

# Massachusetts CTE Teacher Testing Program Marine Service Technology Content Outline

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## Written and Performance Exam General Overview

- The intent of this exam is to assess the candidate's ability to teach the skills found in the Massachusetts Technical Education Framework.
- The written exam is a state-developed exam aligned to the frameworks which can be accessed [here](#). The performance exam is a NOCTI-developed teacher test and has been determined by DESE to align to the state frameworks.
- Many questions and tasks require a synthesis of knowledge based on experience in the field and may not be found in any book.
- Use this exam outline and the Massachusetts Technical Education Framework to focus your preparation for the exams.
- Candidates are encouraged to prepare for their written exam by reviewing textbooks and reference material which have been listed as part of this exam outline. These resources can be found using online search tools, online vendors, and websites.

## Written Exam

- Number of Questions: 100
- Administration Time: 3 hours
- Passing Score: 70.0%
- Administration Method: Remote Proctored Online Testing Session

## Written Exam Content Coverage

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| <b>5%</b>  | <b><i>ARC, MIG, and TIG Welding</i></b>  |
| <b>5%</b>  | <b><i>Boatbuilding and Repair</i></b>  |
| <b>18%</b> | <b><i>Fuel Systems in Marine Services</i></b>  |
| <b>10%</b> | <b><i>Health and Safety</i></b>  |
| <b>10%</b> | <b><i>Fundamentals of Hand Tools, Power Tools, Fasteners, and Measuring Procedures</i></b> |
| <b>20%</b> | <b><i>Fundamentals of Marine Service Maintenance Areas</i></b>                             |
| <b>22%</b> | <b><i>Fundamentals of Overhaul of Four and Two Stroke Engines</i></b>                      |
| <b>10%</b> | <b><i>Fundamentals of Shop Practices to Industry Standards</i></b>                         |

## Written Exam Reference Materials (Reference Current Edition)

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- **Audel Welder's Guide** by Frank D. Graham
- **John Deere Tool Book**
- **Evinrude Maintenance Manual**
- **American Boat and Yacht Council Manual**

## Materials Needed for the Written Exam

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- 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

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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 (\*).

Marine conductors shall be supported throughout their length or shall be secured at least:

- a. every 18 inches. (\*)
- b. at the fuel tank.
- c. every 5 feet.
- d. over the engine.

A fresh supply of the fuel-air mixture is provided in almost all outboard motors by:

- a. compression increasers.
- b. supercharging.
- c. crankcase scavenging. (\*)
- d. air pumps.

## Performance Exam

- Administration Time: 3 hours and 45 minutes
- Passing Score: 70.0%
- Administration Method: Onsite at a DESE approved Massachusetts Area Testing Center (MATC) location. Candidates must register and schedule their exam session through NOCTI.

## Performance Exam Content Coverage

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### **19% Marine Gasoline Engine Tune-Up**

*The candidate will tune up a standard 4-cylinder gasoline engine ignition system, change spark plugs, points, condenser, rotor, distributor cap, remove and reinstall distributor, and check setting of ignition timing with a timing light according to OSHA and industry standards.*

**19% Diesel Engine Repair**

*The candidate will set valves on a small 4-cycle diesel engine, using the Engine Tune-Up Guide to obtain manufacture's specification settings.*

**15% Fuel Filter Change**

*The candidate will change and check operation of fuel, secondary fuel filter (shell and element type) on a small diesel engine according to industry and OSHA standards.*

**15% Troubleshoot Marine Starter System**

*The candidate will troubleshoot starting and charging system circuits according to industry and OSHA standards.*

**13% Outboard Lower Unit Oil Change**

*The candidate will drain oil from outboard lower unit and check oil condition. Pressure test lower unit chamber and fill the lower unit with new oil according to industry and OSHA standards.*

**13% Use of Measurement Tools**

*The candidate will use a micrometer to check thrust washer (bearing), one (1) each main bearing and crankshaft main journal for wear.*

**6% Safety**

*The candidate will be assessed according to the demonstration of appropriate safety guidelines. The following tasks must be completed particularly but not limited to industry and OSHA safety regulations.*

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## Performance Exam Requirements

### Candidate Supplied

Candidates must bring all appropriate Personal Protective Equipment (PPE), attire/uniform, and any other safety items routinely expected to be used by an employee in the related industry. In addition, candidates must bring all materials listed below to the exam site. No borrowing from other candidates or examiners will be allowed. If the candidate does not bring what is needed to safely complete all jobs on the exam as required in the workplace, the testing session will need to be rescheduled at the candidate's expense.

- Face mask (cotton face covering or respirator which fully cover the nose and mouth)
- Eye protection
- Work clothes and boots/shoes

### Site Supplied

Additional equipment and supplies needed to complete the jobs on the performance test will be provided by the testing site.

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## Performance Exam Site Requirements

Testing sites may have individual requirements based on location and any relevant and current guidance from the Center for Disease Control and Prevention (CDC).