

I		Soil Management
I	A	Soil
I	A 1	Soil formation and horizons
I	A 2	Urban soils
I	A 3	x x 1 Soil properties: Discuss how soil characteristics can affect root distribution.
I	A 3	x x 2 Soil properties: Explain the physical, chemical, and biological properties of soil.
I	A 4	Soil testing
I	A 5	Soil improvement: Recommend soil remediation treatments.
I	A 6	Structural soils: Understand structural soils and when they are appropriate.
I	B	Water
I	B 1	Properties
I	B 2	Management
I	C	Mineral nutrition
I	C 1	Plant requirements
I	C 2	Fertilizer: Fertilize trees according to applicable standards and best practices.
II		Tree Identification and Selection
II	A	Importance of proper tree identification: Identify trees to diagnose problems, recommend care, and perform tree work.
II	B	Nomenclature
II	B 1	Explain how scientific names are written.
II	B 2	Discuss some potential problems with using common names of trees.
II	C	Classification: Describe how trees and other plants are classified.
II	C 1	Basic knowledge of the classification system
II	C 2	Comprehension of similarities plants within levels of hierarchy
II	D 1	Tree Characteristics
II	D 1	Morphological characteristics: Recognize identification factors such as leaf arrangement and type, leaf shape and leaf margin, twig and bud characteristics, etc. to determine the identity of tree species.
II	D 2	Species characteristics: Utilize knowledge of tree characteristics, including advantages and limitations, to recommend care and management measures.
II	D 3	Tropical trees: Identify characteristics of tropical trees.
II	D 4	Utilize technology to identify plants.
II	E	Selection
II	E 1	Species selection: Utilize knowledge of tree characteristics, including advantages and limitations, to select species for planting sites.
II	E 2	Tree selection

III Installation and Establishment

III A x x x 1 Planting: Recognize signs and symptoms of planting mistakes.

III A x x x 2 Planting: Plant or transplant trees according to applicable standards and best practices.

III A 1 Site Evaluation: Select appropriate sites for tree planting to ensure long-term survival and service.

III A 2 Planting timing

III A 3 Preparing planting area

III A 4 Proper placement of tree

III A 5 Proper handling of planting stock

III A 6 Impact of soil amendments

III A 7 Backfilling and berming

III A 8 Transplanting

III B Post-planting care: Care for newly planted trees to ensure survival, growth, and good structure.

III B 1 Watering

III B 2 Mulching: Select and apply mulch according to best practices.

III B 3 Trunk wrap

III B 4 Support and protection systems: Install support for newly planted trees according to best practices, when appropriate.

III B 5 Pruning

III B 6 Fertilization

III B 7 Need for continued care

IV Safe Work Practices

IV A x x x 1 Standards, regulations, and laws: Perform tree work according to applicable safety standards and regulations.

IV A x x x 2 Standards, regulations, and laws: Explain which standards and regulations are applicable for the work that you do.

IV B General safety

IV B 1 Hazard recognition: Understand tree risk assessment for the climbing arborist.

IV B 2 Job briefing/work plan: Understand how to conduct a job briefing.

IV B 3 Site safety (traffic control, work zone, drop zone)

IV B 4 Materials (fuel, chemicals)

IV B 5 Ergonomics

IV B 6 Crew communication: Understand and implement a command and response communication system.

IV C Electrical hazards

IV C 1 Awareness: Describe the electrical hazards associated with working around electric wires.

IV C 2 Protocols: Maintain safe distances when working on trees near electric wires.

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IV	D	Equipment
IV	D 1	Chain saw safety: Safely operate a chain saw according to all applicable standards and best practices.
IV	D 2	Chippers, stump grinders: Safely operate a wood chipper according to all applicable standards and best practices.
IV	D 3	Aerial lifts/MEWP
IV	D 4	Other large equipment/vehicles: Utilize a crane as a tool.
IV	D 5	Tools, gear: Understand and follow manufacturing specifications for use and inspections on arboricultural equipment.
IV	E	PPE and personal climbing gear
IV	E 1	PPE (Head, eye, hearing, footwear, chain saw protection): Select appropriate personal protective equipment (PPE) for performing tree work.
IV	E 2	Climbing gear
IV	F	Climbing/working in trees: Climb trees to perform tree work using safe practices and efficient techniques.
IV	F 1	Entry and ascent
IV	F 2	Working in trees
IV	F 3	Descent
IV	F 4	Knots: Tie, dress, and set each of the knots most commonly used in tree work.
IV	G	Rigging
IV	G 1	Methods/techniques: Select safe and efficient techniques for rigging out tree branches.
IV	G 2	Principles (forces, systems): Discuss the forces involved in rigging operations.
IV	H	Removal (felling, limbing, bucking, etc.): Fell trees using appropriate techniques to ensure accuracy and safety as well as limbing and bucking.
IV	I	Emergency response: Describe the emergency response procedures that must be implemented if needed.
IV	I 1	Calling authorities
IV	I 2	First aid and CPR: Implement first aid procedures, if needed.
IV	I 3	Aerial rescue: Perform an aerial rescue from a tree or aerial lift device, if needed.
IV	J	Training/culture of safety
V		Tree Biology
V	A	Anatomy (structure): Utilize knowledge of tree anatomy to specify tree work
V	A 1	Gymnosperms, angiosperms: Identify the anatomical parts of a tree's trunk/stem, leaves, and roots.
V	A 2	Palms only: Describe how palms differ in anatomy from trees.
V	B	Physiology (functions)
V	B 1	Photosynthesis: Explain the process of photosynthesis.
V	B 2	Respiration
V	B 3	Transport: Explain how trees move water up from the roots to the leaves.
V	B 4	Storage

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V	C				Growth and development: Understand the aging process from juvenile to veteran.
V	C	1			Vegetative growth
V	C	2			Dormancy
V	C	3			Decline and senescence: Describe how trees die and the mortality spiral.
V	C	4			Environmental effects and response: Explain how fall color occurs.
V	C	5			Sexual reproduction
V	D				Biomechanics
V	D	1			CODIT: Describe the process of compartmentalization of decay.
V	D	2			Response growth
V	D	3			Mechanical stresses
V	D	4			Growth form and responses to loading: Explain how tree branches are attached.
VI Pruning					
VI	A				Principles
VI	A	1			Effects of pruning
VI	A	2			Timing
VI	A	3	x	x	1 Objectives: List acceptable objectives for pruning trees.
VI	A	3	x	x	2 Objectives: Select appropriate pruning types/methods to achieve the objectives.
VI	B				Practices/techniques
VI	B	1			Pruning systems/types
VI	B	2			Standards and best practices: Prune trees according to applicable standards and best practices.
VI	B	3			Writing specifications: Write pruning specifications.
VI	B	4			Proper cuts
VI	B	5			Root pruning: Understand and prescribe root pruning.
VI	B	6			Utility pruning
VI	B	7			Tools
VI	B	8			Improper pruning: Recognize signs and symptoms of poor pruning practices.
VI	B	9			Wound dressings: Understand when and where wound dressings are needed.
VII Diagnosis and Treatment					
VII	A	x	x	x	1 Plant health care: Implement plant health care management plans.
VII	A	x	x	x	2 Plant health care: Develop a plant health care management plan.
VII	A	1			PHC principles
VII	A	2			Stress factors:
VII	A	3	x	x	1 Compounding factors: Discuss how plant health problems sometime result from a combination of factors.
VII	A	3	x	x	2 Compounding factors: Determine differences between primary and secondary diseases.
VII	A	4			Predators, parasites, beneficials

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VII B	Diagnosis principles and practices: Diagnose common tree health problems.
VII B 1	Identification of the plant
VII B 2	Signs and symptoms: Recognize symptoms and signs of plant health problems.
VII B 3	Living vs. nonliving: Distinguish between plant problems caused by living organisms and non-living disorders.
VII B 4	Key/common pests: Identify common causes of tree health problems (pests, diseases, abiotic and biotic disorders).
VII B 5	Tools and methods
VII B 6	Use of laboratory
VII C	Insects, mites, nematodes, larger animals
VII C 1	Insects and mites
VII C 2	Vectors
VII C 3	Other animals
VII D	Diseases
VII D 1	General concepts
VII D 2	Fungi
VII D 3	Bacteria
VII D 4	Viruses, phytoplasmas, other
VII E	Abiotic disorders
VII E 1	Climate
VII E 2	Physiological
VII E 3	Mechanical
VII E 4	Chemical
VII E 5	Competition/allelopathy
VII F x x x 1	Treatment/management: Recommend treatments for various tree health disorders.
VII F x x x 2	Treatment/management: Execute/apply treatments for various tree health disorders.
VII F 1	Biological
VII F 2	Mechanical
VII F 3	Chemical: Recognize that there are pesticide and application regulations.
VII F 4	Other
VII G x x x 1	Invasives/emerging problems: Detect and monitor for the presence of important, non-native pests.
VII G x x x 2	Invasives/emerging problems: Recognize emerging trends of significant/epidemic insects and diseases.

VIII	Urban Forestry
	Benefits and costs of trees: Discuss the ecological, environmental, economic, social, health, and aesthetic benefits of trees.
VIII A	
VIII A 1	Sociological benefits
VIII A 2	Environmental benefits
VIII A 3	Costs
VIII B	Appraisal and valuation: Know how to appraise the monetary value of trees.
VIII B 1	Appraisal approaches
VIII B 2	Real estate value improvement
VIII B 3	Community tree benefits
VIII C	Regulatory and legal issues
	Ordinances and tree preservation orders: Understand and apply tree ordinances and tree preservation orders.
VIII C 1	
VIII C 2	Permits and licenses
VIII D	Management
	Tree management plan: Understand the importance of developing and implementing an urban forestry management plan.
VIII D 1	
VIII D 2	Risk management plan
	Wildlife protection: Be aware of fauna and the impact of arboricultural practices on fauna.
VIII D 3	
VIII D 4	Planting plan
VIII D 5	Pruning/maintenance cycle
VIII D 6	Diversity of species plan
VIII D 7	Inventory: Understand the importance of developing and maintaining a tree inventory.
VIII D 8	Invasive species management
	Information and education: Conduct public education activities about the need for proper tree practices.
VIII E	
VIII E 1	Communication/cooperation with related professionals
VIII E 2	Communication with the public
VIII E 3	Topics
VIII F	Professional ethics: Demonstrate and apply professional ethics in the practice of arboriculture.
VIII G	Best practices: Recognize and implement professional standards in tree care practice.
IX	Protection and Preservation
IX A	Protection: Implement tree protection plans during construction and site development.
IX A 1	Planning and tree/site evaluation: Knowledge to read and understand site plans.
IX A 2	Communication/cooperation with developers/contractors
	Tree protection measures: Recommend measures to protect trees from damage during construction.
IX A 3	
IX B	Damage: Describe how construction activities impact the health and stability of trees.
IX B 1	Roots
IX B 2	Trunk/branches
IX B 3	Whole tree

IX	C				Post-damage management: Recommend treatments for trees that have been damaged during construction	
IX	C	1			Managing risk	
IX	C	2			Improving health	
IX	C	3			Managing long-term impacts: Understand construction impacts on longevity of tree cover and necessity of replanting replacement trees.	
X					Tree Risk Management	
X	A				Roles and responsibilities	
X	A	1			Tree owner/manager	
X	A	2			Risk assessor	
X	A	3			Arborist	
X	B				Types of risk	
X	B	1			Failure	
X	B	2			Tripping	
X	B	3			Fruit/flowers	
X	B	4			Other	
X	C				Risk assessment: Assess tree risk using a valid, acceptable methodology.	
X	C	1	x	x	1	Levels of assessment: Determine which of the three levels of tree risk assessment is necessary under various circumstances.
X	C	1	x	x	2	Levels of assessment: Be aware of the three levels of tree risk assessment with only three years of arboricultural experience.
X	C	2				Pre-work inspection: Understand the importance of evaluating tree stability prior to working within the tree.
X	C	3				Establish time frame: Assess the timeframe for likelihood of failure.
X	C	4				Target analysis
X	C	5				Site analysis: Interpret site evaluation; soils; exposure
X	C	6				Tree analysis: Identify tree defects and conditions that could increase the likelihood of failure.
X	D					Risk analysis
X	D	1				Likelihood of failure
X	D	2				Likelihood of impact: Assess the likelihood of a tree or tree part failure to impact a target.
X	D	3				Consequences: Assess the potential consequences of tree failure.
X	E					Risk evaluation/comparison with owner tolerance
X	F					Prioritization of mitigation
X	G					Mitigation: Recommend measures to mitigate tree risk.
X	G	1				Tree-based measures
X	G	2				Target-based measures
X	H					Residual risk (remaining risk after mitigation): Assess residual risk after mitigation options have been implemented.
X	I					Inspection interval