

# Apprenticeship and Industry Training

---

## Landscape Horticulturist Apprenticeship Course Outline

047 (2019)



Apprenticeship  
and Industry  
Training

**ALBERTA ADVANCED EDUCATION**

***Landscape horticulturist: apprenticeship course outline***

ISBN 978-1-4601-4350-6 (PDF)

ALL RIGHTS RESERVED:

© 2019, Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Alberta Advanced Education, 10th floor, Commerce Place, Edmonton, Alberta, Canada, T5J 4L5. All rights reserved. No part of this material may be reproduced in any form or by any means, without the prior written consent of the Minister of Advanced Education Province of Alberta, Canada.

**Landscape Horticulturist  
Table of Contents**

**Landscape Horticulturist Table of Contents ..... 1**  
**Apprenticeship ..... 2**  
**Apprenticeship and Industry Training System ..... 2**  
**Apprenticeship Safety ..... 4**  
**Procedures for Recommending Revisions to the Course Outline..... 5**  
**Apprenticeship Route toward Certification ..... 6**  
**Landscape Horticulturist Training Profile ..... 7**

**COURSE OUTLINE**

**First Period Technical Training..... 11**  
**Second Period Technical Training..... 19**  
**Third Period Technical Training..... 26**  
**Fourth Period Technical Training ..... 33**

## **Apprenticeship**

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyman or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeymen, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Landscape Horticulturist Provincial Apprenticeship Committee.

The graduate of the Landscape Horticulturist apprenticeship program is a certified journeyman who will be able:

- practice environmental stewardship principles,
- consult with clients on all aspects of landscaping,
- provide advice to customers on plant selection and care,
- use trade-related tools and equipment,
- identify plants and evaluate plant health,
- install and maintain turfgrass,
- trim and prune hedges, trees and shrubs,
- mitigate plant diseases and insect problems,
- apply fertilizers and pesticides,
- amend poor soil conditions,
- assess and prepare construction sites,
- construct and maintain landscape structures,
- install ponds and drainage systems,
- install retaining walls, paths and patios,
- install operate and maintain irrigation systems, and
- work in all aspects of greenhouse and nursery production.

## **Apprenticeship and Industry Training System**

### **Industry-Driven**

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

### **Alberta Apprenticeship and Industry Training Board**

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

## Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

### Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

### Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
  - standards and requirements for training and certification in their trade
  - courses and examinations in their trade
  - apprenticeship and certification
  - designation of trades and occupations
  - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

### Landscape Horticulturist PAC Members at the Time of Publication

Mr. B. Kay .....	Water Valley .....	Presiding Officer
Mr. J. Voogd .....	Edmonton .....	Employer
Mr. P Atkinson .....	Calgary .....	Employer
Mr. D. Carruthers .....	Calgary .....	Employer
Mr. T. Kennedy .....	Edmonton .....	Employer
Ms. K. Hutchison .....	Spruce Grove .....	Employee
Mr. A. Phillips .....	Calgary .....	Employee
Ms. D. Beaunoyer .....	Beaumont .....	Employee
Mr. C. Humeny .....	Edmonton .....	Employee

## Alberta Government

Alberta Advanced Education works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

### Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

### Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board (board) fully supports safe learning and working environments and emphasizes the importance of safety awareness and education throughout apprenticeship training- in both on-the- job training and technical training. The board also recognizes that safety awareness and education begins on the first day of on-the-job training and thereby is the initial and ongoing responsibility of the employer and the apprentice as required under workplace health and safety training. However the board encourages that safe workplace behaviour is modeled not only during on-the-job training but also during all aspects of technical training, in particular, shop or lab instruction. Therefore the board recognizes that safety awareness and training in apprenticeship technical training reinforces, but does not replace, employer safety training that is required under workplace health and safety legislation.

The board has established a policy with respect to safety awareness and training:

**The board promotes and supports safe workplaces, which embody a culture of safety for all apprentices, employers and employees. Employer required safety training is the responsibility of the employer and the apprentice, as required under legislation other than the *Apprenticeship and Industry Training Act*.**

The board's complete document on its 'Apprenticeship Safety Training Policy' is available at [www.tradesecrets.alberta.ca](http://www.tradesecrets.alberta.ca); access the website and conduct a search for 'safety training policy'. Implementation of the policy includes three common safety learning outcomes and objectives for all trade course outlines. These common learning outcomes ensure that each course outline utilizes common language consistent with workplace health and safety terminology. Under the title of 'Standard Workplace Safety', this first section of each trade course outline enables the delivery of generic safety training; technical training providers will provide trade specific examples related to the content delivery of course outline safety training.

### Occupational Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Occupational Health and Safety (a division of Alberta Human Services) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at [www.humanservices.alberta.ca](http://www.humanservices.alberta.ca)

## Technical Training

Apprenticeship technical training is delivered by the technical institutes and colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place a strong emphasis on safety that complements safe workplace practices towards the development of a culture of safety for all trades.

The technical institutes and colleges work with Alberta's Apprenticeship and Industry Training Board, industry committees and Alberta Advanced Education to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs across the Province. They develop curriculum from the course outlines established by industry and provide technical training to apprentices.

The following institutions deliver Landscape Horticulturist apprenticeship technical training:  
Olds College

### Procedures for Recommending Revisions to the Course Outline

Advanced Education has prepared this course outline in partnership with the Landscape Horticulturist Provincial Apprenticeship Committee.

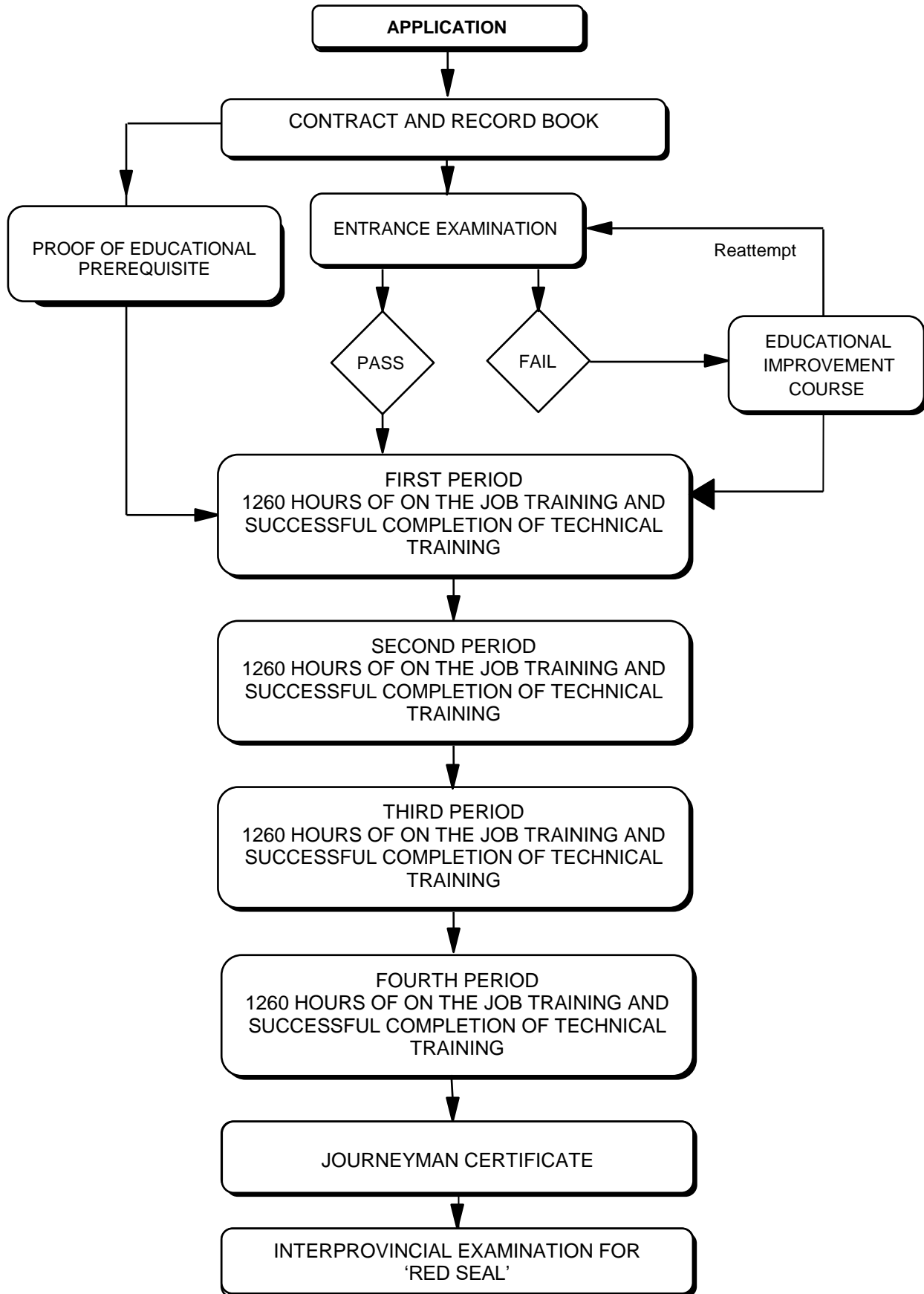
This course outline was approved on May 11, 2018 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Landscape Horticulturist Provincial Apprenticeship Committee  
c/o Industry Programs and Standards  
Apprenticeship and Industry Training  
Advanced Education  
10th floor, Commerce Place  
10155 102 Street NW  
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Landscape Horticulturist Provincial Apprenticeship Committee.

### Apprenticeship Route toward Certification





**Landscape Horticulturist Training Profile**  
**FIRST PERIOD**  
**(8 Weeks 30 Hours per Week – Total of 240 Hours)**

**SECTION ONE**

<b>WORKPLACE SAFETY AND OCCUPATIONAL SKILLS</b> 14 HOURS	⇒	<b>A</b> Safety Legislation, Regulations and Industry Policy in the Trades 4 Hours	<b>B</b> Climbing, Lifting, Rigging and Hoisting 2 Hours	<b>C</b> Hazardous Materials and Fire Protection 2 Hours
		<b>D</b> Apprenticeship Training Program 2 Hours	<b>E</b> Communication 4 Hours	

**SECTION TWO**

<b>TOOLS, EQUIPMENT AND VEHICLES</b> 34 HOURS	⇒	<b>A</b> Hand and Power Tools 6 Hours	<b>B</b> Equipment Maintenance and Operation 8 Hours	<b>C</b> Hydraulic Systems 5 Hours
		<b>D</b> Heavy Equipment, Trailers and Attachments 5 Hours	<b>E</b> Commercial Vehicle Operation 6 Hours	<b>F</b> Transport Equipment 2 Hours

<b>G</b> Transport Materials 2 Hours		
--------------------------------------------	--	--

**SECTION THREE**

<b>SITE ASSESSMENT, GRADING AND DRAINAGE</b> 22 HOURS	⇒	<b>A</b> Pre-Construction Site Assessment 4 Hours	<b>B</b> Site Locates 2 Hours	<b>C</b> Grading 10 Hours
		<b>D</b> Drainage Systems 6 Hours		

**SECTION FOUR**

<b>PLANT PROPERTIES, GRASSLAND AND PARKLAND</b> 74 HOURS	⇒	<b>A</b> Botany 38 Hours	<b>B</b> Taxonomy 12 Hours	<b>C</b> Grassland and Parkland 24 Hours

**SECTION FIVE**

<b>SOIL AND WATER</b> 60 HOURS	⇒	<b>A</b> Environmental Stewardship 6 Hours	<b>B</b> Soils 44 Hours	<b>C</b> Water Quality 6 Hours
		<b>D</b> Growing Media 4 Hours		

**SECTION SIX**

<b>TURFGRASS AND EXTERIOR SOFTSCAPE MAINTENANCE</b> 36 HOURS	⇒	<b>A</b> Turfgrass Installation 8 Hours	<b>B</b> Turfgrass Maintenance 12 Hours	<b>C</b> Fertilization 14 Hours
		<b>D</b> Exterior Softscape Maintenance 2 Hours		

**SECOND PERIOD**  
**(8 Weeks 30 Hours per Week – Total of 240 Hours)**

**SECTION ONE**

<b>SURVEYING AND SITE ASSESSMENT</b> 32 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Surveying and Site Assessment 22 Hours	Construction Site Preparation 4 Hours	Materials and Equipment Logistics 2 Hours
	<b>D</b>		
	Professional Practice 4 Hours		

**SECTION TWO**

<b>CONSERVATION</b> 24 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Environmental Conservation 6 Hours	Water Conservation 12 Hours	Soil Conservation 6 Hours

**SECTION THREE**

<b>HARDSCAPE INSTALLATION AND MAINTENANCE</b> 70 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Site Risk Mitigation 4 Hours	Aggregate Surface Materials and Artificial Turf 8 Hours	Steps and Retaining Walls 16 Hours
	<b>D</b>	<b>E</b>	<b>F</b>
	Drainage Systems Maintenance 4 Hours	Modular and Natural Stone 16 Hours	Timber Construction 22 Hours

**SECTION FOUR**

<b>PHYSIOLOGY, BOREAL, MONTANE AND WETLAND PLANTS</b> 40 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Physiology 16 Hours	Boreal Forests 6 Hours	Montane 6 Hours
	<b>D</b>		
	Wetlands 12 Hours		

**SECTION FIVE**

<b>LANDSCAPE PESTS</b> 50 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Integrated Pest Management 8 Hours	Weed Management 12 Hours	Disease Management 10 Hours
	<b>D</b>	<b>E</b>	
	Insect and Animal Management 12 Hours	Pesticides 8 Hours	

**SECTION SIX**

<b>SOFTSCAPE INSTALLATION AND PRUNING</b> 24 HOURS	<b>A</b>	<b>B</b>	<b>C</b>
	Woody Plant Installation 8 Hours	Mulch Installation 2 Hours	Pruning Techniques 14 Hours

**THIRD PERIOD**  
**(8 Weeks 30 Hours per Week – Total of 240 Hours)**

<b>SECTION ONE</b>				
<b>PROJECT MANAGEMENT</b> 20 HOURS	⇒	<b>A</b> Customer Service 4 Hours	<b>B</b> Job Planning 10 Hours	<b>C</b> Inventory Controls 6 Hours
<b>SECTION TWO</b>				
<b>LANDSCAPE CONSTRUCTION AND IRRIGATION</b> 68 HOURS	⇒	<b>A</b> Water Features 12 Hours	<b>B</b> Landscape Lighting 8 Hours	<b>C</b> Irrigation System Principles and Operation 38 Hours
		<b>D</b> Irrigation System Maintenance and Repair 10 Hours		
<b>SECTION THREE</b>				
<b>SOFTSCAPE MAINTAINANCE</b> 24 HOURS	⇒	<b>A</b> Softscape Repair 4 Hours	<b>B</b> Interior Landscape Plant Installation 8 Hours	<b>C</b> Interior Landscape Plant Maintenance 4 Hours
		<b>D</b> Snow and Ice Control 4 Hours	<b>E</b> Landscape Structures Maintenance 4 Hours	
<b>SECTION FOUR</b>				
<b>SUSTAINABLE HORTICULTURAL PRACTICES</b> 40 HOURS	⇒	<b>A</b> Environmental Practices 4 Hours	<b>B</b> Introduced Herbaceous Plants 20 Hours	<b>C</b> Introduced Woody Plants 16 Hours
<b>SECTION FIVE</b>				
<b>URBAN FORESTRY AND ARBORICULTURE</b> 58 HOURS	⇒	<b>A</b> Tree Physiology 6 Hours	<b>B</b> Tree Establishment and Independence 22 Hours	<b>C</b> Tree Assessment 6 Hours
		<b>D</b> Tree Protection 8 Hours	<b>E</b> Tree Pruning 8 Hours	<b>F</b> Tree Removal 8 Hours
<b>SECTION SIX</b>				
<b>GROWING FACILITIES</b> 30 HOURS	⇒	<b>A</b> Growing Facilities and Components 20 Hour	<b>B</b> Growing Facility Operation 4 Hours	<b>C</b> Sanitary Environments 6 Hours

**Fourth Period  
(8 Weeks 30 Hours per Week – Total of 240 Hours)**

<b>SECTION ONE</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>BUSINESS ADMINISTRATION</b> 14 HOURS	Post Construction Site Assessment 4 Hours	Scheduling 4 Hours	Workplace Coaching Skills 2 Hours
	<b>D</b>	<b>E</b>	
	Alberta's Industry Network 2 Hours	Interprovincial Standards Red Seal Program 2 Hours	
<b>SECTION TWO</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>CONTRACT MANAGEMENT</b> 42 HOURS	Estimating 20 Hours	Contract Security Measures 8 Hours	Tendering and Contracts 14 Hours
<b>SECTION THREE</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>LANDSCAPE DESIGN</b> 70 HOURS	Design Principles and Elements 16 Hours	Drafting 10 Hours	Design Process 34 Hours
	<b>D</b>		
	Construction Plans 10 Hours		
<b>SECTION FOUR</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>SUSTAINABLE LANDSCAPE TECHNOLOGIES</b> 28 HOURS	Environmental Ethics 4 Hours	Green Roofs 8 Hours	Living Walls 4 Hours
	<b>D</b>	<b>E</b>	
	Rainwater Management 8 Hours	Erosion Control 4 Hours	
<b>SECTION FIVE</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>SPECIALTY CROPS</b> 38 HOURS	Edible Fruit Species 12 Hours	Vines 4 Hours	Geophytes 8 Hours
	<b>D</b>	<b>E</b>	
	Bedding Plants 8 Hours	Ornamental Grasses 6 Hours	
<b>SECTION SIX</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>NURSERY PRODUCTION AND GREENHOUSE CROPS</b> 48 HOURS	Propagation 16 Hours	Transplanting 6 Hours	Growing On 8 Hours
	<b>D</b>	<b>E</b>	
	Harvesting 6 Hours	Winterizing 6 Hours	Grading and Shipping 6 Hours

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

**FIRST PERIOD TECHNICAL TRAINING  
LANDSCAPE HORTICULTURIST TRADE  
COURSE OUTLINE**

*UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.*

**SECTION ONE:..... WORKPLACE SAFETY AND OCCUPATIONAL SKILLS..... 14 HOURS**

**A. Safety Legislation, Regulations & Industry Policy in the Trades ..... 4 Hours**

**Outcome:**     ***Apply legislation, regulations and practices ensuring safe work in this trade.***

1.     Demonstrate the application of the Occupational Health and Safety Act, Regulation and Code.
2.     Describe the employer's and employee's role with Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations and related advisory bodies and agencies.
3.     Describe industry practices for hazard assessment and control procedures.
4.     Describe the responsibilities of worker and employers to apply emergency procedures.
5.     Describe tradesperson attitudes with respect to housekeeping, personal protective equipment (PPE) and emergency procedures.
6.     Describe the roles and responsibilities of employers and employees with the selection and use of PPE.
7.     Explain required PPE for tasks.
8.     Explain training sign-off sheets.

**B. Climbing, Lifting, Rigging and Hoisting ..... 2 Hours**

**Outcome:**     ***Use industry standard practices for climbing, lifting, rigging and hoisting in this trade.***

1.     Describe manual lifting procedures.
2.     Describe rigging hardware and associated safety factors.
3.     Describe workplace ergonomics.
4.     Describe selecting equipment for rigging loads.
5.     Describe hoisting and load moving procedures.
6.     Describe maintenance of personal protective equipment (PPE) for climbing, lifting and load moving equipment.
7.     Describe PPE for climbing, lifting and load moving equipment.

**C. Hazardous Materials & Fire Protection ..... 2 Hours**

**Outcome:** *Apply industry standard practices for hazardous materials and fire protection in this trade.*

1. Describe roles, responsibilities, features and practices related to the Workplace Hazardous Materials Information System (WHMIS) program.
2. Describe three key elements of WHMIS.
3. Describe handling, storing and transporting procedures for hazardous material.
4. Describe venting procedures when working with hazardous materials.
5. Describe hazards, classes, procedures and equipment related to fire protection.
6. Describe clean-up procedures for hazardous materials.

**D. Apprenticeship Training Program ..... 2 Hours**

**Outcome:** *Manage an apprenticeship to earn journeyman certification.*

1. Describe the contractual responsibilities of the apprentice, employer and Alberta Apprenticeship and Industry Training.
2. Describe the purpose of the apprentice record book.
3. Describe the procedure for changing employers during an active apprenticeship.
4. Describe the purpose of the course outline.
5. Describe the procedure for progressing through an apprenticeship.
6. Describe advancement opportunities in this trade.
7. Describe responsibilities for practitioners of the Landscape Horticulturist trade.

**E. Communication..... 4 Hours**

**Outcome:** *Use communication strategies.*

1. Describe non-verbal communication strategies and techniques.
2. Describe verbal communication strategies and techniques.
3. Describe interpersonal communication principles to build and maintain relationships.
4. Describe gender and ethnic awareness when communicating.
5. Develop industry specific written documents.
6. Demonstrate communication strategies and techniques.

**SECTION TWO:..... TOOLS, EQUIPMENT AND VEHICLES..... 34 HOURS****A. Hand and Power Tools..... 6 Hours**

**Outcome:** *Use trade related tools.*

1. Identify types of hand tools.
2. Identify types of power tools.
3. Describe tool sign-out sheets.
4. Explain use of hand tools.
5. Explain use of power tools.
6. Explain tool maintenance.

**B. Equipment Maintenance and Operation..... 8 Hours****Outcome: Use equipment.**

1. Identify engine components.
2. Identify types of engines.
3. Describe the operating principles of engines.
4. Describe applications for using outdoor power equipment.
5. Describe engine systems maintenance.
6. Describe three-point hitches.
7. Describe the components of Power-Take-Off (PTO) coupler shafts.
8. Describe machinery protection features.
9. Describe belt and chain drive systems.
10. Explain equipment maintenance schedules.
11. Demonstrate equipment operation.
12. Demonstrate equipment maintenance.

**C. Hydraulic Systems ..... 5 Hours****Outcome: Maintain hydraulic systems.**

1. Describe types of hydraulic fluids.
2. Describe hydraulic principles.
3. Describe hydraulic systems.
4. Describe procedures for locating leaks.
5. Describe hydraulic test procedures.
6. Explain hydraulic system operation.
7. Explain troubleshooting operational problems.
8. Explain hydraulic system maintenance.

**D. Heavy Equipment, Trailers and Attachments ..... 5 Hours****Outcome: Operate heavy equipment.**

1. Describe industry related heavy equipment.
2. Describe procedures for working in and around heavy equipment.
3. Describe heavy equipment steering mechanisms.
4. Describe heavy equipment attachments.
5. Demonstrate hand signals for working in and around heavy equipment.
6. Perform heavy equipment inspections.

**E. Commercial Vehicle Operation ..... 6 Hours**

**Outcome: Operate commercial vehicles.**

1. Identify requirements to operate a commercial vehicle.
2. Describe use of hazard warning devices.
3. Describe regulatory codes for operation of a commercial vehicle.
4. Demonstrate use of logbooks.
5. Perform safety checks on commercial vehicles.
6. Perform commercial vehicle pre-trip and post-trip inspections.

**F. Transport Equipment ..... 2 Hours**

**Outcome: Transports equipment.**

1. Identify equipment transportation hazards.
2. Describe vehicle, trailer and equipment combination selection.
3. Describe jurisdictional regulations for securing and transporting equipment.
4. Describe vehicle and trailer signage for oversized loads.
5. Describe routing for transportation.
6. Explain equipment transportation documentation.

**G. Transport Materials ..... 2 Hours**

**Outcome: Transports materials.**

1. Identify material transportation hazards.
2. Describe the procedures used for transporting materials.
3. Describe securing and covering materials.
4. Explain material transportation documentation.

**SECTION THREE: ..... SITE ASSESSMENT, GRADING AND DRAINAGE ..... 22 HOURS**

**A. Pre-Construction Site Assessment ..... 4 Hours**

**Outcome: Perform pre-construction site assessment.**

1. Identify site hazards.
2. Identify existing conditions.
3. Identify security requirements.
4. Identify site access.
5. Describe site-specific information required to complete project tasks.
6. Perform visual inspection of site and neighbouring properties.
7. Perform site a hazard assessment.



**B. Site Locates..... 2 Hours**

**Outcome:** *Interpret utility locates.*

1. Identify areas to be excavated and protected.
2. Identify septic system and well locations.
3. Explain above and below ground utility locates.

**C. Grading..... 10 Hours**

**Outcome:** *Perform site grading.*

1. Describe grade certificates.
2. Describe grade illustrations on a plan.
3. Describe technologies used to assist in grading.
4. Develop a site drainage plan.
5. Perform slope calculations for site grading.
6. Perform cut and fill calculations.
7. Perform site grading.

**D. Drainage Systems ..... 6 Hours**

**Outcome:** *Install drainage systems.*

1. Identify surface drainage systems.
2. Identify sub-surface drainage systems.
3. Describe drainage system backfill.
4. Develop drainage system layouts.
5. Demonstrate building a drainage system.

**SECTION FOUR: .....PLANT PROPERTIES, GRASSLAND AND PARKLAND..... 74 HOURS**

**A. Botany..... 38 Hours**

**Outcome:** *Evaluate plant health.*

1. Identify cell components.
2. Explain cell characteristics.
3. Explain tissue characteristics.
4. Explain stem characteristics.
5. Explain leaf characteristics.
6. Explain root characteristics.
7. Explain flower characteristics.
8. Explain fruit characteristics.
9. Explain monocot and dicot characteristics.
10. Explain plant life cycles.

**B. Taxonomy..... 12 Hours**

**Outcome:**     *Use the botanic classification system for plant identification.*

1.     Explain the botanic classification system.
2.     Explain plant family characteristics.
3.     Demonstrate plant use in the landscape.
4.     Demonstrate use of plant identification resources.
5.     Demonstrate use of taxonomic keys.

**C. Grassland and Parkland ..... 24 Hours**

**Outcome:**     *Use plants from the grassland and parkland ecosystems.*

1.     Identify regional ecosystems.
2.     Describe grassland and parkland ecosystem characteristics.
3.     Describe requirements of plants from the grassland and parkland ecosystems.
4.     Demonstrate use of plants from the grassland and parkland ecosystems.
5.     Demonstrate use of related grassland and parkland species.

**SECTION FIVE: .....SOIL AND WATER..... 60 HOURS**

**A. Environmental Stewardship ..... 6 Hours**

**Outcome:**     *Use environmental stewardship principles.*

1.     Identify trends in sustainability.
2.     Identify principles of permaculture.
3.     Describe low impact development.
4.     Describe urban heat island effect.

**B. Soils ..... 44 Hours**

**Outcome:**     *Manage soil health.*

1.     Describe soil properties.
2.     Describe soil components.
3.     Describe natural soil formation.
4.     Describe effects of soil properties on plant growth.
5.     Describe essential plant nutrients.
6.     Describe impacts of compaction on soil health.
7.     Explain the role of soil biota.
8.     Explain the nitrogen cycle.
9.     Explain plant nutrient availability.
10.    Explain regional compost quality standards.
11.    Explain soil sampling.
12.    Develop soil amendment recommendations.
13.    Demonstrate interpretation of a soil test.

**C. Water Quality.....6 Hours**

**Outcome:     *Manage water quality for plant health.***

1.     Identify water characteristics influencing plant health.
2.     Identify jurisdictional regulations relating to water stewardship.
3.     Describe water stewardship methods.
4.     Describe water pollutants.
5.     Perform water quality tests.

**D. Growing Media..... 4 Hours**

**Outcome:     *Use soilless media.***

1.     Describe components of soilless media.
2.     Describe amendments of soilless media.
3.     Demonstrate blending soilless media.

**SECTION SIX:..... TURFGRASS AND EXTERIOR SOFTSCAPE MAINTENANCE..... 36 HOURS**

**A. Turfgrass Installation ..... 8 Hours**

**Outcome:     *Installs turfgrass.***

1.     Describe turfgrass characteristics.
2.     Describe seed establishment.
3.     Describe sod establishment.
4.     Demonstrate turfgrass installation.
5.     Perform seeding rate calculations.

**B. Turfgrass Maintenance ..... 12 Hours**

**Outcome:     *Maintains turfgrass.***

1.     Describe turfgrass growth cycles.
2.     Describe turfgrass water management.
3.     Describe mowing techniques.
4.     Describe fertilization programs.
5.     Describe thatch management.
6.     Describe the effect of soil compaction on turfgrass.

**C. Fertilization..... 14 Hours**

**Outcome:     *Apply fertilizer.***

1.     Explain fertilizer selection.
2.     Explain fertilizer formulations.
3.     Explain fertilizer analyses.
4.     Explain nutrient deficiencies.
5.     Explain fertilizer application methods.

6. Develop a landscape fertilization program.
7. Perform fertilizer application calculations.

**D. Exterior Softscape Maintenance ..... 2 Hours**

**Outcome:      *Perform exterior softscape maintenance.***

1. Describe visual inspections of plant health.
2. Describe weeding techniques.
3. Describe cultivation techniques.
4. Describe bed-edging techniques.
5. Describe bedding plant maintenance and removal.
6. Describe use of seasonal protection.
7. Describe hardening-off practices.

**SECOND PERIOD TECHNICAL TRAINING  
LANDSCAPE HORTICULTURIST TRADE  
COURSE OUTLINE**

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

**SECTION ONE:.....SURVEYING AND SITE ASSESSMENT ..... 32 HOURS**

**A. Surveying .....22 Hours**

**Outcome:      *Conduct a site survey.***

1.      Describe surveying.
2.      Describe measuring equipment calibration.
3.      Describe grading plans.
4.      Demonstrate the use of scale on working drawings.
5.      Develop a base map.
6.      Demonstrate interpretation of Real Property Reports.
7.      Perform a site survey.

**B. Construction Site Preparation..... 4 Hours**

**Outcome:      *Prepare a construction site.***

1.      Describe construction site preparation.
2.      Perform interpretation of drawings and documentation.
3.      Perform site layout staking.

**C. Materials and Equipment Logistics ..... 2 Hours**

**Outcome:      *Coordinate site layout.***

1.      Explain site staging.
2.      Explain materials coordination.
3.      Explain equipment coordination.

**D. Professional Practice ..... 4 Hours**

**Outcome:      *Maintain relationships with stakeholders.***

1.      Identify characteristics of professional behaviour.
2.      Describe professionalism when working with external stakeholders.
3.      Describe principles of customer service.

**SECTION TWO: ..... CONSERVATION ..... 24 HOURS**

**A. Environmental Conservation ..... 6 Hours**

**Outcome: Practice environmental conservation.**

1. Identify environmental impacts.
2. Explain environmental waste management practices.
3. Explain practices for maximizing green space and permeable surfaces.
4. Explain use of renewable resources.
5. Explain environmental conservation.

**B. Water Conservation ..... 12 Hours**

**Outcome: Practice water conservation.**

1. Describe natural wetlands.
2. Describe constructed wetlands.
3. Describe hydrology of wetlands.
4. Describe riparian restoration.
5. Describe reclaimed water systems.
6. Explain regulatory requirements for water use.
7. Explain concepts and technology used to conserve water.
8. Explain endangered species protection in waterways.
9. Explain mitigation of invasive species in waterways.
10. Explain prevention of pollutants from reaching waterways.
11. Explain rainwater mitigation.

**C. Soil Conservation ..... 6 Hours**

**Outcome: Practice soil conservation.**

1. Explain soil stewardship methods.
2. Explain soil horizon protection.
3. Explain soil storage methods.
4. Explain compaction mitigation.
5. Explain cultivation impact on soil structure.

**SECTION THREE: ..... HARDSCAPE INSTALLATION AND MAINTENANCE ..... 70 HOURS**

**A. Site Risk Mitigation ..... 4 Hours**

**Outcome: Mitigate site risks.**

1. Describe the Certificate of Recognition (COR) program.
2. Explain safe operating practices and procedures.
3. Explain a critical task list.
4. Explain safety meeting record keeping.

5. Demonstrate leading safety meetings.
6. Perform a physical demands analysis of a task.

**B. Aggregate Surface Materials and Artificial Turf ..... 8 Hours**

**Outcome:** *Install surface materials.*

1. Identify types of surface materials.
2. Identify subgrade and base materials.
3. Describe aggregate surface material installation.
4. Describe aggregate surface material maintenance.
5. Describe artificial turf installation.
6. Describe artificial turf maintenance.

**C. Steps and Retaining Walls..... 16 Hours**

**Outcome:** *Install retaining walls.*

1. Describe natural stone retaining wall systems.
2. Describe modular retaining wall systems.
3. Describe timber retaining wall systems.
4. Describe design factors for retaining wall construction.
5. Describe types of steps.
6. Describe step integration in retaining walls.
7. Describe steps and retaining wall maintenance.
8. Describe codes and regulations for retaining walls.
9. Demonstrate modular retaining wall system installation.

**D. Drainage Systems Maintenance..... 4 Hours**

**Outcome:** *Maintain drainage systems.*

1. Describe winterization procedures.
2. Explain sediment impact on drainage systems.
3. Explain rainwater retention systems.
4. Explain drainage system maintenance.

**E. Modular and Natural Stone ..... 16 Hours**

**Outcome:** *Install stone paving.*

1. Identify types of poured concrete.
2. Describe natural paving materials.
3. Describe modular paving materials.
4. Describe permeable paving materials.
5. Describe paving material maintenance.
6. Explain base preparation and installation.
7. Explain cutting techniques.

- 8. Demonstrate interpretation of compaction tests.
- 9. Demonstrate construction of stone paving projects.

**F. Timber Construction .....22 Hours**

**Outcome: Use timber construction techniques.**

- 1. Identify types of wood.
- 2. Identify alternative wood materials.
- 3. Describe landscape structures.
- 4. Describe deck construction.
- 5. Describe fence construction.
- 6. Demonstrate interpretation of project plan details.
- 7. Demonstrate construction of timber projects.
- 8. Perform material requirement calculations.

**SECTION FOUR: .....PHYSIOLOGY, BOREAL, MONTANE AND WETLAND PLANTS ..... 40 HOURS**

**A. Physiology..... 16 Hours**

**Outcome: Manage plant development.**

- 1. Describe photosynthesis and respiration.
- 2. Describe vascular transportation.
- 3. Describe protein synthesis.
- 4. Describe the process of reproduction.
- 5. Describe plant hormones.
- 6. Describe physiological responses to environmental changes.

**B. Boreal Forests..... 6 Hours**

**Outcome: Use plants from the boreal forest region.**

- 1. Describe boreal forest ecosystem characteristics.
- 2. Describe maintenance requirements of plant species in the boreal forest region.
- 3. Demonstrate use of boreal forest region plants.
- 4. Demonstrate use of related boreal forest region plants species.

**C. Montane..... 6 Hours**

**Outcome: Use plants from the montane region.**

- 1. Describe montane ecosystem characteristics.
- 2. Describe maintenance requirements of plant species in the montane region.
- 3. Demonstrate use of montane region plants.
- 4. Demonstrate use of related montane region plants species.



**D. Wetlands..... 12 Hours**

**Outcome: Use plants from wetlands.**

1. Describe wetland characteristics.
2. Describe maintenance requirements of plant species in wetlands.
3. Demonstrate use of wetlands plants.
4. Demonstrate use of wetlands plants related species.

**SECTION FIVE: .....LANDSCAPE PESTS..... 50 HOURS**

**A. Integrated Pest Management..... 8 Hours**

**Outcome: Practice integrated pest management.**

1. Describe the principles of integrated pest management.
2. Describe ecosystem management for pest mitigation.
3. Describe pest monitoring systems.
4. Describe population thresholds.
5. Explain use of biological controls.
6. Explain pest-specific strategies.
7. Explain site-specific strategies.
8. Explain evaluation treatment effectiveness.

**B. Weed Management ..... 12 Hours**

**Outcome: Manage weeds.**

1. Describe weed biology.
2. Describe classification of weeds according to government legislation.
3. Describe identification of weeds.
4. Describe management of weeds.
5. Describe methods to control weeds.

**C. Disease Management ..... 10 Hours**

**Outcome: Manage plant disease.**

1. Identify causes of plant disease.
2. Identify causes of plant damage.
3. Describe prevalent biotic diseases.
4. Describe prevalent abiotic diseases.
5. Describe types of plant damage.
6. Describe methods to control disease.
7. Describe methods to control damage.

**D. Insect and Animal Management..... 12 Hours**

**Outcome:      *Manage pests.***

1. Identify insect pests.
2. Identify animal pests.
3. Describe insect management.
4. Describe introduced insects.
5. Describe animal pest management.
6. Describe types of pest damage.
7. Describe role of beneficial insects.
8. Explain insect classification.
9. Explain insect life cycles.
10. Explain insect adaptation to changing environments.

**E. Pesticides ..... 8 Hours**

**Outcome:      *Apply pesticide legislation.***

1. Describe the role of governments in pesticide legislation.
2. Describe Pest Management Regulatory Agency's (PMRA) pesticide assessment process.
3. Describe pesticide application.
4. Describe environmental impacts of pesticides.
5. Describe Pesticide Applicator Certificate requirements.
6. Explain purpose of the Agricultural Pests Act.
7. Develop a pest control plan by interpreting product labels.

**SECTION SIX: ..... SOFTSCAPE INSTALLATION AND PRUNING ..... 24 HOURS**

**A. Woody Plant Installation ..... 8 Hours**

**Outcome:      *Install woody plants.***

1. Explain loading and unloading procedures.
2. Explain installation of woody plants.
3. Explain transplanting of woody plants.
4. Explain water requirements of newly installed plants.
5. Explain plant support methods.
6. Demonstrate interpretation of planting specifications and site layouts.

**B. Mulch Installation ..... 2 Hours**

**Outcome:      *Install mulch.***

1. Identify types of mulch.
2. Explain mulch selection.
3. Explain mulch installation.
4. Perform mulch quantity calculations.

C. Pruning Techniques.....14 Hours

**Outcome:**     *Prune plants.*

1. Identify pruning tools and equipment.
2. Explain pruning terminology.
3. Explain reasons for pruning.
4. Explain effects of pruning.
5. Demonstrate pruning techniques.

**THIRD PERIOD TECHNICAL TRAINING  
LANDSCAPE HORTICULTURIST TRADE  
COURSE OUTLINE**

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

**SECTION ONE:..... PROJECT MANAGEMENT ..... 20 HOURS**

**A. Customer Services ..... 4 Hours**

**Outcome:      *Provide customer service.***

1.      Describe professional conduct with customers.
2.      Describe metrics and measuring customer service results.
3.      Describe addressing customer needs and expectations.
4.      Describe conflict resolution.

**B. Job Planning ..... 10 Hours**

**Outcome:      *Plan projects.***

1.      Identify project requirements.
2.      Describe purpose of a client interview.
3.      Develop a site inventory.
4.      Develop a list of opportunities.
5.      Develop a list of constraints.
6.      Perform a client interview.

**C. Inventory Controls..... 6 Hours**

**Outcome:      *Manage inventory.***

1.      Describe systems for tracking inventory.
2.      Describe costing systems.
3.      Describe billing systems.
4.      Demonstrate use of work orders.

**SECTION TWO:..... LANDSCAPE CONSTRUCTION AND IRRIGATION..... 68 HOURS**

**A. Water Features..... 12 Hours**

**Outcome:      *Construct water features.***

1.      Describe functions of water features.
2.      Describe design considerations of water features.
3.      Describe the components of water features.
4.      Describe water feature maintenance.
5.      Describe repair of water features.

- 6. Explain codes and regulations for water features.
- 7. Demonstrate construction of water features.

**B. Landscape Lighting..... 8 Hours**

**Outcome: *Install landscape lighting.***

- 1. Describe functions of landscape lighting.
- 2. Describe types of landscape lighting.
- 3. Describe components of landscape lighting.
- 4. Describe landscape lighting maintenance.
- 5. Explain codes and regulations for landscape lighting.
- 6. Demonstrate installation of landscape lighting.

**C. Irrigation System Principles and Operation ..... 38 Hours**

**Outcome: *Install irrigation systems.***

- 1. Describe water sources.
- 2. Describe types of irrigation systems.
- 3. Describe irrigation components.
- 4. Describe site-specific water requirements.
- 5. Explain system hydraulics.
- 6. Explain codes and regulations for irrigation systems.
- 7. Explain irrigation plans.
- 8. Perform precipitation rate calculations.
- 9. Perform friction loss calculations.
- 10. Develop irrigation plans.
- 11. Demonstrate installation of irrigation systems.
- 12. Demonstrate operation of irrigation systems.

**D. Irrigation System Maintenance and Repair..... 10 Hours**

**Outcome: *Maintain irrigation systems.***

- 1. Describe irrigation water conservation practices.
- 2. Describe maintenance procedures.
- 3. Describe troubleshooting procedures.
- 4. Demonstrate auditing procedures.
- 5. Demonstrate troubleshooting irrigation systems.

**SECTION THREE: ..... SOFTSCAPE MAINTENANCE..... 24 HOURS**

**A. Softscape Repair ..... 4 Hours**

**Outcome: *Repair softscapes.***

- 1. Describe salt damage mitigation.
- 2. Describe decompaction techniques.

3. Demonstrate decompaction techniques.

**B. Interior Landscape Plant Installation ..... 8 Hours**

**Outcome:** *Install interior landscapes plants.*

1. Identify interior plants.
2. Describe media for interior plants.
3. Describe considerations for interior plant installation.
4. Describe interior plant installation.

**C. Interior Landscape Plant Maintenance..... 4 Hours**

**Outcome:** *Maintain interior landscape plants.*

1. Describe interior plant maintenance.
2. Describe interior plant fertilization.
3. Describe pest control for interior plants.
4. Describe environmental controls for interior plants.
5. Demonstrate assessment of interior landscapes.

**D. Snow and Ice Control ..... 4 Hours**

**Outcome:** *Practice snow and ice control.*

1. Identify equipment used for snow and ice control.
2. Describe products used for snow and ice control.
3. Describe procedures used to control snow and ice.
4. Describe use of weather prediction tools to implement snow and ice control.
5. Describe liability pertaining to snow and ice control.
6. Describe record keeping for snow and ice control.
7. Describe the impact of snow and ice control on the landscape.
8. Describe snow and ice control environmental stewardship.
9. Explain codes and regulations for snow and ice control.

**E. Landscape Structures Maintenance ..... 4 Hours**

**Outcome:** *Maintain landscape structures.*

1. Describe landscape structure maintenance.
2. Describe retaining wall maintenance.
3. Describe paver maintenance.
4. Describe natural stone maintenance.
5. Describe poured concrete maintenance.
6. Describe wood structure maintenance.

**SECTION FOUR: .....SUSTAINABLE HORTICULTURAL PRACTICES..... 40 HOURS**

**A. Environmental Practices..... 4 Hours**

**Outcome:**     ***Apply environmental practices.***

1.     Describe biodiverse ecosystems.
2.     Describe impacts of plants on wildlife.
3.     Describe natural mimicry.
4.     Describe wildlife corridors.

**B. Introduced Herbaceous Plants.....20 Hours**

**Outcome:**     ***Use introduced herbaceous plants.***

1.     Describe landscape uses of introduced herbaceous plants.
2.     Describe introduced herbaceous plants and family characteristics.
3.     Describe maintenance practices of introduced herbaceous plants.
4.     Demonstrate use of introduced herbaceous plants in landscape designs.

**C. Introduced Woody Plants ..... 16 Hours**

**Outcome:**     ***Use introduced woody plants.***

1.     Describe landscape uses for introduced woody plants.
2.     Describe introduced woody plants and family characteristics.
3.     Describe maintenance practices for introduced woody plants.
4.     Demonstrate use of introduced woody plants in landscape designs.

**SECTION FIVE: .....URBAN FORESTRY AND ARBORICULTURE ..... 58 HOURS**

**A. Tree Physiology ..... 6 Hours**

**Outcome:**     ***Assess tree physiology in the landscape.***

1.     Identify tree defects.
2.     Describe tree root structure.
3.     Describe site constraints that affect root development.
4.     Describe tree hormone cycles.
5.     Describe tree ecophysiology.
6.     Explain tree defence systems.
7.     Explain tree morphology.

**B. Tree Establishment and Independence.....22 Hours**

**Outcome:**     ***Apply techniques to achieve plant independence in the landscape.***

1.     Identify urban forestry information resources.
2.     Describe optimization of tree health in the urban environment.
3.     Describe assessment of site constraints that impact tree health.
4.     Explain components of urban forests.

5. Explain environmental benefits of urban forests.
6. Explain the impact of site constraints on tree development.
7. Explain the impact of nursery practices on tree installation.
8. Explain the impact of nursery practices on tree establishment.
9. Explain the impact of design on tree independence.
10. Explain maintenance programs to optimize tree growth.
11. Develop selection plans for urban trees.

**C. Tree Assessment ..... 6 Hours**

**Outcome: Assess trees.**

1. Describe methods of tree condition assessment.
2. Describe tree valuation.
3. Describe tree risk evaluation.
4. Describe the risk mitigation strategies.
5. Describe tree inventory systems.
6. Explain codes and regulations for the arboriculture industry.
7. Perform tree condition assessments.
8. Perform tree structure assessments.

**D. Tree Protection ..... 8 Hour**

**Outcome: Protect trees in the landscape.**

1. Explain tree protection.
2. Explain tree stress caused by site disturbances.
3. Explain excavation techniques that minimize tree damage.
4. Explain soil protection techniques.
5. Explain root protection systems.
6. Develop a tree protection plan.
7. Perform critical root zone assessments.
8. Perform tree protection zones calculations.

**E. Tree Pruning..... 8 Hours**

**Outcome: Prune trees.**

1. Describe tree-pruning techniques.
2. Describe pruning impact on wind load.
3. Describe pruning impact on tree structure.
4. Describe codominant stem management.
5. Describe a pruning plan based on tree life cycles.
6. Describe pruning prescription.
7. Describe natural bracing.
8. Develop pruning plans.



**F. Tree Removal.....8 Hours**

**Outcome: Remove trees.**

1. Describe tree removal procedures.
2. Describe tree removal risks.
3. Describe felling small trees.
4. Describe stump grinding.
5. Demonstrate chainsaw operation.

**SECTION SIX:..... GROWING FACILITIES..... 30 HOURS**

**A. Growing Facilities and Components .....20 Hours**

**Outcome: Construct a growing facility.**

1. Explain site preparation for growing facility construction.
2. Explain water management techniques.
3. Explain growing facility designs.
4. Explain growing facility structural components.
5. Explain growing facility structure orientation.
6. Explain growing facility environment components.
7. Explain codes and regulations for growing facilities.
8. Develop growing facility layout plans.

**B. Growing Facility Operation..... 4 Hours**

**Outcome: Operate a growing facility.**

1. Describe growing facility operation.
2. Describe operation of environmental climate monitoring devices.
3. Describe emergency backup systems.
4. Explain environmental control in growing facilities.
5. Explain irrigation system operation.
6. Explain types of fertilization.
7. Explain use of fertigation.

**C. Sanitary Environments .....6 Hours**

**Outcome: Create a sanitary environment.**

1. Describe maintenance of sanitary environments.
2. Describe use of inspections to maintain sanitation.
3. Describe cultural practices for preventing plant disease.
4. Describe facility sanitation practices.
5. Describe crop sanitation practices.
6. Describe tool sanitation practices.
7. Describe mitigation of disease within facilities.

8. Describe mitigation of pest transmission within facilities.
9. Describe mitigation of disease entering facilities.
10. Describe mitigation of pest transmission entering facilities.

**FOURTH PERIOD TECHNICAL TRAINING  
LANDSCAPE HORTICULTURIST TRADE  
COURSE OUTLINE**

*UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.*

**SECTION ONE:..... BUSINESS ADMINISTRATION ..... 14 HOURS**

**A. Post Construction Site Assessment.....4 Hours**

**Outcome:      *Conduct post construction site assessments.***

1.      Describe job closeout procedures.
2.      Describe a final site inspection.
3.      Describe Construction Completion Certificates (C.C.C.)
4.      Describe Final Acceptance Certificates (F.A.C.)
5.      Explain job completion documentation requirements.

**B. Scheduling ..... 4 Hours**

**Outcome:      *Schedule resources for a landscape project.***

1.      Identify principles of project management.
2.      Explain construction scheduling.
3.      Explain supply chain management constraints.
4.      Develop charts for a project schedule.

**C. Workplace Coaching Skills.....2 Hours**

**Outcome:      *Use coaching skills when training an apprentice.***

1.      Describe the process for coaching an apprentice.
2.      Describe mentoring skills for training in the work place.

**D. Alberta's Industry Network.....2 Hours**

**Outcome:      *Describe the role of the network of industry committees that represent trades and occupations in Alberta.***

1.      Describe Alberta's Apprenticeship and Industry Training system.
2.      Describe roles and responsibilities of the Alberta Apprenticeship and Industry Training Board, the Government of Alberta and post-secondary institutions.
3.      Describe roles and responsibilities of the Provincial Apprenticeship Committees (PACs), Local Apprenticeship Committees (LACs) and Occupational Committees (OCs).

**E. Interprovincial Standards Red Seal Program .....2 Hours**

**Outcome:      *Use Red Seal products to challenge an interprovincial examination.***

1.      Identify Red Seal products used to develop Interprovincial examinations.
2.      Use Red Seal products to prepare for an Interprovincial examination.

## SECTION TWO:.....CONTRACT MANAGEMENT ..... 42 HOURS

## A. Estimating ..... 20 Hours

**Outcome:** *Prepare estimates for landscape projects.*

1. Identify the requirements for a project cost estimate.
2. Identify overhead and administrative costs.
3. Describe labour cost components.
4. Describe equipment costing.
5. Describe labour costing.
6. Explain rationale for sub-contracting.
7. Perform production rate calculations.
8. Perform material cost estimates.
9. Perform labour cost estimates.
10. Perform project cost estimates.
11. Perform profit loss calculations.

## B. Contract Security Measures.....8 Hours

**Outcome:** *Implement contract security measures.*

1. Explain guarantees and warranties.
2. Explain bonds and security certificates.
3. Explain prepaid contracting licences.
4. Explain insurance requirements.
5. Explain builder's liens.
6. Explain maintenance obligations of warranty periods.
7. Explain practices to protect guarantors.

## C. Tendering and Contracts .....14 Hours

**Outcome:** *Prepare bids for landscape projects.*

1. Describe the tendering process.
2. Describe subcontract agreements.
3. Describe purchase orders.
4. Describe addenda and change orders.
5. Describe contract law.
6. Describe landscape related contracts.
7. Explain government regulations for tendering contracts.
8. Explain bonding procedures and requirements.
9. Explain purpose and application of deposits.
10. Explain holdback implications.
11. Explain cash flow implications.

- 12. Develop landscape contract documents.
- 13. Develop a bid for a landscape design project.

**SECTION THREE: .....LANDSCAPE DESIGN ..... 70 HOURS**

**A. Design Principles and Elements ..... 16 Hours**

**Outcome:** *Analyze landscape designs.*

- 1. Describe landscape design principles and elements.
- 2. Describe components of landscape styles.
- 3. Describe history of landscape styles.
- 4. Describe use of lighting in a landscape design.
- 5. Perform analyses of established landscape projects.

**B. Drafting ..... 10 Hours**

**Outcome:** *Use drafting to create a landscape design.*

- 1. Explain line weights and line types.
- 2. Explain lettering sizes and styles.
- 3. Explain scaling of drawings.
- 4. Explain landscape symbols.
- 5. Explain hand-rendering techniques.
- 6. Explain functions of landscape design software.
- 7. Demonstrate manual graphic skills.

**C. Design Process .....34 Hours**

**Outcome:** *Apply design processes to landscape projects.*

- 1. Describe the scope of landscape design.
- 2. Explain the function of a design contract.
- 3. Explain functional plans.
- 4. Explain concept plans.
- 5. Explain master plans.
- 6. Explain sustainable practices in design.
- 7. Perform a comparison of the fiduciary duties of consultant's vs contractors.
- 8. Develop landscape projects.

**D. Construction Plans ..... 10 Hours**

**Outcome:** *Develop construction plans.*

- 1. Describe construction plan requirements.
- 2. Perform interpretation of layout and grading plans.
- 3. Perform interpretation of planting plans.
- 4. Perform interpretation of construction details.

- 5. Perform interpretation of lighting plans.
- 6. Perform calculation of electrical requirements for low voltage lighting.

**SECTION FOUR: .....SUSTAINABLE LANDSCAPE TECHNOLOGIES ..... 28 HOURS**

**A. Environmental Ethics ..... 4 Hours**

**Outcome:** *Evaluate economics of sustainable landscape technologies.*

- 1. Describe economic impacts of sustainable landscape construction practices.
- 2. Describe longevity of materials.
- 3. Describe capital costs.
- 4. Describe maintenance costs.
- 5. Describe replacement costs.
- 6. Describe return on investment of sustainable landscape technologies.
- 7. Perform cost analysis of sustainable landscape projects.

**B. Green Roofs ..... 8 Hours**

**Outcome:** *Maintain green roofs.*

- 1. Describe types of green roofs.
- 2. Describe installation of green roofs.
- 3. Describe plants used on green roofs.
- 4. Describe growing media used on green roofs.
- 5. Describe hydrology of green roofs.
- 6. Describe maintenance of green roofs.
- 7. Explain codes and regulations for green roofs.
- 8. Explain fall protection for green roofs.

**C. Living Walls..... 4 Hours**

**Outcome:** *Maintain living walls.*

- 1. Describe types of living walls.
- 2. Describe installation of living walls.
- 3. Describe plants used in living walls.
- 4. Describe growing media used in living walls.
- 5. Describe hydrology of living walls.
- 6. Describe maintenance of living walls.
- 7. Explain codes and regulations for living walls.
- 8. Explain access to living walls.

**D. Rainwater Management ..... 8 Hours**

**Outcome:** *Manage rainwater.*

- 1. Describe types of rainwater management systems.
- 2. Describe plants used in rainwater management.

3. Describe media used in rainwater management.
4. Explain installation of rainwater management systems.
5. Explain maintenance of rainwater management systems.
6. Explain codes and regulations for rainwater management systems.

**E. Erosion Control .....4 Hours**

**Outcome: Control erosion.**

1. Identify signs of erosion.
2. Describe types of erosion control materials.
3. Describe maintenance of erosion control materials.
4. Explain codes and regulations for erosion control.
5. Perform interpretation of erosion control specifications.

**SECTION FIVE: ..... SPECIALTY CROPS..... 38 HOURS**

**A. Edible Fruit Species ..... 12 Hours**

**Outcome: Grow edible fruit species.**

1. Describe landscape uses for edible fruit species.
2. Describe maintenance practices for edible fruit species.
3. Describe edible fruit species characteristics.
4. Describe edible fruit species family characteristics.
5. Describe cross-pollination practices for fruit production.
6. Develop a landscape design using edible fruit species.
7. Perform assessment of edible fruit species prior to installation.

**B. Vines ..... 4 Hours**

**Outcome: Grow vines.**

1. Describe landscape uses for vines.
2. Describe maintenance practices for vines.
3. Describe vines characteristics.
4. Describe vines family characteristics.
5. Describe harvesting practices for vine crops.
6. Develop landscape designs using vines.

**C. Geophytes ..... 8 Hours**

**Outcome: Grow geophytes.**

1. Identify types of modified roots.
2. Describe features of modified roots.
3. Describe landscape uses for geophytes.
4. Describe seasonal maintenance practices.
5. Describe geophytes characteristics.

6. Describe geophytes family characteristics.
7. Describe storage practices for tender perennials.
8. Perform bulb propagation.
9. Perform bulb planting.

**D. Bedding Plants.....8 Hours**

**Outcome: *Grow bedding plants.***

1. Identify procedures for seasonal bedding plant installation.
2. Describe landscape uses of bedding plants.
3. Describe maintenance practices for bedding plants.
4. Describe bedding plants characteristics.
5. Describe family bedding plant characteristics.
6. Describe edible plants used in the landscape.
7. Develop landscape designs using bedding plants.

**E. Ornamental Grasses.....6 Hours**

**Outcome: *Grow ornamental grasses.***

1. Describe features and functions of warm season grasses.
2. Describe landscape uses for ornamental grasses.
3. Describe seasonal maintenance practices.
4. Describe ornamental grasses characteristics.
5. Describe ornamental grasses family characteristics.
6. Develop landscape designs using ornamental grasses.

**SECTION SIX:.....NURSERY PRODUCTION AND GREENHOUSE CROPS ..... 48 HOURS**

**A. Propagation .....16 Hours**

**Outcome: *Propagate crops.***

1. Describe tissue culture propagation methods.
2. Describe media use in container production.
3. Describe sanitation practices.
4. Describe methods of stock plant selection.
5. Describe nursery containers.
6. Explain sexual propagation methods.
7. Explain asexual propagation methods.
8. Explain regulations for propagation of proprietary plants.
9. Explain requirements for record keeping and labelling.
10. Explain the impact of production practices on establishment in the landscape.
11. Develop a crop production plan.
12. Demonstrate sexual propagation methods.



13. Demonstrate asexual propagation methods.
14. Perform seed harvesting.

**B. Transplanting ..... 6 Hours**

**Outcome: *Transplant crops.***

1. Identify physiological factors that affect transplanting.
2. Identify environmental factors that affect transplanting.
3. Demonstrate transplanting.

**C. Growing On ..... 8 Hours**

**Outcome: *Grow crops.***

1. Describe the maintenance of stock plants.
2. Describe growing on of field crops.
3. Describe growing on of container crops.
4. Describe growing on of greenhouse crops.
5. Describe water requirements for crop production.
6. Describe pest management techniques.
7. Describe disease management techniques.
8. Describe techniques used for hardening-off field and container crops.
9. Describe fertilizer application.

**D. Harvesting ..... 6 Hours**

**Outcome: *Harvest crops.***

1. Describe harvesting field crops.
2. Describe harvesting container crops.
3. Describe harvesting greenhouse crops.
4. Describe harvesting bare root plant material.
5. Describe harvesting sod crops.

**E. Winterizing ..... 6 Hours**

**Outcome: *Winterize crops.***

1. Identify crops that require winter protection.
2. Describe winterizing procedures.
3. Describe spring maintenance.

**F. Grading and Shipping ..... 6 Hours**

**Outcome: *Ship crops.***

1. Describe the maintenance of nursery stock prior to shipping.
2. Describe industry approved grading standards.
3. Describe phytosanitary regulations.
4. Describe procedures for storing plant material.

5. Describe procedures for grading crops.
6. Describe procedures for shipping crops.
7. Describe climate control during transportation.
8. Describe equipment used for loading and shipping nursery crops.
9. Demonstrate use of shipping documentation.



# **Apprenticeship and Industry Training**

Alberta Trades. World Ready.

**047**