

Landscape Horticulturist Level 4

Landscape Horticulturist

Unit: D1 Plant Identification 4

Level: Four

Duration: 24 hours

Theory: 20 hours

Practical: 4 hours

Overview:

Upon completion of this unit of instruction the apprentice will demonstrate knowledge of additional plants, their characteristics and cultural requirements. This unit also serves as a review and continuation of the content in *Plant Identification 1, 2, and 3*.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Use plant morphology to categorize a plant to the family, genus and species level.	25%
a. Leaves/needles	
b. Flowers/fruits/seeds	
c. Buds	
d. Bark	
e. Growth habits	
2. Describe the cultural requirements of these plants.	25%
a. Moisture	
b. Light	
c. Soil type	
d. Hardiness	
e. Nutrients	
f. Propagation	
g. Tolerance	
3. Identify the considerations for the selection of these plants for specific uses (see partial list below. Additional list to be supplied by instructor).	25%
a. Residential applications	
b. Commercial applications	
c. Reclamation/restoration	
d. Location and environment	
4. Select plants for specific applications.	25%

Landscape Horticulturist Plant List by Family

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

Landscape Horticulturist

Unit: D2 Estimating

Level: Four

Duration: 28 hours

Theory: 21 hours

Practical: 7 hours

Overview:

Upon completion of this unit of instruction the apprentice will demonstrate knowledge of the procedures used to calculate and estimate job requirements.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with estimating.	5%
2. Identify sources of information pertaining to estimating.	5%
3. Describe the procedures used to calculate requirements for estimates. a. Labour b. Materials c. Equipment d. Factoring spoilage	35%
4. Identify job requirements. a. Overhead costs b. General conditions c. Profit margins	30%
5. Demonstrate the ability to calculate and estimate job requirements.	25%

Landscape Horticulturist

Unit: D3 Job Planning 2

Level: Four

Duration: 10 hours

Theory: 5 hours

Practical: 5 hours

Overview:

Upon completion of this unit the apprentice will demonstrate knowledge of trade-related documentation and of the procedures used to plan job tasks. This unit also serves as a review and continuation of the content in *Job Planning 1*, in Level 3.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with job planning.	5%
2. Identify hazards and describe safe work practices pertaining to job planning.	5%
3. Identify types of trade-related documentation and describe their applications and procedures for use.	15%
a. Drawings	
b. Qualifications	
c. Specifications	
d. Codes and standards	
e. Manuals	
f. Permits	
g. Regulations	
h. Policies	
i. Guidelines	
j. Tenders and contracts	
k. Site locates	
l. Product instructions	
4. Identify the project considerations and requirements when planning jobs and job tasks.	50%
a. On-site staging	
b. Clean-up/debris removal	
c. Weather	
d. Competing projects	
e. Designated timelines	
f. Jurisdictional regulations	
g. Scheduling	

- | | | |
|-----------|--|------------|
| 5. | Explain the importance of accurate record keeping and describe the associated procedures. | 5% |
| 6. | Demonstrate the ability to plan job tasks and maintain accurate records. | 20% |

Landscape Horticulturist

Unit: D4 Pest and Disease Management 2

Level: Four

Duration: 25 hours

Theory: 20 hours

Practical: 5 hours

Overview:

Upon completion of this unit the apprentice will demonstrate knowledge of codes and regulations pertaining to pest and disease management, types of pests and diseases and the procedures used to manage them, the procedures to handle, transport, apply, store and dispose of pest and disease management products and tools, and of pest control products, formulations and application equipment. This unit also serves as a review and continuation of the content in *Pest and Disease Management 1*, in Level 3.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
<p>1. Identify methods used for pest and disease management and treatment.</p> <ul style="list-style-type: none"> a. Regulatory b. Physical/mechanical c. Cultural d. Biological e. chemical 	10%
<p>2. Identify hazards and describe safe work practices pertaining to pest and disease management.</p>	15%
<p>3. Interpret and complete documentation pertaining to pest and disease management.</p> <ul style="list-style-type: none"> a. Pest and disease monitoring b. Treatment and management records c. Evaluation of pest and disease management methods. d. Pesticide application records 	5%
<p>4. Identify biotic and abiotic factors.</p> <ul style="list-style-type: none"> a. Biotic <ul style="list-style-type: none"> • Diseases • Insects • Animals b. Abiotic <ul style="list-style-type: none"> • Temperature • Light • Mechanical damage • Nutrition 	15%

5. **Identify common types of diseases and disorders in relation to the landscape and describe their characteristics.** 25%
- a. Biotic
 - b. Abiotic
 - c. Blight
 - d. Leaf spot
 - e. Scab
 - f. Gall
 - g. Rust
 - h. Canker
 - i. Bacterial wilts
 - j. Fungi
 - k. Rot & mildew
 - l. Bacterial and fungal turfgrass diseases
6. **Identify the considerations for selecting and applying pest and disease management measures.** 5%
- a. Site analysis
 - b. Pest/disease populations
 - c. Injury levels
 - d. Action thresholds
 - e. Beneficial insect populations
 - f. Monitoring techniques
7. **Identify specific tools and equipment relating to pest and disease management and describe their applications and procedures for use.** 5%
8. **Describe the procedures used to implement pest and disease management measures.** 10%
- a. Management techniques
 - b. Preparation
 - c. Equipment selection
 - d. Equipment calibration
 - e. Application techniques
9. **Describe the procedures used to handle, transport, store and dispose of pest and disease management related products and materials.** 5%
10. **Demonstrate the ability to select, apply and record pest and disease management measures.** 5%

Landscape Horticulturist

Unit: D5 Landscape Design

Level: Four

Duration: 49 hours

Theory: 39 hours

Practical: 10 hours

Overview:

Upon completion of this unit the apprentice will demonstrate knowledge of landscape plans and how to prepare them.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Identify types of landscape plans and documentation and describe their characteristics and applications.	5%
2. Describe the procedures and techniques used in site assessment for landscape design.	15%
3. Interpret information on landscape plans.	5%
4. Describe the considerations in creating landscape designs. a. Client preferences b. Existing site conditions c. Jurisdictional regulations	30%
5. Describe the applications of design principles in landscape drawings. a. Texture b. Colour c. Form d. Scale e. Balance f. Repetition g. Unity	25%
6. Demonstrate the ability to prepare landscape plans.	20%

Landscape Horticulturist

Unit: D6 Plant Production

Level: Four

Duration: 47 hours

Theory: 47 hours

Practical: 0 hours

Overview:

Upon completion of this unit of instruction the apprentice will demonstrate knowledge of the procedures associated with plant production.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with plant production.	5%
2. Identify hazards and describe safe work practices pertaining to plant production.	5%
3. Describe the implications of plant production on the practice of environmental stewardship.	5%
4. Identify codes and standards relating to plant production.	5%
a. Nursery certification requirements	
5. Interpret and complete documentation relating to plant production.	5%
6. Identify specific tools, equipment and structures relating to plant production and describe their applications and procedures for use.	10%
a. Field production	
b. Containerized production	
c. Greenhouse production	
7. Describe the procedures used to develop greenhouse and nursery crop production plans.	10%
a. Production planning schedule	
b. Growing facility capacities	
c. Market demand	
d. Desired saleable quantities	
e. Quantities and materials	
8. Describe the procedures used to propagate greenhouse, field and container crops.	5%
a. Propagation methods	

- b. Seeding methods
 - c. Cutting methods
 - d. Budding methods
 - e. Grafting methods
 - f. Dividing and separation methods
 - g. Layering methods
 - h. Micro-propagation methods
 - i. Selecting stock/parent plants
 - j. Maintaining stock/parent plants
 - k. Maintaining post-propagated plants
- 9. Describe the procedures used for transplanting greenhouse, field and container crops. 10%**
- a. Criteria for timing
 - b. Transplanting procedures
 - c. Environmental factors
 - Temperature
 - Humidity
 - Light levels
 - Soil moisture
 - Ventilation
- 10. Describe the procedures used for growing greenhouse, field and container crops. 20%**
- a. Water quality requirements
 - b. Cultural requirements
 - c. Characteristics
 - d. Environmental deficiencies
 - Excess or insufficient light
 - Fertilizer/nutrients
 - Temperature
 - Water
 - e. Pests and diseases
 - f. Interventions
 - g. Crop groupings
 - h. Hardening-off process
- 11. Describe the procedures used for harvesting and shipping greenhouse, field and container crops. 10%**
- a. Harvesting and handling
 - Storage
 - Grading
 - Labeling
 - shipping
 - b. Shipping
 - Packing and loading
 - Climate control
 - Documentation
 - Loading equipment
 - Packaging materials
 - Covering materials
- 12. Describe the procedures used for winterizing greenhouse, field and container crops. 10%**

Landscape Horticulturist

Unit: D7 Environmental Practices 4

Level: Four

Duration: 22 hours

Theory: 15 hours

Practical: 7 hours

Overview:

Upon completion of this unit of instruction the apprentice will demonstrate knowledge of the procedures associated with environmental practices with an emphasis on biodiversity enhancement. This unit also serves as a review and continuation of the content in *Environmental Practices 1, 2, and 3*.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define biodiversity and describe the value and purpose of it.	10%
2. Identify the jurisdictional regulations related to biodiversity.	5%
3. List the benefits of plants.	10%
a. Climate change mitigation	
b. Carbon capturing	
c. Symbiotic relationships	
4. Describe the value of environmental, economic and social impact of the tree canopy.	5%
5. Explain the inter-relationships between species.	5%
6. Identify native species, plant varieties and organisms that ensure diversity within landscapes.	5%
7. Identify the differences between invasive and native species.	5%
8. Describe bio-diverse enhancement strategies.	20%
a. Selecting plants that attract pollinators and wildlife	
b. Ensuring inter-relationships in nature	
c. Creating or maintaining wetlands	
d. Changing maintenance practices to preserve habitat by cleaning up in the spring	
e. Creating habitat and structures	
f. Encouraging moss growth	

- | | |
|--|------------|
| 9. Describe the purpose and procedure for including edible plants in landscapes. | 10% |
| 10. Define a variety of habitats to support a range of species. | 10% |
| 11. Describe pest and disease control methods that are compatible with a variety of organisms. | 5% |
| 12. Explain the benefit of and risks of not including biodiversity within a landscape design and the development process. | 10% |

Landscape Horticulturist

Unit: D8 Green Infrastructure

Level: Four

Duration: 40 hours

Theory: 30 hours

Practical: 10 hours

Overview:

Upon completion of this unit of instruction the apprentice will demonstrate knowledge of the procedures associated with the installation and maintenance of green infrastructure.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe the factors to consider in selecting green infrastructure.	20%
a. Types	
b. Benefits	
c. Xeriscape principles	
d. Environmental, economic social impacts	
e. Natural ecosystems	
f. Jurisdictional regulations	
g. Field reclamation	
h. Smart water technology	
i. Site sustainability	
j. Landscape design	
k. Surface/subsurface drainage	
l. Filtration	
m. Low impact development	
2. Describe the procedures to install green roofs and walls.	15%
a. Non-organic components	
b. Growing media	
c. Plant material	
d. Components	
e. Fall protection	
3. Describe the procedures to install rainwater and stormwater management systems.	15%
a. Functions	
b. Components	
c. Codes and regulations	
d. Retention systems	

- e. Benefits
- 4. **Describe the procedures to install erosion control materials.** **10%**
 - a. Applications
 - b. Methods
 - c. Estimating quantities
- 5. **Identify the factors to consider in installing biodiverse plantings and natural areas.** **15%**
 - a. Function
 - b. Benefits
 - c. Regulations
 - d. Plant material
- 6. **Describe the procedures to maintain green roofs and walls.** **5%**
 - a. Extensive and intensive roofs
 - b. Use/functionality of different systems
 - c. Structural loads
 - d. Plant materials
 - e. Growing media
 - f. Components
 - g. Hazards
 - h. Tools and equipment
 - i. Repair
 - j. Fall protection
- 7. **Describe the procedures to maintain rainwater and stormwater management systems.** **5%**
 - a. Testing water and soil quality
 - b. Signs of erosion
 - c. Sedimentation
 - d. Plant maintenance requirements
- 8. **Describe the procedures to maintain erosion control.** **5%**
- 9. **Describe the procedures to maintain biodiverse plantings and natural areas.** **5%**
- 10. **Demonstrate the ability to install and maintain green infrastructure.** **5%**

Landscape Horticulturist

Unit: D9 Journeyperson Trainer

Level: Four

Duration: 7 hours

Theory: 7 hours

Practical: 0 Hours

Overview:

Level One in-school Technical Training offers an entry-level orientation to the challenges of apprenticeship training as it relates to the development of core tasks and skill requirements as well as social competencies. This unit introduces senior apprentices to the responsibilities of workplace *training* that they will assume as supervising journeypersons. Most trades have a rich tradition of refreshing and sharing their skills from one generation of trades practitioners to the next. This unit orients senior apprentices to some of the practical and conceptual tools that can enable them to contribute to this trade heritage when they become certified journeypersons and, ultimately, journeyperson trainers.

The journeyperson's obligation to assist entry-level apprentices to develop skills and knowledge is complex and challenging. It involves safety considerations, employer expectations, provincial regulations, as well as the tradition of skills stewardship that links modern practice with the long history of workplace teaching and learning that defines the apprenticeable trades. The ability to offer timely and appropriate support to apprentices is itself an important area of trade learning. This unit presents material intended to help refine this ability through reflection and discussion by senior apprentices, and discussion with their in-school instructor and journeyperson trainer.

This content reflects Manitoba and Canadian standards prescribed for journeyperson-level supervisory capabilities, as well as key topics in current research on the importance of workplace training in apprenticeship systems. The unit objectives represent suggested focal points or guidelines for potentially-worthy exploration and are neither mandatory nor exhaustive.

Please note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a 'Pass/Fail' grade will recorded for the unit in its entirety.

Objectives and Content:

**Percent of
Unit Mark (%)**

- | | |
|--|------------|
| <ol style="list-style-type: none"> 1. Compare/contrast role-options and responsibilities of the supervising journeyperson. <ol style="list-style-type: none"> a. Implicit vs. explicit standards and content: training goals are/are not codified; assessment measures are/are not used. b. Accountability for results: e.g., journeyperson is/is not required to prepare performance evaluation that could affect apprentice's employability or wage-rate, etc. c. Long-term vs. short-term supervision assignments – e.g., considerable latitude/little latitude for apprentice to learn from mistakes d. Formally vs. informally structured: e.g. supervision assignment is part of a prescribed cycle of assignments involving coordination among multiple journeypersons; apprentice is trained according to an individual Training Plan negotiated with employer e. Types of supervisory role options and what is implied by each: | <p>n/a</p> |
|--|------------|

- Journeyperson Trainer (JT) role: is often initiated by someone other than apprentice, and limited to a particular skill set, task, or production requirement
- Mentor role : often initiated by apprentice and relatively open-ended regarding content, duration, etc.
- Peer role: typically involves individual upgrading or cross-training of one journeyperson by another; can include senior apprentice assisting less-experienced trade learner
- Coordinator role: often a senior-level journeyperson appointed by an organization to assume responsibilities for monitoring progression of groups of apprentices
- Other roles: may be improvised by journeyperson such as combination or multiple roles of the above

2. Describe and demonstrate common requirements about providing journeyperson supervision. n/a

- Apprenticeship learning adapted to journeyperson supervision assignments and a journeyperson perspective
 - Application of adult education concepts to trades teaching and learning (e.g. responsibilities and expectations of senior-level apprentices))
 - Practical significance of ‘styles’ of adult learning and teaching
 - Helping senior-level apprentices to integrate in-school technical training and on-the-job practical training experiences
 - Providing help and guidance about new tasks and skills
 - Providing help and guidance about fixing mistakes
 - Learning and teaching “the ropes” – socialization of apprentice within a community of trade practice (e.g. how to borrow a tool, interrupt a journeyperson, seek advice of experienced co-workers)
 - Coverage and documentation of prescribed tasks and subtasks where applicable
 - Discuss the limits of the journeyperson trainer’s own responsibilities and competence (e.g. scope, willingness to train, etc.)
 - Benefits of maintaining a personal record of achievements, ideas, and needs as a journeyperson trainer (e.g. resume, portfolio, training credentials, logbook, etc.)
- Individual reflection and guided group discussion about personal experiences of workplace learning as an apprentice
 - Identification of best and worst practices of journeyperson trainer
 - Identification of workplace and other factors that can contribute to good and bad trades teaching and learning experiences
 - Development of professional standards and work ethics about responsibility to share one’s knowledge and skill with others in the workplace (e.g., use/misuse of humour, rigour, discretion, craft-pride, etc.)
 - Qualities of a good journeyperson trainer
 - Components of workplace journeyperson training
 - Processes and recommended practices in journeyperson training
 - Troubleshooting problems in supervision assignments
- Role of assessment in supervising, coaching, or guiding other people to learn or improve their skills (e.g. formative and summative evaluation), and how this might contribute to how the journeyperson supervision task is approached in future
- Compare and contrast discussion results with current knowledge and resources about workplace training methods as they apply to journeyperson supervision assignments

Landscape Horticulturist

Unit: D10 Pre-Certification Exam Review

Level: Four

Duration: 28 hours

Theory: 28 hours

Practical: 0 hours

Overview:

This unit offers senior apprentices a systematic review of skills and knowledge required to pass the certification exam. It promotes a purposeful personal synthesis between on-the-job learning and the content of in-school technical training. The unit includes information about the significance of certification and the features of the examination.

Please note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a 'Pass/Fail' grade will be recorded for the unit in its entirety.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
<p>1. Describe the significance, format, and general content of examinations for the trade.</p> <ul style="list-style-type: none"> a. Scope, aims and value of certification b. Obligations of candidates for certification <ul style="list-style-type: none"> • Relevance of certification exam on to current accepted trade practices; industry-based validation of test items • Supplemental Policy (retesting) • Confidentiality of examination content c. Multiple-choice (four-option) item format; Red Seal standards for acceptable test items d. Government materials relevant to the certification examination <ul style="list-style-type: none"> • Red Seal Occupational Standard (RSOS); prescribed scope of the skills and knowledge which comprise the trade • RSOS 'pie-chart' and its relationship to content distribution of certification examination items • Apprenticeship Manitoba Technical Training package 	n/a
<p>2. Identify resources, strategies, and other considerations for maximizing successful completion of certification exams.</p> <ul style="list-style-type: none"> a. Personal preparedness <ul style="list-style-type: none"> • Rest nutrition • Nutrition • Personal study regimen 	n/a

- Prior experience in test situations (e.g. Unit Tests)
 - b. Self-assessment, consultation, and personal study plan
 - Self-assessment of individual strengths/weaknesses in trade-related skills and knowledge
 - Approved textbooks
 - Study groups
-
- | | | |
|-----------|---|------------|
| 3. | Review program content: common occupational skills. | n/a |
| 4. | Review program content: horticultural principles. | n/a |
| 5. | Review program content: landscape construction. | n/a |
| 6. | Review program content: landscape maintenance. | n/a |
| 7. | Review program content: production of plant materials. | n/a |