



8764

ADVANCED HORTICULTURE  
(12A)

40S/40E/40M

A Horticulture Course



# 8764: ADVANCED HORTICULTURE (12A)

## 40S/40E/40M

### Course Description

This course is intended for students entering the transition phase of the horticulture program. The curriculum focuses on an integration of learned concepts related to plant propagation, maintenance, growing media, and cultural requirements to maximize plant growth and yields. Students are actively involved in plant care and maintenance.

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**Goal 1:** Describe and apply appropriate **safety** and **health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

- SLO 12A.1.1.1: Describe workplace safety and health procedures (e.g., S.A.F.E., right to refuse). (A3.1)
- SLO 11A.1.1.2: Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)
- SLO 11A.1.1.3: Outline the safety principles for working on and around electrical equipment. (A3.8) (TSA 18)
- SLO 11A.1.1.4: Follow the directions of the teacher/supervisor in regard to safe work practices.
- SLO 11A.1.1.5: Follow safe practices and procedures for facilities, processes, materials, tools, and equipment used in horticulture and landscaping (e.g., keep work area clean and organized). (A3.3)
- SLO 11A.1.1.6: Describe and use appropriate personal protective equipment (PPE) (e.g., gloves, safety glasses or goggles, hearing protection, respirator mask) and identify PPE and procedures related to PPE. (A3.2) (TSA 16)
- SLO 11A.1.1.7: Locate the first aid and eyewash stations.
- SLO 11A.1.1.8: Identify the process for reporting injuries.
- SLO 11A.1.1.9: Identify ergonomically correct procedures to avoid injury (e.g., stress, strain, lifting).
- SLO 11A.1.1.10: Identify and outline workplace fire safety principles. (A3.10) (TSA 19)
- SLO 11A.1.1.11: Identify emergency evacuation and response procedures.

- SLO 11A.1.1.12: Identify potential hazards with regard to personal apparel and grooming.
  - SLO 11A.1.1.13: Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)
  - SLO 11A.1.1.14: Describe the purpose of Material Safety Data Sheets (MSDS).
  - SLO 11A.1.1.15: Demonstrate knowledge of the need and purpose of safe handling and application of chemical controls according to the label. (A3.4, A3.14)
  - SLO 11A.1.1.16: Identify the hazards associated with working in a confined space and the preparation required to work safely in a confined space. (A3.9) (TSA 20)
  - SLO 11A.1.1.17: Identify the hazards and precautions related to working with and around horticulture and landscaping equipment, including ladders and scaffolding. (A3.8)
  - SLO 11A.1.1.18: Identify the need for a safety checklist in the landscaping and horticulture industries (e.g., chainsaw, power lawnmower, garden tractor).
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**GLO 1.2:** Demonstrate knowledge of the **Trade Safety Awareness Manual** (<[www.gov.mb.ca/tce/apprent/apprentice/trade\\_safety/](http://www.gov.mb.ca/tce/apprent/apprentice/trade_safety/)>).

- SLO 12A.1.2.1: Explain the importance of trade safety and health in reducing injuries and fatalities to young employees in Manitoba. (TSA 1)
- SLO 12A.1.2.2: Describe the rights and responsibilities of employees, employers, and supervisors under the Workplace Safety and Health Act. (TSA 2)
- SLO 12A.1.2.3: Describe the steps to use in the Right to Refuse process. (TSA 3)
- SLO 12A.1.2.4: Explain how and where to find information on workplace safety and health. (TSA 4)
- SLO 12A.1.2.5: Demonstrate how to handle a potentially dangerous work situation. (TSA 5)
- SLO 12A.1.2.6: Explain the S.A.F.E. acronym. (TSA 6)
- SLO 12A.1.2.7: Define workplace safety and health hazards. (TSA 7)
- SLO 12A.1.2.8: Give examples of trade-specific workplace safety and health hazards. (TSA 8)
- SLO 1.12A.2.9: Give examples of five types of safety and health hazards. (TSA 9)

- SLO 12A.1.2.10: Define workplace safety and health risks. (TSA 10)
- SLO 12A.1.2.11: Give examples of trade-specific workplace safety and health risks. (TSA 11)
- SLO 12A.1.2.12: Explain the principles of hazard recognition and control as they apply to the specific trade. (TSA 12)
- SLO 12A.1.2.13: Match the WHMIS hazardous materials symbols and their meanings. (TSA 14)
- SLO 12A.1.2.14: Describe the importance of the Material Safety Data Sheets (MSDS). (TSA 15)
- SLO 12A.1.2.15: Demonstrate proper selection and use of a variety of personal protective equipment and fall-protection systems. (TSA 17)
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**Goal 2: Demonstrate the safe and appropriate **maintenance, management, and operation of equipment, tools, consumables, and materials.** (GHCP B3)**

**GLO 2.1: Demonstrate the safe and appropriate **maintenance and management of equipment, tools, consumables, and materials.****

- SLO 12A.2.1.1: Demonstrate the safe and appropriate maintenance and management of equipment, tools, consumables, and materials.
- SLO 12A.2.1.2: Demonstrate an awareness of safe handling and applications of chemical controls according to the label.
- SLO 12A.2.1.3: Develop a safety checklist related to landscaping and horticulture (e.g., chainsaw, power lawnmower, garden tractor).
- SLO 12A.2.1.4: Describe the procedures and equipment used to store, dispose of, and transport fertilizers. (D1.8)
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**GLO 2.2: Demonstrate the safe **operation of horticultural tools and equipment.****

- SLO 12A.2.2.1: Demonstrate the safe operation of horticultural tools and equipment.
- SLO 12A.2.2.2: Demonstrate the ability to select and use measuring and hand tools, and power equipment for a task. (A4.3, A4.5, A4.7)
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**Goal 3: Demonstrate an understanding of the fundamentals of horticulture.**

**GLO 3.1: Demonstrate a basic understanding of plant anatomy, morphology, and physiology.**

- SLO 12A.3.1.1: Describe plant anatomy and morphology.
  - SLO 12A.3.1.2: Describe the factors that impact plant growth and development.
  - SLO 12A.3.1.3: Describe taxonomy and the binomial system of naming plants.
  - SLO 12A.3.1.4: Identify plants by common and botanical names, and family names.
  - SLO 12A.3.1.5: Design and plant container gardens.
  - SLO 12A.3.1.6: Identify plant nutrients and describe the impact of nutrient deficiencies/excesses on plants and plant growth. (B2.5)
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**GLO 3.2: Identify and select plants.**

- SLO 12A.3.2.1: Describe the characteristics of plants that influence their use. (A6.3)
  - SLO 12A.3.2.2: Describe how each species is used in horticulture. (A6.3) (GHCP A4)
  - SLO 12A.3.2.3: Describe the environmental conditions for the optimal growth of each species.
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**GLO 3.3: Demonstrate an understanding of plant care. (GHCP B2)**

- SLO 12A.3.3.1: Perform the maintenance of plants in a container garden.
  - SLO 12A.3.3.2: Describe the procedures and equipment used for the application of fertilizers. (D1.7)
  - SLO 12A.3.3.3: Calibrate application equipment. (D1.9)
  - SLO 12A.3.3.4: Identify types of fertilizers and describe their characteristics and applications. (D1.4)
  - SLO 12A.3.3.5: Describe the analysis and formulation of fertilizers. (D1.6)
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**Goal 4: Demonstrate an understanding of soils and growing media.**

**GLO 4.1: Demonstrate an understanding of soils and growing media.**

- SLO 12A.4.1.1: Demonstrate knowledge of and utilize soil science terminology.
  - SLO 12A.4.1.2: Apply knowledge of the physical characteristics of soil when determining suitability for plant growth. (A9.1)
  - SLO 12A.4.1.3: Apply knowledge of the types of media, their characteristics, and their applications when growing plants. (A9.3)
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**GLO 4.2: Demonstrate knowledge of the effects of soils and growing media on plants. (GHCP A7)**

- SLO 12A.4.2.1: Apply the chemical and biological properties of soils and growing media when growing plants. (A9.4)
  - SLO 12A.4.2.2: Apply knowledge of the process of soil water and nutrient uptake by roots when growing plants.
  - SLO 12A.4.2.3: Apply knowledge of the atmospheric conditions that influence soil water availability when growing plants.
  - SLO 12A.4.2.4: Describe the process of soil water and nutrient uptake by roots.
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**Goal 5: Understand pest management.**

**GLO 5.1: Understand the principles of integrated pest management.**

- SLO 12A.5.1.1: Describe the significance of pests.
  - SLO 12A.5.1.2: Describe pest biology in terms of IPM.
  - SLO 12A.5.1.3: Identify common pests.
  - SLO 12A.5.1.4: Identify damage caused by pests.
  - SLO 12A.5.1.5: Describe the difference between IPM and conventional pest management.
  - SLO 12A.5.1.6: Describe the ecological concepts related to IPM.
  - SLO 12A.5.1.7: Describe pest control techniques.
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**Goal 6:** Demonstrate an understanding of the principles of **plant installation and propagation.**

**GLO 6.1:** Demonstrate an understanding of the principles of **plant installation and propagation.**

SLO 12A.6.1.1: Install plant material. (GHCP B1)

SLO 12A.6.1.2: Demonstrate different methods of plant propagation.

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**Goal 7:** Demonstrate an understanding of the principles of **crop production and management.**

**GLO 7.1:** Demonstrate an understanding of **crop production.**

No applicable SLOs.

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**GLO 7.2:** Demonstrate an understanding of **crop management.**

No applicable SLOs.

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**Goal 8:** Demonstrate an understanding of the **construction techniques** relevant to the horticulture industry.

**GLO 8.1:** Identify and demonstrate different **construction techniques.**

No applicable SLOs.

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**Goal 9:** Understand **career opportunities** in horticulture and related environmental fields. (GHCP D1)

**GLO 9.1:** Describe **education and career opportunities, and professional organizations** in horticulture and related environmental fields.

SLO 12A.9.1.1: Describe education and career opportunities, and professional organizations in horticulture and related environmental fields.

SLO 12A.9.1.2: Prepare and deliver an informal presentation related to an industrial topic. (A10.6)

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**Goal 10:** Describe and demonstrate the transferable, **cross-curricular** knowledge and skills as they pertain to horticulture.

**GLO 10.1:** **Read, interpret, and communicate** information relevant to horticulture.

SLO 12A.10.1.1: Read, interpret, and communicate information relevant to horticulture.

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**GLO 10.2:** Apply **mathematics** knowledge and skills relevant to horticulture.

No applicable SLOs.

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**GLO 10.3:** Apply **other subject areas** (art, physical education/health education) knowledge and skills relevant to horticulture.

No applicable SLOs.

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**Goal 11:** Demonstrate an awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

No applicable SLOs.

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**GLO 11.2:** Describe the horticulture industry's **sustainability practices and environmental impacts**.

SLO 12A.11.2.1: Describe sustainability practices and the environmental impacts of horticulture (e.g., xeriscaping, water gardens).

SLO 12A.11.2.2: Describe the implications of soil management on the practice of environmental stewardship. (A9.2)

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

No applicable SLOs.

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**Goal 12:** Demonstrate an awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

SLO 12A.12.1.1: Demonstrate awareness of legislation controlling the use of horticultural products.

SLO 12A.12.1.2: Discuss ethical considerations regarding the disposal of hazardous products.

SLO 12A.12.1.3: Interpret codes and regulations pertaining to fertilizers. (D1.5)

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**Goal 13:** Demonstrate **employability skills** related to horticulture. (GHCP D1) (GHCP D4)

**GLO 13.1:** Demonstrate **fundamental employability skills**.

SLO 12A.13.1.1: Arrive on time and be prepared for work.

SLO 12A.13.1.2: Meet deadlines.

SLO 12A.13.1.3: Use time effectively.

SLO 12A.13.1.4: Follow written and oral directions.

SLO 12A.13.1.5: Ask questions for clarification.

SLO 12A.13.1.6: Initiate work independently.

SLO 12A.13.1.7: Work effectively without supervision.

SLO 12A.13.1.8: Complete tasks without supervision.

SLO 12A.13.1.9: Fulfill commitments to self and others.

SLO 12A.13.1.10: Perform tasks to a high standard.

SLO 12A.13.10.11: Cooperate with others.

SLO 12A.13.10.12: Act respectfully towards oneself and others.

SLO 12A.13.10.13: Participate in group activities.

SLO 12A.13.10.14: Dress appropriately for the workplace.

SLO 12A.13.10.15: Demonstrate appropriate site etiquette. (GHCP D3)

SLO 12A.13.10.16: Maintain a clean and organized work area. (A3.3)

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**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends in** horticulture.

**GLO 14.1:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends in** horticulture.

SLO 12A.14.1.1: Describe the evolution and technological progression of, and the emerging trends in horticulture.

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