

# Massachusetts CTE Teacher Testing Program Horticulture Content Outline

## 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

<b>10%</b>	<b>Fundamentals of Health and Safety</b> <ul style="list-style-type: none"> <li>• Health and Safety Regulations</li> <li>• Practices</li> </ul>	<ul style="list-style-type: none"> <li>• Pesticide Application License (CORE)</li> </ul>
<b>15%</b>	<b>Botany</b> <ul style="list-style-type: none"> <li>• Plant Classification</li> <li>• Cell Biology</li> </ul>	<ul style="list-style-type: none"> <li>• Plant Anatomy and Physiology</li> <li>• Plant Reproduction</li> </ul>
<b>15%</b>	<b>Plant Health Care</b> <ul style="list-style-type: none"> <li>• Entomology</li> <li>• Pathology</li> </ul>	<ul style="list-style-type: none"> <li>• Nutrients</li> <li>• IPM</li> </ul>
<b>5%</b>	<b>Soils</b> <ul style="list-style-type: none"> <li>• Characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Fertility</li> </ul>

- 12% Greenhouse Management and Production**
  - Greenhouse Structure
  - Growing Media Fertilizers
  - Fertilization
  - Watering
  - Propagation
  - Plant Production
  - Pest Control
  - Calculate Material Costs and Amount
- 23% Landscaping Design and Construction**
  - Plant Types
  - Maintenance
  - Pruning
  - Construction Costs
- 5% Arboriculture and Landscape Equipment**
  - Commercial Mower Maintenance
- 5% Floriculture**
  - Floral Design and Interior Landscape
- 10% Turfgrass Management**
  - Grass Types
  - Lawn Renovations
  - Pest Control

### Written Exam Reference Materials (Reference Current Edition)

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- **Ornamental Horticulture: Science, Operations & Management** by Jack E Ingels
- **Landscaping Principles and Practices** by Jack E. Ingels
- **Introductory Horticulture** by Edward H. Reiley and Carroll L. Shry, Jr.
- **FFA Plant Identification List**
- **Horticulture Today** by Jodi Songer Riedel and Elizabeth Driscoll (Goodheart-Willcox)
- **University of Massachusetts Soil and Plant Tissue Testing Laboratory**  
(<https://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory>)
- **Umass Extension Fact Sheet: Planting and Maintaining Trees and Shrubs**  
(<https://ag.umass.edu/landscape/fact-sheets/guidelines-for-planting-trees-shrubs>)

### 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 (\*).

The mower type that gives the best cut is the:

- a. rotary.
- b. reel. (\*)
- c. flail.
- d. all cut the same if sharpened according to specifications.

Which tree group does not have opposite branching?

- a. Maple
- b. Dogwood
- c. Ash
- d. Oak (\*)

## Performance Exam

- Administration Time: 4 hours
- NOCTI Criterion-Referenced Cut Score/Passing Score: 70%
- 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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### 8% **Plant Science**

*The candidate will identify provided live or preserved types of plants. Select common and botanical names from a master list to identify specimens. Record the type of plant category each specimen belongs to on the answer sheet.*

### 22% **Maintaining Plants**

*The candidate will accurately measure and prepare water soluble fertilizer concentrations for direct feed of plants or for use as a stock solution. The candidate will measure fertilizer per label instructions to prepare liquid feed in a watering can for direct use. Measure quantities of fertilizer to prepare a stock solution for a given water quantity according to specifications, industry and OSHA standards.*

### 26% **Plant Production**

*The candidate will demonstrate transplanting of small starter plants into larger containers for growing to finish stage according to industry standards. Select seedlings of appropriate size for transplanting from a seed starting tray to a larger container.*

**33% Horticulture Equipment**

*The candidate will demonstrate knowledge of basic external and internal operational parts of small engine. The candidate will identify by naming the parts of various equipment and engine systems as labeled.*

**11% Health and Safety**

*The candidate will demonstrate safety knowledge and follow all procedures according to industry and OSHA Standards.*

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## Performance Exam Requirements

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### Candidate Supplied

Candidates must bring all appropriate Personal Protective Equipment (PPE), attire/uniform, and any other safety items as is routinely expected to be used by an employee in the related industry. 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.

### 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

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