials, including room, door and window tags, and dimensions following standard architectural practices.

Materials Required for the Performance Exam (Candidate Must Supply)

- Face mask (cotton face covering or respirator which fully cover the nose and mouth)
- Disposable Gloves

Equipment Available at Testing Location

- AutoDesk
 - AutoCAD
 - Inventor
 - Revit
- Dassault System
 - SolidWorks

Note: Candidates must notify NOCTI two weeks prior of the software desired to be used. If the software is not one of those listed above, the candidate must use their own laptop with a legal copy of the software loaded. The candidate must receive verification and approval from the exam administrator. Upon completion of the exam, the exam administrator will remove all exam files from the candidate's personal laptop. No books or notes will be allowed. Cell phones are prohibited during the exam administration.

Onsite Performance Exam Requirements

- Candidate must practice social distancing and wear the appropriate face covering that covers the nose and mouth while at the exam site.
- Testing sites may have individual requirements based on location and the current guidance from the Center for Disease Control and Prevention (CDC).

Performance Exam Reference Materials (Reference Current Edition)

- **Mechanical**
 - **Technical Drawings** by Frederick Giesecke, Ivan Hill, Alva Mitchell, and Henry Spencer (The MacMillan Company)
 - **Machinery's Handbook** (Industrial Press)
- **Architectural**
 - **Architectural Graphic Standards (Ramsey/Sleeper Architectural Graphic Standards)** by American Institute of Architects, Dennis J. Hall, and Nina M. Giglio (Wiley)
 - **Drafting Standards (ANSI)**
- **OSHA Regulations** www.osha.gov
 - [1910.1200 - Hazard Communication](#)
 - [1910 Subpart I - Personal Protective Equipment](#)