Chapter 5. Laws, Regulations, Guides, Ethics, and Professionalism
A. Demonstrate knowledge of Federal, State, and Local Regulations pertaining to the Nursery Industry.
B. Identify professional and ethical practices for the Nursery Industry.
C. Demonstrate knowledge of MNLA’s Constitution and Bylaws.

Chapter 6. Environmental Management
A. Describe ecological issues associated with maintaining a sustainable landscape.
B. Explain when and how fertilizers and pesticides may pose a threat to the environment and how they benefit the environment.
C. Explain why water, soil, and energy conservation are important.
D. Explain relative aggressiveness versus invasiveness of plants versus noxious weeds.
E. Explain Federal, State, and Local Regulations of noxious weeds.

Chapter 7. Occupational Health and Safety
A. Identify and describe safety practices in the workplace.
B. Identify and explain the symptoms of occupational health hazards.
C. Identify and explain actions to take and actions to avoid during emergency situations.

Chapter 8. Shipping and Handling
A. Describe how Bare Root, Container and B&B products should be handled while being transported.
B. Identify which Federal Plant Pest Quarantines affect Minnesota.
C. Describe procedures required for shipment of plant material into the state.

Chapter 9. American Standard for Nursery Stock
A. Describe common techniques for measuring Bare Root, Container and B&B plants.
B. Explain common techniques for specifying and stating the size of plants.
C. Explain common techniques for determining the proper relationship between height and caliper, or height and width.
D. Explain common techniques for determining whether a root ball or container is large enough for a particular size plant.

Chapter 10. Nursery and Landscape Associations (No learning objectives needed)

Chapter 11. Plant Nomenclature and Classification
A. Explain the need for a universal nomenclature system.
B. Describe the binomial nomenclature system.
C. Describe various systems for classification of plants.

Chapter 12. Plant Structure
A. Describe various plant organs and how they are used as a basis for classifying plants.
B. Explain the structural differences between dicot and monocot stems.
C. Identify and describe the reproductive structures of plants.
D. Explain the functions of plant structures.

Chapter 13. Plant Growth and Development
A. Describe specific growth processes – photosynthesis, respiration, transpiration, translocation, and absorption – and their roles in plant growth and development.
B. Identify and describe the stages of plant growth.
C. Explain the role of plant hormones in plant growth and development.

Chapter 14. Plant Cold Hardiness and Winter Protection
A. Explain plant cold hardiness physiology.
B. Identify and describe the types of winter injury.
C. Describe production and cultural practices employed to avoid winter cold injury.
Chapter 15. Annual Flowers
A. Explain what is involved in an annual completing its life cycle in one year.
B. Identify and explain the requirements for light, soil and nutrition in annual plants.
C. Identify annual plant diseases and insect pests and their control.
D. Describe advantages and disadvantages of growing annuals.
E. Explain characteristics of annual plants that make them suitable for specific landscape uses.

Chapter 16. Fruit Trees and Small Fruits
A. Identify the planting and cultural requirements for growing Fruit Trees.
B. Explain why and how pruning of Fruit trees may differ from pruning shade trees.
C. Recommend varieties of tree fruits and small fruits appropriate for specific environmental or edaphic sites.
D. Identify and understand terms associated with fruit quality characteristics.

Chapter 17. Ground Covers
A. Identify specific landscape circumstances in which groundcovers are effective.
B. Identify appropriate ground cover plants that provide specific landscape solutions.
C. Identify and describe installation and cultural practices for growing groundcovers.

Chapter 18. Herbaceous Perennials
A. Explain the planting and maintenance requirements of perennial plants.
B. Identify the bloom season, color and size of commonly used perennials.
C. Explain the pruning requirements of perennials in production and in the landscape.
D. Identify and explain the propagation methods used for most perennial plants.
E. Describe the advantages and disadvantages of growing perennials commercially and in the landscape.

Chapter 19. Indoor Flowering and Foliage Plants
A. Describe the various light requirements of indoor plants including examples of plants in each light level.
B. Describe the cultural requirements for growing indoor plants.
C. Identify and explain plant issues specific to indoor plants.

Chapter 20. Landscape Grasses
A. Identify specific landscape circumstances in which grasses are effective.
B. Describe the culture, growth habits, life cycle, flowering and color of specific landscape grasses.
C. Explain hardiness issues and winter-care of landscape grasses.

Chapter 21. Roses
A. Explain the difference between hybrid tea roses and hardy shrub roses and their culture.
B. Identify the best varieties of roses for various planting sites.
C. Explain how to plant a hybrid tea rose and a shrub rose and explain the differences in fertilizer requirements, insect and disease control, and their preparation for winter.

Chapter 22. Trees, Shrubs, and Woody Vines
A. Describe the differences between invasive and non-invasive species and explain the significance of this to the industry.
B. Describe the differences between gymnosperms and angiosperms and provide examples of each.
C. Identify the factors considered when selecting plant material for specific sites.
D. Identify which plants will thrive in various environmental and edaphic sites.
E. Identify trees shrubs and vines via specific plant characteristics in their growing and dormant stages.

Chapter 23. MNLA Certification Plant Identification Resource
A. Explain the importance of genus, species and variety in plant classification.
B. Identify the plants in the photo Plant Identification Resource CD.
C. Explain the USDA Plant Hardiness Zones and the reasons for their use.
Chapter 24. MNLA Plant Material and Landscape References
A. Identify the symbols that provide quick reference of trees & shrubs performance.
B. Identify plants in the perennial reference that include fragrance, butterfly & humming bird attraction, and cut flowers.
C. Identify sources of colorful elements that can be added to the landscape garden.

Chapter 25. Soils for Nursery and Landscape Management
A. Identify and describe the components of soil.
B. Explain what soil structure is and its effect on plants.
C. Explain what soil texture is and its effect on plants.
D. Explain what compaction is and its effect on soil structure and plant growth.
E. Identify and describe the reasons for, the effects of, the benefits of, any problems incurred, and the conditions for, adding amendments to soils.
F. Explain the optimum pH ranges for plants and explain why they are optimum.
G. Identify and explain the benefits, problems and conditions associated with adding amendments to soil.

Chapter 26. Fertilization for Nursery and Landscape Management
A. Identify and describe what nutrient elements are required for plant growth and the magnitude and form in which they are absorbed.
B. Explain the function of nutrient elements in the plant and their symptoms of excess and deficiency.
C. Explain the fertilizer label, application rates, equipment calibration and the types of fertilizer to apply for specific uses.
D. Describe why a soil test may be a good indicator of what plants in a field or landscape require, and why it may not be a good indicator.
E. Describe how to obtain a meaningful soil sample.

Chapter 27. Planting and Transplanting
A. Identify the factors which indicate what plants should be planted in various sites.
B. Describe the different types of packaging required for plants including Bare Root, Packaged, Field-potted, Container Grown, Containerized, Balled & Burlapped, and Spaded, and explain their application in the industry.
C. Explain the details of the Gopher State 1 System and explain why it is important and by whom it is administered.
D. Explain why planting depth is critical and describe the proper planting procedure for Bare Root and B&B plants.

Chapter 28. Irrigation Management
A. Explain the water requirements of plants in general and identify the water requirements of some specific plants.
B. Identify the various types of Irrigation systems and describe their application in the industry.
C. Explain uniformity of irrigation application, why it is important and how is it achieved.
D. Explain how to determine water stress in plants, both drought and over-watering, and describe corrective measures.

Chapter 29. Pruning Trees, Shrubs, Evergreens, and Perennials in the Nursery & Landscape
A. Describe the horticultural practices involved in the science and art of pruning.
B. Identify the key principles of pruning and describe the proper methods for removing branches.
C. Identify the proper pruning time of trees, shrubs, and evergreens, and the reasons why.
D. Describe the relationship between pruning and plant diseases including specific examples.

Chapter 30. Landscape Management
A. Describe the major components and responsibility of general landscape management.
B. Explain the diagnostic procedures used in landscape management.
C. Identify and describe several plant problems, their possible causes, and their potential control or corrective procedures.
Chapter 31. Professional Gardener
A. Identify the areas one must be knowledgeable in to be a professional gardener.
B. Describe the seasonal timelines and activities of a professional gardener.
C. Identify garden maintenance requirements of a professional gardener.

Chapter 32. Turf Management
A. Identify turfgrasses suitable for various sites for lawns in Minnesota and why they are applicable.
B. Describe how to determine if a lawn should be established by seeding or sodding and describe the procedures for each.
C. Explain how to maintain turfgrass including, but not limited to, mowing, fertilizing, irrigation, aerification, thatch control, weed control, disease control, and insect control.

Chapter 33. Garden Center Plant Management
A. Identify and explain the factors that influence the customer’s decision to shop at a certain garden center.
B. Describe the importance of high quality plant material and explain how to provide a “Production Mode” to maintain quality plants.
C. Describe the potting, packaging, labeling, displaying, and over-wintering of plant material and how to promote plants throughout the selling season.

Chapter 34. Vegetables
A. Identify and describe vegetables types and their culture requirements including their approximate crop production timing schedules.
B. Identify and explain site and soil preparations for a vegetable garden including raised beds and container gardening.
C. Identify and explain fertility requirements and pest control measures for vegetable gardens of all types.
D. Describe warm and cold season crops and identify examples of each for various locations in Minnesota.

Chapter 35. Water Gardens
A. Identify and describe different types of ponds and water features.
B. Identify and describe materials, both synthetic and natural, used in pond construction.
C. Describe the nitrogen cycle of a pond and explain how to obtain a balanced ecosystem.
D. Identify and describe appropriate plants for different types of ponds.
E. Explain the basics of water-garden maintenance.

Chapter 36. Pesticide Management
A. Describe IPM and PHC and explain why they are important.
B. Describe Pesticides relative to their toxicity, their formulation and their chemical class.
C. Describe Pesticide Labels, Laws, and Regulations, and explain their impact and importance.
D. Understand the meaning of all Pesticide Terminology.
E. Describe Pesticide mixing, application and storage.
F. Describe chronic and acute toxicity and explain their importance.
G. Describe general safety rules and how to prevent toxic exposure and accidents.
H. Identify some of the signs and symptoms of poisoning and their treatment.

Chapter 37. Disease Management
A. Identify and explain the categories of plant diseases.
B. Explain the concept of what a disease is and describe the details of what is required to cause a plant disease.
C. Explain the need for correct identification of the causal agent of a plant disease and describe the factors in diagnosing a plant disease.
D. Identify certain diseases that are specific to specific plants and explain their control.
E. Identify and explain the numerous cultural practices effective in the control of plant diseases.
F. Identify and describe the causal agents of plant diseases and explain how they differ from each other.
Chapter 38. Insect Management
A. Identify and describe the types of insect damage and how they are diagnosed.
B. Identify specific insects that infest specific plants.
C. Identify and explain the conditions and factors that can lead to insect infestations.
D. Describe host plant resistance and explain why it is important.
E. Describe biological control and explain when it may or may not be effective.
F. Identify and define the categories of insecticides and explain when and how they should be used.
G. Explain the concept of degree days and describe how this concept is used to predict pest activity.
H. Identify and describe which insecticides control what insects or groups of insects.

Chapter 39. Weed Management
A. Describe the various types of weeds.
B. Explain the proper site preparation relative the control of weeds with and without herbicides.
C. Identify and describe various types of weed control.
D. Describe the classification of herbicides and explain when each should be used and how they should be used.
E. Identify specific herbicides in all categories and which weeds they will control.
F. Describe the herbicide label and explain why it is important.
G. Identify specific herbicides that can be used on what crops and which herbicides may cause injury to what plants.

Chapter 40. Plant Propagation
A. Identify and describe the types of propagation and the methods used to propagate plants.
B. Understand seed dormancy and how treat seeds for the different types of dormancy.
C. Describe the various types of propagation facilities including their requirements and advantages and disadvantages of each.

Chapter 41. Container Production
A. Identify container media components and explain the function of each.
B. Describe how the shape of container is important and its effect on plant growth.
C. Explain the need and the process of media testing and analysis.
D. Identify and describe the chemical properties of container media.
E. Identify and describe the physical properties of container media.
F. Explain media porosity and aeration and how they are controlled.
G. Identify various irrigation requirements and methods for container plants.
H. Identify and describe the cultural practices involved in container plant production.

Chapter 42. Field Production of Nursery Crops
A. Understand and describe the proper soil preparation for field production.
B. Identify and describe the cultural practices involved in field production of woody and perennial plants.
C. Explain the importance of field fertility, the process of soil sampling and the application of fertilizer.
D. Identify and explain the specific issues of field production relative to the type of plants harvested.
E. Describe terminal versus caliper growth and how they are affected by pruning and staking.
F. Identify and explain the proper pruning practices for field-grown nursery crops.

Chapter 43. Floricultural Production and Management
A. Explain the physiology of flower development in plants.
B. Describe the importance and management of Day length in the production of Floricultural crops.
C. Describe the types of greenhouse structures and their component parts.
D. Describe the cultural and management practices for the production of floricultural crops.
E. Identify plant growth regulators and explain the role and effect of various products used in Floricultural production.
Chapter 44. Landscaper Design
A. Explain sustainability and describe why it is important to landscape design.
B. Identify and describe the key landscape design objectives.
C. Explain and describe the base plan requirements and sequence for completion.
D. Identify and describe the principles and elements of design.

Chapter 45. Landscape Contracting
A. Identify and describe the major components required in landscape contracting.
B. Identify and describe potential problem areas of landscape contracting.
C. Identify and describe what is required in successful landscape bidding.

Chapter 46. Hardscape Construction
A. Explain the importance of local and state government building code requirements in Hardscape installation projects.
B. Describe the construction process for installing paver walkways, driveways, and patios.
C. Explain the angle of repose and engineering requirements for building retaining walls.
D. Explain the environmental advantages of using permeable pavers when installing sidewalks, patios, and driveways.
E. Identify and describe the general terminology involved in Hardscape Construction.

Chapter 47. Garden Center Management
A. Explain the importance of garden center management of people, products, and services.
B. Identify and explain internal and external customers.
C. Describe the importance of management policies and standards in the Garden Center.
D. Explain the need for implementing a “Production Mode” in the Garden Center.

Chapter 48. Marketing, Merchandising, and Sales
A. Identify and describe various consumer age marketing subcultures.
B. Explain the differences between cost and value, and why these are important.
C. Identify and describe the types of communications businesses use to obtain customers.
D. Explain and identify the goals of display selling and maintenance.
E. Identify and describe the guidelines used to establish customer traffic flow in the Garden Center.
F. Identify and describe successful types of Garden Center displays.
G. Identify and describe the components of true selling.
H. Identify and describe the personalities and qualities of successful sales people.
I. Identify and explain the various approaches to successful sales.
J. Explain the need for uniform laws and regulations in marketing container plants.
K. Describe the legal information and labeling required to market container plants.
L. Identify and explain the requirements for label variation for different types of labels.