



LANDSCAPE-HORTICULTURIST

CURRICULUM STANDARD



APPRENTICESHIP AND

OCCUPATIONAL CERTIFICATION

Department of Post-Secondary
Education, Training and Labour

Date: 01/2011

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TABLE OF CONTENTS

Acknowledgements.....	1
Preface.....	3
Introduction.....	4
Essential Skills	5
Block Breakdown	7

PROGRAM CONTENT

Block 1	9
Block 2	29
Block 3.....	55

PREFACE

This curriculum standard is intended to assist instructional staff in the design and delivery of technical, in-class training in support of the Landscape-Horticulturist program.

This curriculum standard contains all the technical training elements required to complete the Landscape-Horticulturist apprenticeship program and has been developed based on the 2010 National Occupational Analysis (NOA) and the 2010 Interprovincial Program Guide (IPG). Both the NOA and the IPG can be found on the Red Seal website (www.red-seal.ca).

Implementation of this curriculum standard for Apprenticeship training is outlined in the following table.

Block	Implementation Effective
Block 1	January 2011
Block 2	August 2012
Block 3	August 2013

*** The above implementation schedule was current at time of printing. Please **confirm** with Apprenticeship Program Development Staff prior to commencing training.*

As this curriculum standard will be amended periodically, comments or suggestions for improvement should be directed to:

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INTRODUCTION

This curriculum standard is divided into courses. The course codes are used as a means of identification and are not intended to convey the order of delivery. Each course consists of **Learning Outcomes, National Occupational Analysis References, Suggested Hours, Objectives and Content and Performance Outcomes**. A brief description of each of these sections follows.

Learning Outcomes describe the knowledge the apprentice will have learned upon completion of the course.

National Occupational Analysis References identifies the sub-tasks of the NOA which relates to the content of the course.

Suggested Hours provide an indication of the time it should take to cover the material in the course and are provided as a guide only.

Objectives and Content contains the information that is to be covered in order to gain the knowledge or skills outlined in the learning and performance outcomes for the course. The learning activities used for training are at the discretion of the institution. Some examples include lectures, text materials and exercises, instructor demonstrations, individual or group projects, etc.

Detailed content for each objective has not been developed. Where detail is required for clarity, content has been provided. The content listed within the curriculum standard is **not** intended to represent an inclusive list; rather, it is included to illustrate the intended direction for the objective.

Performance Outcomes describe the skills the apprentice will be able to perform upon completion of the course. The practical activities used to assist the apprentice in meeting the performance outcomes are at the discretion of the institution.

Safe work practices are inherent throughout this curriculum standard even though they are not specified. Safe work practices are implied and should be stressed throughout the training.

ESSENTIAL SKILLS

Human Resources and Skills Development Canada (HRSDC) defines Essential Skills as “The skills needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.”

HRSDC has developed Essential Skills profiles which describe how each of the nine Essential Skills are used by workers in an occupation.

These profiles include:

- A brief description of the occupation;
- A list of the most important Essential Skills;
- Examples of tasks that illustrate how each Essential Skill is applied;
- Complexity ratings that indicate the level of difficulty;
- The physical aspects of performing the job and the attitudes that workers feel are needed to do the job well;
- Future trends affecting Essential Skills.

The Essential Skills profiles can be found on the HRSDC website at http://www10.hrsdc.gc.ca/es/english/ES_Profiles.aspx

The development and improvement of these Essential Skills is inherent throughout the apprenticeship training program as apprentices work towards achieving journeyperson status.

BLOCK BREAKDOWN

Block 1 - 6 weeks			Block 2 -6 weeks		
Course Code	Title	Page	Course Code	Title	Page
LHT-100	Safety	10	LHT-200	Plant Identification II	30
LHT-105	Hand and Power Tools	12	LHT-205	Pest and Disease Management	33
LHT-110	Vehicles, Equipment and Machinery	14	LHT-210	Trade Related Documents	36
LHT-115	Plant Science	16	LHT-215	Plan Reading	38
LHT-120	Plant Identification I	18	LHT-220	Job Planning	40
LHT-125	Soil Management	21	LHT-225	Site Protection, Grading and Drainage	42
LHT-130	Fertilizers	23	LHT-230	Plant Inventory Management	44
LHT-135	Communication	25	LHT-235	Plant Installation	46
LHT-140	Site Layout and Surveying	27	LHT-240	Turf Establishment	49
			LHT-245	Landscape Pavers	51
			LHT-250	Sales and Customer Relations	53
Block 3 - 6 weeks					
Course Code	Title	Page			
LHT-300	Plant Identification III	56			
LHT-305	Plant Care and Maintenance	59			
LHT-310	Pruning	61			
LHT-315	Turf Maintenance	63			
LHT-320	Irrigation	65			
LHT-325	Landscape Walls	67			
LHT-330	Concrete Construction	69			
LHT-335	Wood Construction	71			
LHT-340	Water Features and Low Voltage Landscape Lighting	73			
LHT-345	Interior Plantscapes	75			
LHT-350	Estimating	78			

Block 1

Code	Title	Hours	Page
LHT-100	Safety	14	
LHT-105	Hand and Power Tools	7	
LHT-110	Vehicles, Equipment and Machinery	21	
LHT-115	Plant Science	35	
LHT-120	Plant Identification I	35	
LHT-125	Soil Management	28	
LHT-130	Fertilizers	18	
LHT-135	Communication	17	
LHT-140	Site Layout and Surveying	35	

LHT-100 Safety

Learning Outcomes:

- Demonstrate knowledge of safety equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulatory requirements pertaining to safety.

National Occupational Analysis Reference:

- 1.01 Maintains hand tools.
- 1.06 Uses personal protective equipment (PPE).
- 2.02 Uses documentation and reference material.
- 2.04 Complies with policies and regulations.
- 2.10 Maintains safe work environment.
- 5.03 Participates in job planning activities.
- 5.04 Prepares site.

Suggested Hours

14 hours

Objectives and Content:

1. Identify types of personal protective equipment (PPE) and clothing and describe their applications.
2. Describe the procedures for care and maintenance of PPE.
3. Identify hazards and describe safe work practices and equipment.
 - i) personal
 - ii) workplace
 - iii) environment

4. Identify and describe workplace safety and health regulations.
 - i) federal
 - Material Safety Data Sheets (MSDS)
 - Workplace Hazardous Material Information System (WHMIS)
 - Transportation of Dangerous Goods (TDG)
 - Pest Management Regulatory Agency (PMRA)
 - ii) provincial/territorial
 - occupational health and safety (OH&S)
 - iii) municipal

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select, use and maintain PPE.

LHT-105 Hand and Power Tools

Learning Outcomes:

- Demonstrate knowledge of hand, power and measuring tools and equipment, their applications, maintenance and procedures for use.

National Occupational Analysis Reference:

- 1.01 Maintains hand tools.
- 1.02 Maintains power tools.
- 1.03 Maintains measuring equipment.
- 1.05 Complies with policies and regulations.

Suggested Hours

7 hours

Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to tools and equipment.
2. Describe the implications of hand and power tool selection and use on the practice of environmental stewardship.
3. Identify types of hand tools and describe their applications and procedures for use.
4. Describe the procedures used to inspect, maintain, sharpen, clean and store hand tools.
5. Identify types of power equipment and describe their applications, limitations and procedures for use.
 - i) electric
 - ii) gas
 - two cycle engine
 - four cycle engine
6. Describe the daily/seasonal operating procedures used to inspect, maintain, sharpen, clean, and store power tools.

7. Identify types of measuring tools and equipment and describe their applications and procedures for use.
8. Describe the procedures used to inspect, clean, maintain and store measuring tools and equipment.
9. Use and maintain hand, power and measuring tools applicable to the workplace.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select, inspect, use and maintain hand tools.
2. Select, inspect and use power tools.
3. Perform daily and seasonal maintenance procedures on power tools.
4. Select, inspect, use and maintain measuring tools.

LHT-110 Vehicles, Equipment and Machinery

Learning Outcomes:

- Demonstrate knowledge of vehicles/trailers, equipment and machinery, and their applications, operation and procedures for use.

National Occupational Analysis Reference:

- 1.02 Maintains power tools.
- 1.03 Maintains measuring equipment.
- 1.04 Maintains vehicles and motorized equipment.
- 1.05 Maintains equipment attachments.
- 1.06 Transports equipment.

Suggested Hours

21 hours

Objectives and Content

1. Identify hazards and describe safe work practices pertaining to vehicles/trailers, equipment and machinery.
2. Describe the implications of vehicle, equipment and machinery selection and use on the practice of environmental stewardship.
3. Interpret codes and regulations pertaining to vehicles/trailers, equipment and machinery.
4. Identify types of engines and describe their characteristics, applications and operation.
 - i) gasoline/propane
 - ii) diesel
 - iii) electric
5. Identify basic vehicle systems and components and describe their characteristics and operation.
 - i) drive systems
 - ii) brakes
 - iii) control/safety systems

6. Describe the daily/seasonal operating procedures used to inspect, clean and maintain engines.
 - i) safety checks
 - ii) manufacturer's specifications/operators equipment manual
7. Identify types of equipment and machinery and describe their characteristics, applications and operation.
 - i) components
 - ii) attachments
8. Describe the daily/seasonal operating procedures used to inspect, maintain, clean and store equipment and machinery.
9. Describe the procedures used to load/unload, secure and transport tools, equipment and machinery.
10. Describe the daily/seasonal operating procedures used to inspect, maintain, clean and store vehicles/trailers.
11. Describe the operating procedures when hauling a trailer.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select and use vehicles, equipment and machinery.
2. Perform daily and seasonal inspection and maintenance procedures on vehicles, equipment and machinery.

LHT-115 Plant Science

Learning Outcomes:

- Demonstrate knowledge of plant growth and development.
- Demonstrate knowledge of plant nutrient requirements.

National Occupational Analysis Reference:

- 8.01 Maintains growing media.
- 8.03 Maintains interior softscape.
- 8.04 Maintains exterior softscape.

Suggested Hours

35 hours

Objectives and Content:

1. Define terminology associated with plant science.
2. Identify the factors which impact on plant growth and development.
 - i) temperature
 - ii) hardiness
 - iii) growing medium
 - iv) air quality
 - carbon dioxide
 - oxygen
 - humidity
 - v) light
 - vi) water
 - vii) pests and disease
 - viii) environmental stresses
 - ix) plant life cycle

3. Identify plant anatomy and morphology.
 - i) cell types
 - ii) tissues
 - iii) organs
 - leaves
 - stems
 - roots
 - flowers
 - fruits
 - seeds

4. Explain the function of a plant as an organism.
 - i) reproduction
 - ii) photosynthesis
 - iii) respiration
 - iv) transpiration
 - v) hormones
 - vi) dormancy

5. Identify plant nutrients and describe the impact of nutrient deficiencies/excess on plants and plant growth.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

N/A

LHT-120 Plant Identification I

Learning Outcomes:

- Demonstrate knowledge of the International Code of Botanical Nomenclature used for plant identification.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 4.01 Identifies plants and plant requirements.
- 4.02 Manages growing conditions.
- 6.03 Installs interior landscape plants.
- 6.04 Installs exterior landscape plants.
- 8.03 Maintains interior landscape plants.
- 8.04 Maintains exterior landscape plants.

Suggested Hours

35 hours

Objectives and Content:

1. Explain the International Code of Botanical Nomenclature and its use in plant identification.
 - i) family
 - ii) genus
 - iii) species
 - iv) variety/cultivar
 - v) common name
 - vi) nursery trademarks
2. Interpret the use of dichotomous keys to classify plants.
3. Identify plant categories and describe their characteristics.
 - i) herbaceous
 - ii) woody
 - iii) annual
 - iv) perennial
 - v) biennial

4. Use plant morphology to categorize a plant to the family level.
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

5. Use plant morphology to categorize the plants on the list to the genus and species level (see chart below).
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

6. Describe the cultural requirements of these plants.
 - i) moisture
 - ii) light
 - iii) soil type
 - iv) hardiness
 - v) nutrients
 - vi) propagation
 - vii) salt tolerance

7. Identify the considerations for the selection of these plants for specific uses.
 - i) residential applications
 - ii) commercial applications
 - iii) reclamation/restoration
 - iv) location and environment

8. Select plants for specific applications.

Landscape Horticulturist Plant List by Family

	Family	Latin name	Common name	Character
1	ASTERACEAE	<i>Gerbera jamesonii</i>	Transvaal Daisy	Annual
2	ASTERACEAE	<i>Aster spp.</i>	Common Aster	Perennial
3	ASTERACEAE	<i>Leucanthemum x superbum</i>	Shasta Daisy	Perennial
4	ASTERACEAE	<i>Rudbeckia fulgida</i>	Black Eyed Susan	Perennial
5	BERBERIDACEAE	<i>Berberis thunbergii</i>	Japanese Barberry	Tree/Shrub
6	BETULACEAE	<i>Betula papyrifera</i>	Paper Birch	Tree/Shrub
7	BRASSICACEAE	<i>Lobularia maritima</i>	Alyssum	Annual
8	BRASSICACEAE	<i>Iberis sempervirens</i>	Candytuft	Perennial
9	CAPRIFOLIACEAE	<i>Lonicera x brownii</i> 'Dropmore Scarlet'	Scarlet Trumpet Honeysuckle	Tree/Shrub
10	CAPRIFOLIACEAE	<i>Symphoricarpos albus</i>	Snowberry	Tree/Shrub
11	CARYOPHYLLACEAE	<i>Dianthus chinensis</i>	Dianthus/China Pink	Annual
12	CELASTRACEAE	<i>Euonymus alatus</i>	Winged Burning Bush	Tree/Shrub
13	CRASSULACEAE	<i>Sedum spectabile</i>	Stonecrop	Perennial
14	CUPRESSACEAE	<i>Juniperus horizontalis</i>	Horizontal Juniper	Tree/Shrub
15	CUPRESSACEAE	<i>Thuja occidentalis</i>	Eastern White Cedar	Tree/Shrub
16	DRYOPTERIDACEAE	<i>Matteuccia struthiopteris</i>	Ostrich Fern	Perennial
17	ERICACEAE	<i>Arctostaphylos uva-ursi</i>	Bearberry/Kinnikinnick	Tree/Shrub
18	FUMARIACEAE	<i>Dicentra spectabilis</i>	Bleeding Heart	Perennial
19	GERANIACEAE	<i>Pelargonium spp.</i>	Geranium	Annual
20	LAMIACEAE	<i>Salvia splendens</i>	Scarlet Sage	Annual
21	LAMIACEAE	<i>Monarda didyma</i>	Bee Balm	Perennial
22	LILIACEAE	<i>Hemerocallis spp.</i>	Daylily	Perennial
23	LILIACEAE	<i>Hosta spp.</i>	Hosta	Perennial
24	OLEACEAE	<i>Syringa vulgaris</i>	Common Lilac	Tree/Shrub
25	PINACEAE	<i>Picea glauca</i>	White Spruce	Tree/Shrub
26	PINACEAE	<i>Pinus mugo</i>	Mugo Pine, Swiss Mountain Pine	Tree/Shrub
27	POACEAE	<i>Miscanthus sinensis</i>	Maiden Grass	Perennial
28	POACEAE	<i>Calamagrostis x acutiflora</i>	Feather Reed Grass	Perennial
29	RANUNCULACEAE	<i>Delphinium elatum</i>	Perennial Larkspur	Perennial
30	RANUNCULACEAE	<i>Trollius europaeus</i>	Globeflower	Perennial
31	ROSACEAE	<i>Amelanchier alnifolia</i>	Service Berry	Tree/Shrub
32	ROSACEAE	<i>Rosa rugosa</i>	Rugosa Rose	Tree/Shrub
33	ROSACEAE	<i>Sorbus aucuparia</i>	European Mountain Ash	Tree/Shrub
34	ROSACEAE	<i>Spiraea japonica</i>	Japanese Spirea	Tree/Shrub
35	SALICACEAE	<i>Populus tremuloides</i>	Trembling Aspen	Tree/Shrub
36	SAPINDACEAE	<i>Acer ginnala</i>	Amur Maple	Tree/Shrub
37	SAPINDACEAE	<i>Acer saccharinum</i>	Silver Maple	Tree/Shrub
38	TAXACEAE	<i>Taxus x media</i>	Yew	Tree/Shrub
39	TILIACEAE	<i>Tilia cordata</i>	Little Leaf Linden	Tree/Shrub
40	VITACEAE	<i>Parthenocissus quinquefolia</i>	Virginia Creeper	Tree/Shrub

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select plants for specific applications.

LHT-125 Soil Management

Learning Outcomes:

- Demonstrate knowledge of soil types and soil amendments.

National Occupational Analysis Reference:

- 6.02 Installs growing media.
- 8.01 Maintains growing media.

Suggested Hours

28 hours

Objectives and Content:

1. Identify physical soil characteristics that must be considered when determining the suitability for plant growth.
 - i) soil formation
 - ii) drainage
 - iii) aeration/porosity
 - iv) water retention
 - v) compaction
 - vi) soil texture/structure
2. Describe the implications of soil management on the practice of environmental stewardship.
3. Identify types of media and describe their characteristics and applications.
 - i) native soil
 - ii) soilless medium
 - iii) manufactured soil
 - iv) compost

4. Identify the soil characteristics that impact soil chemical and biological properties.
 - i) nutrient availability
 - ii) chemical composition
 - soil acidity/alkalinity
 - soil salinity
 - cation exchange capacity
 - iii) organic matter
 - iv) biological activity
5. Explain the procedures used for taking soil samples.
6. Identify types of soil tests and describe their characteristics and applications.
7. Identify types of soil amendments and describe their characteristics and applications.
 - i) organic
 - ii) inorganic
8. Identify the considerations when selecting soil amendments for plants.
9. Describe the procedures used to apply and/or incorporate soil amendments.
10. Describe the procedures used to store, transport and dispose of soil and soil amendment products and packaging.
11. Select and incorporate soil amendments.
12. Interpret soil test results.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Sample soil for testing.
2. Interpret soil test results.
3. Select and incorporate soil amendments.

LHT-130 Fertilizers

Learning Outcomes:

- Demonstrate knowledge of the codes and regulations pertaining to fertilizers.
- Demonstrate knowledge of the characteristics of fertilizers.
- Demonstrate knowledge of the procedures and equipment used for the application, handling, transport, storage and disposal of fertilizers.

National Occupational Analysis Reference:

- 6.02 Installs growing media.
- 8.01 Maintains growing media.

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with fertilizers.
2. Identify hazards and describe safe work practices pertaining to fertilizers and their use.
3. Describe the implications of fertilizer management on the practice of environmental stewardship.
4. Identify types of fertilizers and describe their characteristics and applications.
5. Interpret codes and regulations pertaining to fertilizers.
6. Describe the analysis and formulation of fertilizers.
7. Describe the procedures and equipment used for the application of fertilizers.
8. Describe the procedures and equipment used to store, dispose and transport fertilizers.

9. Calibrate application equipment.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select and apply fertilizers.

LHT-135 Communication

Learning Outcomes:

- Demonstrate knowledge of effective communication practices.
- Demonstrate knowledge of communication equipment and their applications.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 2.03 Maintains records.
- 3.03 Maintains customer relations.

Suggested Hours

17 hours

Objectives and Content:

1. Identify effective communication practices.
2. Describe the importance of the coaching and mentoring relationship between journeyperson and apprentice.
3. Identify the types of communication methods and equipment and describe their applications.
4. Describe the importance of effective verbal, non-verbal and written communication with clients, contractors, suppliers and employees.
5. Communicate effectively using verbal and non-verbal techniques.
6. Prepare and deliver an informal presentation related to an industrial topic.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Communicate effectively using verbal and non-verbal techniques.

LHT-140 Site Layout and Surveying

Learning Outcomes:

- Demonstrate knowledge of the procedures used to perform site layout and surveying.

National Occupational Analysis Reference:

- 2.01 Performs site assessment.
- 5.01 Participates in basic landscape design activities.
- 5.02 Interprets landscape plans.
- 5.03 Participates in job planning activities.
- 5.04 Prepares site.

Suggested Hours

35 hours

Objectives and Content:

1. Define terminology associated with site layout and surveying.
2. Identify hazards and describe safe work practices pertaining to site layout and surveying.
3. Describe the implications of site layout and surveying on the practice of environmental stewardship.
4. Interpret documentation pertaining to site layout and surveying.
 - i) plans
 - ii) specifications
5. Identify specific tools and equipment relating to site layout and surveying, and describe their applications and procedures for use.
6. Identify the methods and procedures used to stake out points when performing site layout.
 - i) grade levels and stake interpretation
 - ii) grid system
 - iii) triangulation

- iv) distance and vector
- 7. Perform site layout.
- 8. Demonstrate the set up and use of surveying equipment.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

- 1. Set-up and use surveying equipment.
- 2. Perform site layout.

Block 2

Code	Title	Hours	Page
LHT-200	Plant Identification II	32	
LHT-205	Pest and Disease Management	35	
LHT-210	Trade Related Documents	10	
LHT-215	Plan Reading	7	
LHT-220	Job Planning	10	
LHT-225	Site Protection, Grading and Drainage	30	
LHT-230	Plant Inventory Management	10	
LHT-235	Plant Installation	15	
LHT-240	Turf Establishment	30	
LHT-245	Landscape Pavers	25	
LHT-250	Sales and Customer Relations	6	

LHT-200 Plant Identification II

Learning Outcomes:

- Demonstrate knowledge of additional plants, their characteristics and cultural requirements.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 4.01 Identifies plants and plant requirements.
- 4.02 Manages growing conditions.
- 6.03 Installs interior landscape plants.
- 6.04 Installs exterior landscape plants.
- 8.03 Maintains interior landscape plants.
- 8.04 Maintains exterior landscape plants.

Suggested Hours

32 hours

Objectives and Content:

1. Use plant morphology to categorize a plant to the family level.
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

2. Use plant morphology to categorize the plants on the list to the genus and species level (see chart below).
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

3. Describe the cultural requirements of these additional plants.
 - i) moisture
 - ii) light

- iii) soil type
 - iv) hardiness
 - v) nutrients
 - vi) propagation
 - vii) salt tolerance
4. Identify the considerations for the selection of these additional plants for specific uses.
- i) residential applications
 - ii) commercial applications
 - iii) reclamation/restoration
 - iv) location and environment
5. Select plants for specific applications.

Landscape Horticulturist Plant List by Family

	Family	Latin name	Common name	Character
1	AMARYLLIDACEAE	<i>Narcissus spp.</i>	Daffodil	Perennial
2	ANACARDIACEAE	<i>Rhus typhina</i>	Staghorn Sumac	Tree/Shrub
3	APOCYNACEAE	<i>Vinca minor</i>	Periwinkle	Perennial
4	BALSAMINACEAE	<i>Impatiens walleriana</i>	Impatiens	Annual
5	BORAGINACEAE	<i>Brunnera macrophylla</i>	Siberian Bugloss	Perennial
6	BORAGINACEAE	<i>Pulmonaria saccharata</i>	Lungwort	Perennial
7	CAMPANULACEAE	<i>Campanula carpatica</i>	Canterbury Bells	Perennial
8	CORNACEAE	<i>Cornus canadensis</i>	Bunchberry	Tree/Shrub
9	CORNACEAE	<i>Cornus sericea</i>	Red Osier Dogwood	Tree/Shrub
10	EUPHORBIACEAE	<i>Euphorbia polychroma</i>	Golden Spurge	Perennial
11	FABACEAE	<i>Lupinus polyphyllus</i>	Lupines	Annual
12	HYDRANGEACEAE	<i>Hydrangea paniculata</i>	Hydrangea	Tree/Shrub
13	IRIDACEAE	<i>Crocus spp.</i>	Crocus	Perennial
14	IRIDACEAE	<i>Iris sibirica</i>	Siberian Iris	Perennial
15	LAMIACEAE	<i>Ajuga reptans</i>	Carpet Bugleweed	Perennial
16	LILIACEAE	<i>Tulipa spp.</i>	Tulip	Perennial
17	LILIACEAE	<i>Muscari spp.</i>	Grape Hyacinth	Perennial
18	LOBELIACEAE	<i>Lobelia erinus</i>	Lobelia	Annual
19	PAEONIACEAE	<i>Paeonia lactiflora</i>	Common Garden Peony	Perennial
20	PAPAVERACEAE	<i>Papaver nudicaule</i>	Icelandic Poppy	Perennial
21	POACEAE	<i>Festuca ovina var. glauca</i>	Blue Sheep's Fescue	Perennial
22	POACEAE	<i>Helictotrichon sempervirens</i>	Blue Oat Grass	Perennial
23	POLEMONIACEAE	<i>Phlox subulata</i>	Creeping Phlox	Perennial
24	PRIMULACEAE	<i>Primula spp.</i>	Primrose	Perennial
25	ROSACEAE	<i>Potentilla fruticosa</i>	Potentilla	Tree/Shrub
26	SAXIFRAGACEAE	<i>Heuchera sanguinea</i>	Coral Bells	Perennial
27	SOLANACEAE	<i>Petunia x hybrida</i>	Petunia	Annual
28	VERBENACEAE	<i>Verbena x hybrida</i>	Verbena	Annual
29	VERBENACEAE	<i>Lantana camara</i>	Lantana	Annual
30	VIOLACEAE	<i>Viola x wittrockiana</i>	Pansy	Annual

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select plants for specific applications.

LHT-205 Pest and Disease Management

Learning Outcomes:

- Demonstrate knowledge of codes and regulations pertaining to pest and disease management.
- Demonstrate knowledge of types of pests and diseases and the procedures used to manage them.
- Demonstrate knowledge of the procedures used to handle, transport, apply, store and dispose of pest and disease management products and tools.
- Demonstrate knowledge of pest control products, formulations and application equipment.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 4.03 Manages pests and diseases.

Suggested Hours

35 hours

Objectives and Content:

1. Define terminology associated with pest and disease management.
2. Define the components of an Integrated Pest Management (IPM) program.
3. Describe the implications of IPM on the practice of environmental stewardship.
4. Identify methods used for pest and disease management and treatment.
 - i) regulatory
 - ii) physical/mechanical
 - iii) cultural
 - iv) biological
 - v) chemical
5. Identify hazards and describe safe work practices pertaining to pest and disease management.

6. Interpret and complete documentation pertaining to pest and disease management.
 - i) pest and disease monitoring
 - ii) treatment and management records
 - iii) evaluation of pest and disease management methods
7. Interpret codes and regulations pertaining to pest and disease management methods and products.
 - i) environmental protection
 - ii) personal protective equipment (PPE)
8. Identify the considerations for selecting and applying pest and disease management measures.
 - i) pest/disease populations
 - ii) injury levels
 - iii) action thresholds
 - iv) beneficial insect pest populations
9. Identify specific tools and equipment relating to pest and disease management and describe their applications and procedures for use.
10. Identify common types of pests in relation to the landscape and describe their characteristics and life cycles.
 - i) arthropods
 - ii) nematodes
 - iii) birds and mammals
 - iv) weeds
11. Identify common types of diseases and disorders in relation to the landscape and describe their characteristics.
 - i) biotic
 - ii) abiotic
12. Identify the factors for selecting and applying pest and disease management measures.
 - i) site analysis
 - ii) pest/disease populations
 - iii) injury levels
 - iv) action thresholds
 - v) monitoring techniques
13. Describe the procedures used to implement pest and disease management measures.
 - i) management techniques
 - ii) preparation
 - iii) equipment selection

- iv) equipment calibration
 - v) application techniques
14. Describe the procedures associated with the handling, transportation, storage and disposal of pest and disease management related products and materials.
- i) pest and disease management products
 - ii) infested or contaminated plant material or soil
 - iii) pest management product containers
15. Select, apply and record pest and disease management measures.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Complete documentation related to pest and disease management.
2. Select and apply non-chemical pest and disease management measures.

LHT-210 Trade Related Documents

Learning Outcomes:

- Demonstrate knowledge of trade related documents and their use.
- Demonstrate knowledge of the procedures used to prepare documentation.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 2.03 Maintains records.
- 2.04 Complies with policies and regulations.

Suggested Hours

10 hours

Objectives and Content:

1. Identify types of trade related documents and describe their applications.
 - i) manufacturers' specifications
 - ii) blueprints
 - iii) guidelines, codes and standards
 - hardscape specifications
 - softscape specifications
 - safety specifications
 - iv) contracts and proposals
 - tenders/tendering
 - guarantees/warranties

2. Identify types of documentation and describe the procedures used to prepare them.
 - i) work orders
 - change
 - job
 - material
 - ii) reports
 - hazard assessment
 - safety
 - workers compensation

- iii) maintenance/service/stock/inventory records
 - shop
 - job site
 - vehicle
 - equipment

3. Prepare and complete trade related forms and documents.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare and complete trade related forms and documents.

LHT-215 Plan Reading

Learning Outcomes:

- Demonstrate knowledge of landscape plans and associated documentation.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 5.01 Participates in job planning activities.
- 5.02 Interprets landscape plans.
- 5.04 Prepares site.

Suggested Hours

7 hours

Objectives and Content:

1. Identify types of landscape plans and documentation and describe their characteristics and applications.

2. Interpret information and design principles on landscape plans.
 - i) title block
 - ii) legend
 - iii) scale
 - iv) symbols
 - v) elements
 - vi) hazards
 - vii) details
 - viii) plant material
 - colour
 - texture
 - scale
 - form

3. Interpret information on specifications.
 - i) general conditions
 - ii) supplementary conditions
 - iii) contract personnel

4. Interpret and extract information from landscape plans and documentation.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Interpret landscape plans and specifications.

LHT-220 Job Planning

Learning Outcomes:

- Demonstrate knowledge of trade related documentation.
- Demonstrate knowledge of the procedures used to plan job tasks.

National Occupational Analysis Reference:

- 5.02 Interprets landscape plans.
- 5.03 Participates in job planning activities.
- 5.04 Prepares site.

Suggested Hours

10 hours

Objectives and Content:

1. Define terminology associated with job planning.
2. Identify hazards and describe safe work practices pertaining to job planning.
3. Identify types of trade related documentation and describe their applications and procedures for use.
 - i) drawings
 - ii) qualifications
 - iii) specifications
 - iv) codes and standards
 - v) manuals
 - vi) permits
 - vii) regulations
 - viii) policies
4. Identify the considerations and requirements when planning jobs and job tasks.
 - i) site assessment
 - ii) materials and equipment
 - iii) personnel
 - iv) sequence of work

- v) on-site staging
 - vi) clean-up/debris removal
5. Explain the importance of accurate record keeping and describe the associated procedures.
 6. Plan job tasks.
 7. Maintain accurate records.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Plan jobs and job tasks.

LHT-225 Site Protection, Grading and Drainage

Learning Outcomes:

- Demonstrate knowledge of the procedures used to protect features on the site.
- Demonstrate knowledge of the procedures used to perform grading and install drainage systems.
- Demonstrate knowledge of the installation of erosion control materials.

National Occupational Analysis Reference:

- 2.01 Performs site assessments.
- 5.04 Prepares site.
- 6.01 Installs erosion control materials.
- 7.01 Installs drainage systems.
- 9.01 Maintains drainage systems.

Suggested Hours

30 hours

Objectives and Content:

1. Define terminology associated with site protection, grading and drainage systems.
2. Identify hazards and describe safe work practices pertaining to site layout, surveying, grading and drainage.
3. Describe the implications of site protection, grading and drainage on the practice of environmental stewardship.
4. Interpret codes and regulations pertaining to site protection, grading and drainage.
5. Interpret documentation pertaining to site protection, grading and drainage.
 - i) grading plans
 - existing grades
 - proposed grades

- rough grades
 - finished grades
 - ii) drainage plans
 - iii) specifications
6. Identify specific tools, equipment and attachments relating to site protection, grading and drainage, and describe their applications and procedures for use.
 7. Identify the methods used to establish protection zones.
 8. Identify types of grading and drainage systems.
 9. Describe the procedures used to perform site grading.
 - i) rough grading
 - ii) grading for drainage
 - iii) finish grading
 10. Identify erosion and sediment control materials and describe their characteristics and applications.
 11. Describe the procedures used to install erosion and sediment control materials.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Perform site grading.
2. Install erosion and sediment control materials.

LHT-230 Plant Inventory Management

Learning Outcomes:

- Demonstrate knowledge of the procedures for ordering, receiving, storing and transporting of plant materials.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 2.03 Maintains records.
- 2.07 Orders plants and materials.
- 2.08 Transports materials.
- 2.09 Organizes plants, materials and equipment.
- 3.01 Controls inventory.

Suggested Hours

10 hours

Objectives and Content:

1. Define terminology associated with ordering, receiving, storing and transporting plant materials.
2. Identify hazards and describe safe work practices pertaining to handling plant materials.
3. Interpret documentation relevant to ordering, receiving, storing and transporting plant materials.
 - i) plans
 - ii) specifications
 - iii) regulations
 - iv) shipping documentation
4. Describe the procedures for ordering plant materials.
5. Explain the process for verifying and accepting plant material shipments.
 - i) required documentation
 - ii) verification of order
 - quantity

- variety
 - size
 - iii) quality
6. Describe the procedures used for transporting and storing plant materials.
- i) transportation methods
 - ii) loading
 - iii) securing
 - iv) protecting
 - v) unloading
 - vi) holding area

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Verify plant material shipments.
2. Transport and store plant materials.

LHT-235 Plant Installation

Learning Outcomes:

- Demonstrate knowledge of the procedures used to install herbaceous and woody plant materials.

National Occupational Analysis Reference:

- 6.02 Installs growing media.
- 6.03 Installs interior landscape plants.
- 6.04 Installs exterior landscape plants.
- 6.07 Installs mulch.

Suggested Hours

15 hours

Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to the installation of woody plants.
2. Describe the implications of plant installation on the practice of environmental stewardship.
3. Identify specific tools and equipment relating to plant material installation and describe their applications and procedures for use.
4. Identify the considerations for determining suitability of planting site for plant materials.
 - i) sun and wind exposure
 - ii) water availability
 - iii) quality of growing medium
 - iv) site accessibility
 - v) proximity to buildings and utility services
 - vi) air quality and pollutants
5. Describe the installation procedures for a variety of root preparations and stock types.
 - i) bare root

- ii) ball and burlap/wire basket
 - iii) containerized
 - iv) caliper stock
6. Describe the procedures used to prepare planting site for tree installation.
- i) excavation
 - ii) planting pit dimensions
 - iii) soil amendment
 - iv) site drainage
7. Describe the procedures used to install trees.
- i) placement
 - ii) loosening of root containment
 - iii) root placement
 - iv) backfilling
 - v) mulching
 - vi) machine-planting
 - vii) stabilizing
 - viii) fertilizing
8. Describe the procedures used for post-planting care of trees.
- i) irrigation
 - ii) pruning
 - iii) fertilizing
 - iv) protecting
 - v) stabilizing
 - vi) mulching
9. Describe the procedures used to prepare planting beds for herbaceous and woody plant material installation.
- i) bed cultivation
 - ii) incorporating soil amendment
 - iii) removal of weeds/debris
 - iv) bed edging
 - v) grading and drainage
10. Describe the procedures used to install herbaceous and woody plant materials.
- i) bed layout
 - ii) plant placement
 - iii) loosening of root containment
 - iv) root placement
 - v) backfilling
 - vi) irrigation
 - vii) fertilizing

viii) mulching

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare planting site and install trees.
2. Prepare planting site and install herbaceous and woody plants.

LHT-240 Turf Establishment

Learning Outcomes:

- Demonstrate knowledge of turf establishment methods and their associated procedures.

National Occupational Analysis Reference:

6.02	Installs growing media
6.05	Installs turf from seed.
6.06	Installs sod.

Suggested Hours

30 hours

Objectives and Content:

1. Define terminology associated with turf establishment.
2. Describe the implications of turf establishment on the practice of environmental stewardship.
3. Identify the grass species that are sustainable in various jurisdictions.
4. Identify the considerations when selecting turf grass types.
 - i) environmental conditions
 - ii) site use
 - iii) site size
 - iv) cultural requirements
5. Interpret and complete documentation relating to turf establishment.
6. Identify specific tools and equipment relating to turf establishment and describe their applications and procedures for use.
7. Identify the methods of turf establishment and describe their applications.
 - i) seeding
 - ii) sodding
8. Describe the procedures used to establish turf by seeding.

9. Describe the procedures used to establish turf by sodding.
10. Identify the methods used for post-establishment care of seeded and sodded turf and describe their applications.
11. Identify possible turf establishment problems and describe solutions.
12. Describe the procedures used for harvesting and post-harvest handling of sod.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Establish turf by seeding.
2. Establish turf by sodding.

LHT-245 Landscape Pavers

Learning Outcomes:

- Demonstrate knowledge of the procedures used to install natural stone paver and modular precast concrete landscape pavers and slabs.
- Demonstrate knowledge of the procedures used to maintain natural stone paver and modular precast concrete landscape pavers and slabs.

National Occupational Analysis Reference:

- 7.03 Installs walkway, patio, driveway and parking lot materials.
- 9.02 Maintains walkways, patios, driveways and parking lots.

Suggested Hours

25 hours

Objectives and Content:

1. Define terminology associated with hardscape installation and maintenance.
2. Identify hazards and describe safe work practices pertaining to hardscape installation and maintenance.
3. Describe the implications of landscape pavers on the practice of environmental stewardship.
4. Interpret codes, regulations and manufacturer's specifications pertaining to hardscape installation and maintenance.
5. Interpret documentation pertaining to hardscape installation and maintenance.
 - i) plans
 - ii) contract specifications
 - iii) shipping documents
6. Identify specific tools and equipment relating to hardscape installation and maintenance and describe their applications and procedures for use.

7. Identify types of natural stone paver, and modular precast concrete landscape pavers and slabs used in hardscape installation and describe their characteristics and applications.
8. Describe the procedures used to prepare for installation of natural stone paver, and modular precast concrete landscape pavers and slabs.
9. Describe the procedures used to install natural stone paver, and modular precast concrete landscape pavers and slabs.
10. Describe the procedures used to maintain natural stone paver and modular precast concrete landscape pavers and slabs.
11. Install landscape pavers.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare site and install landscape pavers.
2. Maintain landscape pavers.

LHT-250 Sales and Customer Relations

Learning Outcomes:

- Demonstrate knowledge of customer relations.
- Demonstrate knowledge of sales techniques.
- Demonstrate knowledge of products and services.

National Occupational Analysis Reference:

- 2.06 Communicates with others.
- 3.02 Sells products and services.
- 3.03 Maintains customer relations.

Suggested Hours

6 hours

Objectives and Content:

1. Explain the importance of advising clients about products and services.
2. Describe the procedures and techniques associated with the sales of products and services.
 - i) customer education
 - ii) up-selling products and services
 - iii) conflict resolution
 - iv) after service follow-up
3. Describe the procedures associated with retail sales.
 - i) merchandizing
 - ii) invoicing
 - iii) receiving payments
 - iv) advertising
4. Practice effective communication with clients.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Communicate effectively with clients.

Block 3

Code	Title	Hours	Page
LHT-300	Plant Identification III	30	
LHT-305	Plant Care and Maintenance	10	
LHT-310	Pruning	18	
LHT-315	Turf Maintenance	16	
LHT-320	Irrigation	22	
LHT-325	Landscape Walls	18	
LHT-330	Concrete Construction	18	
LHT-335	Wood Construction	18	
LHT-340	Water Features and Low Voltage Landscape Lighting	18	
LHT-345	Interior Plantscapes	14	
LHT-350	Estimating	28	

LHT-300 Plant Identification III

Learning Outcomes:

- Demonstrate knowledge of additional plants, their characteristics and cultural requirements.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 4.01 Identifies plants and plant requirements.
- 4.02 Manages growing conditions.
- 6.03 Installs interior landscape plants.
- 6.04 Installs exterior landscape plants.
- 8.03 Maintains interior landscape plants.
- 8.04 Maintains exterior landscape plants.

Suggested Hours

30 hours

Objectives and Content:

1. Use plant morphology to categorize a plant to the family level.
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

2. Use plant morphology to categorize the plants on the list to the genus and species level (see chart below).
 - i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits

3. Describe the cultural requirements of these plants.
 - i) moisture
 - ii) light

- iii) soil type
 - iv) hardiness
 - v) nutrients
 - vi) pruning
 - vii) cultivation
4. Identify the considerations for the selection of these plants for specific uses.
 - i) residential applications
 - ii) commercial applications
 - iii) reclamation/restoration
 - iv) location and environment
 5. Select plants for specific applications.

Landscape Horticulturist Plant List by Family

	Family	Latin name	Common name	Character
1	ASTERACEAE	<i>Rudbeckia hirta</i>	Gloriosa Daisy	Annual
2	ASTERACEAE	<i>Helianthus annuus</i>	Sunflower	Annual
3	ASTERACEAE	<i>Cosmos bipinnatus</i>	Cosmos	Annual
4	ASTERACEAE	<i>Dendranthema x morifolium</i>	Garden Mum	Perennial
5	ASTERACEAE	<i>Echinops bannaticus</i>	Globe Thistle	
6	ASTERACEAE	<i>Achillea millefolium</i>	Common Yarrow	Perennial
7	ASTERACEAE	<i>Artemisia schmidtiana</i>	Silver Mound	Perennial
8	ASTERACEAE	<i>Liatris spicata</i>	Blazing Star	Perennial
9	BETULACEAE	<i>Betula pendula</i>	European White Birch	Tree/Shrub
10	BETULACEAE	<i>Corylus cornuta</i>	Beaked Hazelnut	Tree/Shrub
11	BRASSICACEAE	<i>Arabis caucasica</i>	Rock Cress	Annual
12	CAPRIFOLIACEAE	<i>Sambucus racemosa</i>	European Red Elder	Tree/Shrub
13	CARYOPHYLLACEAE	<i>Cerastium tomentosum</i>	Snow-in-Summer	Perennial
14	CORNACEAE	<i>Cornus alba</i>	White Dogwood	Tree/Shrub
15	CRASSULACEAE	<i>Sempervivum tectorum</i>	Hens and Chicks	Perennial
16	CUPRESSACEAE	<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	Tree/Shrub
17	CUPRESSACEAE	<i>Juniperus squamata</i>	Squamata Juniper	Tree/Shrub
18	CUPRESSACEAE	<i>Microbiota decussata</i>	Siberian Cypress	Tree/Shrub
19	FABACEAE	<i>Genista pilosa</i>	Spreading Broom	Tree/Shrub
20	LAMIACEAE	<i>Thymus pseudolanuginosus</i>	Woolly Thyme	Perennial
21	OLEACEAE	<i>Fraxinus pennsylvanica</i> <i>var. subintegerrima</i>	Green Ash	Tree/Shrub
22	OLEACEAE	<i>Syringa meyeri</i>	Meyers Lilac	Tree/Shrub
23	PINACEAE	<i>Larix laricina</i>	Tamarack	Tree/Shrub
24	PINACEAE	<i>Picea pungens</i>	Colorado Spruce	Tree/Shrub
25	RANUNCULACEAE	<i>Aconitum napellus</i>	Monkshood	Perennial
26	RANUNCULACEAE	<i>Aquilegia hybrida</i>	Columbine	Perennial
27	ROSACEAE	<i>Spiraea x vanhouttei</i>	Bridal Wreath Spirea	Tree/Shrub
28	ROSACEAE	<i>Alchemilla mollis</i>	Lady's Mantle	Perennial

	Family	Latin name	Common name	Character
29	ROSACEAE	<i>Physocarpus opulifolius</i>	Common Ninebark	Tree/Shrub
30	SALICACEAE	<i>Populus deltoides</i>	Plains Cottonwood	Tree/Shrub

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select plants for specific applications.

LHT-305 Plant Care and Maintenance

Learning Outcomes:

- Demonstrate knowledge of the procedures used to care and maintain herbaceous and woody plant materials.
- Demonstrate knowledge of procedures used to care and maintain interior plants.

National Occupational Analysis Reference:

- 4.02 Manages growing conditions.
- 8.01 Maintains growing media.
- 8.03 Maintains interior softscape.
- 8.04 Maintains exterior softscape.

Suggested Hours

10 hours

Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to the care and maintenance of plants.
2. Describe the implications of plant care and maintenance on the practice of environmental stewardship.
3. Identify specific tools and equipment relating to care and maintenance and describe their applications and procedures for use.
4. Describe the procedures used to maintain all plant materials.
5. Describe the procedures used for winterization of plant materials.
 - i) wrapping/screening
 - ii) rodent protection
 - iii) bed cleaning
 - iv) cutting back
 - v) mulching
6. Describe the procedures used for recycling and disposing of related waste materials.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Maintain plant materials.
2. Winterize plant materials.

LHT-310 Pruning

Learning Outcomes:

- Demonstrate knowledge of the procedures used to inspect, maintain, store and transport pruning tools and equipment.
- Demonstrate knowledge of the procedures for pruning.
- Demonstrate knowledge of the procedures for the disposal of diseased and infested plant parts.

National Occupational Analysis Reference:

- 8.03 Maintains interior softscape.
- 8.04 Maintains exterior softscape.

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with pruning and pruning related to the removal of diseased and infested plant parts.
2. Identify hazards and describe safe work practices pertaining to pruning and pruning related to the removal of diseased and infested plant parts.
3. Interpret and prepare documentation pertaining to pruning and pruning related to the removal of diseased and infested plant parts.
4. Identify specific tools and equipment relating to pruning and pruning related to the removal of diseased plant parts and describe their applications and procedures for use.
5. Describe the procedures used to inspect, maintain, store and transport pruning tools and equipment.
6. Explain the purpose of pruning.
 - i) plant appearance
 - ii) plant growth requirements
 - coniferous

- iii) - deciduous
plant health
7. Identify pruning methods and techniques and describe their associated procedures.
 - i) heading
 - ii) cleaning/thinning
 - iii) crown raising
 - iv) reduction
 - v) restoration
 - vi) specialized methods
 8. Identify pruning methods related to the removal and disposal of diseased and infested plant parts and describe their associated procedures.
 9. Perform basic pruning techniques.
 10. Clean and sanitize pruning tools and equipment.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Perform basic pruning techniques.
2. Clean and sanitize pruning tools and equipment.

LHT-315 Turf Maintenance

Learning Outcomes:

- Demonstrate knowledge of turf equipment and its care and maintenance.
- Demonstrate knowledge of maintenance practices and procedures.

National Occupational Analysis Reference:

8.02 Maintains grass/turf.

Suggested Hours

16 hours

Objectives and Content:

1. Define terminology associated with turf maintenance.
2. Identify hazards and describe safe work practices pertaining to turf maintenance.
3. Describe the implications of turf maintenance on the practice of environmental stewardship.
4. Interpret and complete documentation relating to turf maintenance.
5. Identify specific tools and equipment relating to turf maintenance and describe their applications and procedures for use.
6. Identify the considerations when determining turf maintenance techniques.
 - i) grass type
 - ii) site use
 - iii) site size
 - iv) cultural requirements
7. Describe the procedures used to inspect and maintain turf maintenance equipment.
8. Identify the considerations for equipment operation on turf.

- i) surface slope
 - ii) obstructions
 - permanent
 - portable
 - iii) site conditions
 - iv) turf use
9. Describe the procedures used to maintain turf.
- i) mowing
 - ii) fertilizing
 - iii) irrigation
 - iv) cultivation
 - aeration
 - dethatching
 - v) top dressing
 - vi) overseeding
 - vii) edging/trimming
10. Identify possible turf problems and describe their causes and the procedures used to correct them.
- i) compaction
 - ii) thatch build-up
 - iii) poor drainage
 - iv) winter kill
 - v) pests
 - weeds
 - insects
 - diseases
 - animals
 - vi) shade
11. Perform inspection and maintenance of turf maintenance equipment.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Maintain turf.
2. Correct turf problems.

LHT-320 Irrigation

Learning Outcomes:

- Demonstrate knowledge of irrigation equipment and systems, their applications and operation.
- Demonstrate knowledge of the procedures used to install, maintain, troubleshoot and repair irrigation equipment and systems.

National Occupational Analysis Reference:

- 7.05 Installs irrigation systems.
- 9.03 Maintains irrigation systems.

Suggested Hours

22 hours

Objectives and Content:

1. Define terminology associated with irrigation.
2. Identify hazards and describe safe work practices pertaining to irrigation.
3. Describe the implications of irrigation on the practice of environmental stewardship.
4. Identify specific tools and equipment related to irrigation and describe their applications and procedures for use.
5. Identify water sources for irrigation and describe the considerations and procedures for determining water quality and availability.
 - i) sample preparation
 - ii) water testing
 - iii) water pressure
 - iv) flow rate
 - v) results interpretation
6. Identify the factors that determine irrigation rates and methods.
 - i) plant materials
 - growth stage

- mature size
 - water use rate
 - ii) root zone assessment
 - iii) soil/water relationship
 - iv) site conditions
 - v) application
 - time
 - rate
 - duration
 - vi) climate
7. Identify the types of irrigation systems.
 - i) drip/low water volume
 - ii) sprinkler
 8. Identify types of irrigation components and describe their applications and procedures for use.
 9. Describe the procedures used to install irrigation equipment and systems.
 10. Describe the procedures used to maintain, troubleshoot, repair and adjust irrigation equipment and systems.
 - i) spring start-up
 - ii) seasonal operation
 - iii) fall shut-down
 11. Install and maintain irrigation equipment.
 12. Repair and adjust irrigation equipment and systems.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Determine irrigation rates and methods.
2. Install and maintain irrigation systems and equipment.

LHT-325 Landscape Walls

Learning Outcomes:

- Demonstrate knowledge of the procedures used to install natural stone and modular precast concrete wall units.
- Demonstrate knowledge of the procedures used to maintain natural stone and modular precast concrete wall units.

National Occupational Analysis Reference:

- 7.04 Installs steps and retaining walls.
- 9.06 Maintains steps and retaining walls.

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with hardscape installation and maintenance.
2. Identify hazards and describe safe work practices pertaining to hardscape installation and maintenance.
3. Describe the implications of landscape walls on the practice of environmental stewardship.
4. Interpret codes, regulations and manufacturer's specifications pertaining to hardscape installation and maintenance.
5. Interpret documentation pertaining to hardscape installation and maintenance.
 - i) plans
 - ii) contract specifications
 - iii) shipping documents
6. Identify specific tools and equipment relating to hardscape installation and maintenance and describe their applications and procedures for use.

7. Identify types of natural stone and modular precast concrete landscape wall units used in hardscape installation and describe their characteristics and applications.
8. Describe the procedures used to prepare for installation of natural stone and modular precast concrete landscape wall units.
9. Describe the procedures used to install natural stone and modular precast concrete wall units.
10. Describe the procedures used to maintain natural stone and modular precast concrete wall units.
11. Install modular wall units.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare site and install landscape wall units.
2. Maintain landscape wall units.

LHT-330 Concrete Construction

Learning Outcomes:

- Demonstrate knowledge of the procedures used to install poured concrete features.
- Demonstrate knowledge of the procedures used to maintain poured concrete features.

National Occupational Analysis Reference:

- 7.02 Installs landscape structures.
- 7.03 Installs walkway, patio, driveway and parking lot materials.
- 7.04 Installs steps and retaining walls.
- 9.02 Maintains walkways, patios, driveways and parking lots.
- 9.06 Maintains steps and retaining walls.
- 9.07 Maintains landscape structures.

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with hardscape installation and maintenance.
2. Identify hazards and describe safe work practices pertaining to hardscape installation and maintenance.
3. Describe the implications of concrete construction on the practice of environmental stewardship.
4. Interpret codes, regulations and manufacturer's specifications pertaining to hardscape installation and maintenance.
5. Interpret documentation pertaining to hardscape installation and maintenance.
 - i) plans
 - ii) contract specifications
 - iii) shipping documents

6. Identify specific tools and equipment relating to hardscape installation and maintenance and describe their applications and procedures for use.
7. Identify concrete products and materials used in hardscape installation and maintenance and describe their characteristics and applications.
8. Describe the procedures used to prepare for installation of poured concrete features.
9. Describe the procedures used to install poured concrete features.
10. Describe the procedures used to maintain poured concrete features.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare site and install poured concrete features.
2. Maintain poured concrete features.

LHT-335 Wood Construction

Learning Outcomes:

- Demonstrate knowledge of the procedures used to construct wood features.

National Occupational Analysis Reference:

- 7.02 Installs landscape structures.
- 7.03 Installs walkway, patio, driveway and parking lot materials.
- 7.04 Installs steps and retaining walls.
- 9.02 Maintains walkways, patios, driveways and parking lots.
- 9.06 Maintains steps and retaining walls.
- 9.07 Maintains landscape structures.

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with hardscape installation and maintenance.
2. Identify hazards and describe safe work practices pertaining to hardscape installation and maintenance.
3. Describe the implications of wood construction on the practice of environmental stewardship.
4. Interpret codes, regulations and manufacturer's specifications pertaining to hardscape construction and maintenance.
5. Interpret documentation pertaining to hardscape installation and maintenance.
 - i) plans
 - ii) contract specifications
 - iii) shipping documents

6. Identify specific tools and equipment relating to wood feature construction and maintenance and describe their applications and procedures for use.
7. Identify products and materials used in wood feature construction and maintenance and describe their applications and procedures for use.
 - i) natural timber and wood
 - ii) engineered and composite wood
8. Describe the procedures used to prepare for installation of hardscape materials.
9. Describe the procedures used to install landscape wood features.
10. Describe the procedures used to maintain landscape wood features.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare site and install wood features.
2. Maintain wood features.

LHT-340 Water Features and Low Voltage Landscape Lighting

Learning Outcomes:

- Demonstrate knowledge of the design, installation and maintenance of landscape water features.
- Demonstrate knowledge of the design, installation and maintenance of low voltage landscape lighting.

National Occupational Analysis Reference:

- | | |
|------|--|
| 7.06 | Installs water features. |
| 7.07 | Installs low voltage landscape lighting. |
| 9.04 | Maintains landscape lighting. |
| 9.05 | Maintains water features. |

Suggested Hours

18 hours

Objectives and Content:

1. Define terminology associated with water features and low voltage landscape lighting.
2. Identify hazards and describe safe work practices pertaining to water features and low voltage landscape lighting.
3. Describe the implications of water features and lighting on the practice of environmental stewardship.
4. Interpret codes and regulations pertaining to water features and low voltage landscape lighting.
5. Interpret documentation pertaining to water features and low voltage landscape lighting.
6. Identify types of water features and describe their characteristics and applications.
7. Describe the procedures used to install water features.

8. Describe the procedures used to maintain, troubleshoot and repair water features.
9. Identify types of low voltage landscape lighting and describe their characteristics and applications.
10. Describe the procedures used to install low voltage landscape lighting.
11. Describe the procedures used to maintain, troubleshoot and repair low voltage landscape lighting.
12. Install and maintain, troubleshoot and repair low voltage landscape lighting.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Prepare site and install water features.
2. Maintain water features.
3. Prepare site and install low voltage landscape lighting.
4. Maintain low voltage landscape lighting.

LHT-345 Interior Plantscapes

Learning Outcomes:

- Demonstrate knowledge of interior plants, their characteristics and cultural requirements.
- Demonstrate knowledge of the procedures used to install and maintain interior plantscapes.

National Occupational Analysis Reference:

- 2.02 Uses documentation and reference material.
- 4.01 Identifies plants and plant requirements.
- 4.02 Manages growing conditions.
- 6.03 Installs interior landscape plants.
- 8.03 Maintains interior landscape plants.

Suggested Hours

14 hours

Objectives and Content:

1. Define terminology associated with interior plantscaping.
2. Identify hazards and describe safe work practices pertaining to interior plantscaping.
3. Interpret codes and regulations pertaining to interior plantscaping.
4. Describe the implications of interior plantscaping on the practice of environmental stewardship.
5. Interpret and complete documentation pertaining to interior plantscaping.
6. Identify specific tools and equipment relating to interior plantscaping and describe their applications and procedures for use.
7. Use plant morphology to categorize the plants on the list to the genus and species level (see chart below).

- i) leaves/needles
 - ii) flowers/fruits/seeds
 - iii) buds
 - iv) bark
 - v) growth habits
8. Describe the cultural requirements of these plants.
- i) moisture
 - ii) light
 - iii) soil type
 - iv) hardiness
 - v) nutrients
 - vi) propagation
 - vii) salt tolerance
9. Identify the considerations for the selection of these plants for specific interior uses.
10. Describe the procedures used to install and maintain interior plants.
11. Select plants for specific applications.

Landscape Horticulturist Interior Plant List by Family

	Family	Latin name	Common name	Character
1	AGAVACEAE	<i>Dracaena marginata</i>	Dragon Tree	Tropical/Indoor
2	ALOEACEAE	<i>Aloe vera</i>	Healing Plant	Tropical/Indoor
3	ARACEAE	<i>Dieffenbachia amoena</i>	Dumb Cane	Tropical/Indoor
4	ARACEAE	<i>Epipremnum aureum</i>	Pothos/Devil's Ivy	Tropical/Indoor
5	ARACEAE	<i>Monstera deliciosa</i>	Monster Plant	Tropical/Indoor
6	ARACEAE	<i>Philodendron selloum</i>	Tree Philodendron	Tropical/Indoor
7	ARACEAE	<i>Spathiphyllum cannifolium</i>	Peace Lily	Tropical/Indoor
8	ARALIACEAE	<i>Hedera helix</i>	English Ivy	Tropical/Indoor
9	ARALIACEAE	<i>Schefflera arboricola</i>	Hawaiian Elf Schefflera	Tropical/Indoor
10	ARAUCARIACEAE	<i>Araucaria heterophylla</i>	Norfolk (Island) Pine	Tropical/Indoor
11	CRASSULACEAE	<i>Crassula ovata</i>	Jade Plant	Tropical/Indoor
12	EUPHORBIACEAE	<i>Codiaeum variegatum var. pictum</i>	Croton	Tropical/Indoor
13	MORACEAE	<i>Ficus benjamina</i>	Weeping Fig	Tropical/Indoor
14	MORACEAE	<i>Ficus elastica</i>	India Rubber Plant/Rubber Tree	Tropical/Indoor

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Select and install plants for interior plantscapes.

LHT-350 Estimating

Learning Outcomes:

- Demonstrate knowledge of the procedures used to calculate and estimate job requirements.

National Occupational Analysis Reference:

3.04 Performs estimating, tendering and contracting.

Suggested Hours

28 hours

Objectives and Content:

1. Define terminology associated with estimating.
2. Identify sources of information pertaining to estimating.
3. Identify specific tools relating to estimating and describe their applications and procedures for use.
4. Describe the procedures used to calculate material requirements.
 - i) lengths
 - ii) surface areas
 - iii) volumes
 - iv) rates of application
 - v) expansion/compaction factors
 - vi) shipping quantities
5. Describe the procedures used to calculate equipment requirements.
 - i) equipment types/costing
 - ii) production rates
 - iii) transportation
6. Describe the procedures used to calculate labour requirements.
 - i) individual tasks
 - ii) production rates
 - iii) person-hours

7. Identify job requirements.
 - i) overhead costs
 - ii) general conditions
 - iii) profit margins
8. Calculate and estimate job requirements.

Performance Outcomes:

Upon completion of this course, the apprentice will be able to:

1. Calculate and estimate job requirements.