



## Milwaukee Area Technical College

# HORT-127 Arboriculture 1: Tree Care Fundamentals

## Course Outcome Summary

### Course Information

<b>Description</b>	Students will learn concepts in landscape tree management and health such as establishment, pruning, bracing and cabling, problem treatments, fertilization, decay and risk, and rigging and removal. Rope and harness tree climbing skills and equipment are provided, as well as knot tying, reduction and treatment of construction damage, and tree inventory systems. Power equipment such as brush chippers, stump cutters, aerial lifts, root excavators, and chainsaws are covered. The current Safety Requirement Standards (ANSI Z133.1) and Standard Practices (ANSI A300) are stressed.
<b>Total Credits</b>	3
<b>Total Hours</b>	64

### Types of Instruction

Instruction Type	Credits/Hours
Lecture	2cr/32hrs
Lab	1cr/32hrs

### Career Essentials

1. Professionalism

### Program Outcomes

#### 1. Communicate as a horticulture professional

*Status*    *WIP*

##### Criteria

- 1.1. learner refers to plants by common and approved nomenclature
- 1.2. learner articulates phases of project management
- 1.3. learner displays professional character
- 1.4. learner interacts with professional organizations, colleagues, and community
- 1.5. learner applies current technology to the profession

#### 2. Provide horticulture maintenance

*Status*    *WIP*

##### Criteria

- 2.1. learner protects existing vegetation, structures, and property
- 2.2. learner implements cultural practices to maintain plants and or communities
- 2.3. learner operates maintenance equipment
- 2.4. learner schedules maintenance operations
- 2.5. learner adheres to safety standards

#### 3. Apply the principles of plant science

*Status*    *WIP*

**Criteria**

- 3.1. learner identifies parts of a plant
- 3.2. learner identifies plants by their characteristics
- 3.3. learner summarizes the plant's physiological process
- 3.4. learner selects the right plant for the right place
- 3.5. learner determines the correct plant cultural requirements

**Course Competencies**

**1. Evaluate safe working practices.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 1.1. Written Objective Test
- 1.2. Scenario Response

**Criteria**

*Your performance will be successful when:*

- 1.1. you determine if actions are considered violations of the current Z133 Safety Standard for Tree Care Operations.
- 1.2. you analyze a written work scenario for safety violations.
- 1.3. you identify 90% or more of the safety violations.

**Learning Objectives**

- 1.a. Examine safe chainsaw operation.
- 1.b. Examine safe chipper operation.
- 1.c. Examine safe climbing techniques.
- 1.d. Examine safe rigging and removal operations.

**2. Perform pruning cuts.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 2.1. On-the-job Performance
- 2.2. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 2.1. your pruning cut is not torn, nor eared, nor stubbed, nor flush.
- 2.2. your pruning cut maintains an intact branch collar and branch bark ridge.
- 2.3. you choose a suitable tool to make the cut.
- 2.4. You complete the assessment with 75% or more accuracy.

**Learning Objectives**

- 2.a. Identify the branch bark ridge.
- 2.b. Identify the branch collar.
- 2.c. Describe advantages and limitations to various pruning equipment.

**3. Apply tree care standards to maintenance activities.**

**Linked Career Essentials**

Professionalism

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 3.1. Written Objective Test
- 3.2. Case Study

**Criteria**

*Your performance will be successful when:*

- 3.1. you apply ANSI A300 (Part 1) standards to tree pruning scenarios.
- 3.2. you apply ANSI A300 (Part 2) standards to tree fertilization scenarios.
- 3.3. you apply ANSI A300 (Part 3) standards to tree repair scenarios.

- 3.4. you apply ANSI A300 (Part 4) standards to tree lightning protection scenarios.
- 3.5. you apply ANSI A300 (Part 6) standards to tree planting scenarios.
- 3.6. You complete the assessment with 75% accuracy.

**Learning Objectives**

- 3.a. Interpret accepted practices in tree pruning.
- 3.b. Interpret accepted practices in tree fertilization.
- 3.c. Interpret accepted practices in tree establishment.
- 3.d. Interpret accepted practices in tree cabling and bracing.

**4. Participate in the rigging and removal of a tree.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 4.1. On-the-job Performance

**Criteria**

*Your performance will be successful when:*

- 4.1. you participate during the removal.
- 4.2. you assist with tying knots, hauling brush, chipping brush, running rigging lines, or cutting up wood.
- 4.3. you wear appropriate personal protective equipment during the class.
- 4.4. You participate during 100% of the removal.

**Learning Objectives**

- 4.a. Provide friction on a rigging line using a Porta-wrap or GRCS.
- 4.b. Operate a brush chipper.
- 4.c. Operate a chainsaw.

**5. Plant a tree.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 5.1. On-the-job Performance
- 5.2. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 5.1. you participate in planting your tree with your group.
- 5.2. you plant the tree with 90% agreement with the A300 planting standards.
- 5.3. you clean up the planting site.

**Learning Objectives**

- 5.a. Evaluate methods in planting trees.
- 5.b. Describe soil properties for maximum root growth.
- 5.c. Explain benefits and disadvantages to various planting tools.

**6. Describe fertilization needs of a tree.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 6.1. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 6.1. you recommend treatments based on the A300 fertilization standards.
- 6.2. you calculate the correct amount of fertilizer to apply.
- 6.3. you maintain 75% accuracy.

**Learning Objectives**

- 6.a. Describe features of a healthy soil.
- 6.b. Outline advantages to mulching trees with organic mulch.
- 6.c. Explain the effects of high pH on soil elements and tree health.

**7. Describe how to cable and brace a tree.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

7.1. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 7.1. you chose hardware for a cabling scenario based on the A300 standard.
- 7.2. you place the hardware in a configuration based on the A300 standard.
- 7.3. you maximize the health of the tree based on the A300 standard.
- 7.4. you describe the advantages and disadvantages of using steel hardware.
- 7.5. you describe the advantages and disadvantages of using synthetic hardware.
- 7.6. you complete the assessment with 70% or more accuracy.

**Learning Objectives**

- 7.a. Identify components in a steel cabling system.
- 7.b. Identify components in a hollow rope cabling system.
- 7.c. Compare steel cable systems to hollow rope systems.
- 7.d. Describe how trees react to newly installed cable systems.

**8. Operate arboricultural equipment.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

- 8.1. On-the-job Performance
- 8.2. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 8.1. you evaluate the safety protocol for each piece of equipment.
- 8.2. you participate in operating at least 60% of the equipment.
- 8.3. you participate in operating chainsaws, brush chippers, highlifts, stump cutters, and air spades.

**Learning Objectives**

- 8.a. Evaluate the safe operation of arboriculture equipment using the ANSI Z-133 standard.
- 8.b. Identify safety placards on equipment.

**9. Prescribe treatments for tree care problems.**

**Linked Program Outcomes**

Provide horticulture maintenance

**Assessment Strategies**

9.1. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 9.1. you prescribe treatments to tree care problem scenarios.
- 9.2. your treatment minimizes negative impacts to the tree.
- 9.3. your complete your assessment to within 70% accurate or better.

**Learning Objectives**

- 9.a. Describe benefits of micro-trunk injections.
- 9.b. Describe benefits of macro-trunk injections.
- 9.c. Compare pesticides and fertilizers used to improve the health of landscape trees.

**10. Apply CODIT theory to decayed samples.**

**Linked Program Outcomes**

Apply the principles of plant science

**Assessment Strategies**

10.1. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 10.1. you identify the barrier walls on a decayed sample.

- 10.2. you predict the decay spread in future years.
- 10.3. you assess the risk of failure of the wood sample.
- 10.4. you analyze the injury history of the wood sample.
- 10.5. you complete the analysis with 70% or more accuracy.

**Learning Objectives**

- 10.a. Identify the four walls that restrict decay in wood.
- 10.b. Locate cambium, xylem, phloem, ray, pith, heartwood, and sapwood parts on a wood sample.
- 10.c. Describe how a tree reacts to a wound.

**11. Advise a client on construction damage avoidance.**

**Linked Program Outcomes**

Communicate as a horticulture professional

**Assessment Strategies**

- 11.1. Written Product
- 11.2. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 11.1. you provide 5 action steps to prevent construction damage to a woodlot prior to residential construction.
- 11.2. you provide 5 action steps to reduce tree stress due to construction activity after construction.
- 11.3. you provide at least 70% of the action steps available to the client.

**Learning Objectives**

- 11.a. Describe how soil compaction damages tree root systems.
- 11.b. Explain how trees are physically damaged during construction.
- 11.c. Prescribe post-construction treatments that improve tree health.
- 11.d. Evaluate tree species' tolerance of construction activity.

**12. Advise a client on a tree health care program.**

**Linked Program Outcomes**

Communicate as a horticulture professional

**Assessment Strategies**

- 12.1. Written Product

**Criteria**

*Your performance will be successful when:*

- 12.1. report addresses the hazardous trees on the property.
- 12.2. report addresses pruning needs.
- 12.3. report addresses tree health needs
- 12.4. report proposes a 3 year timeline to accomplish the proposed work.
- 12.5. report includes a budget.
- 12.6. report includes pictures and a general map.
- 12.7. report is neat and on time.
- 12.8. report is within 70% accurate.

**Learning Objectives**

- 12.a. Describe tree ownership guidelines.
- 12.b. Determine tree health and vigor.