ISA Certified Arborist ®
EXAMINATION OUTLINE

About the Program

ISA certification is a voluntary program that tests and certifies a professional's achievement of an industry-accepted standard level of knowledge and skill in the field of arboriculture. When a professional becomes an ISA Certified Arborist, they should be recognized by their peers and the public as a tree care professional who has attained a generally-accepted level of knowledge in core and broad areas of arboriculture field as identified through periodic job task analyses.

Domains

Domains are the major responsibilities or duties that characterize the practice of arboriculture. The weight or percentages denote the amount of the exam that is devoted to each domain.

- Tree Biology (11%)
- Tree Identification and Selection (9%)
- Soil Management (7%)
- Installation and Establishment (9%)
- Pruning (14%)
- Diagnosis and Treatment (9%)
- Trees and Construction (9%)
- Tree Risk (11%)
- Safe Work Practices (15%)
- Urban Forestry (6%)

Tree Biology   Weight: 11%

Task A: Specify and recommend tree work based on knowledge of tree anatomy, physiology, and biomechanics.

Knowledge of:

1. Root anatomy and functions
2. Trunk, branch, twig, and leaf anatomy and functions
3. Respiration, photosynthesis, and energy allocation and storage within the tree
4. Water movement within the tree (i.e., root uptake, transpiration, and water transport structures)
5. Tree identification, tree profiles (i.e., form, architecture), growth habits and stages, morphophysiology, and silhouettes
6. Compartmentalization of decay in trees (CODIT)
7. Mechanical stress and response growth

Skill in:

1. Identifying trees
2. Making management and maintenance recommendations based on tree developmental stage and structural and physiological needs

Task B: Explain a tree's life cycle and develop tree work recommendations based on tree growth and developmental needs.

Knowledge of:

1. Vegetative growth
2. Reproduction (i.e., sexual, asexual)
3. Propagation (e.g., softwood cuttings, layering, grafting)
4. Phenology (e.g., dormancy, flowering, bud break, senescence)
5. Tree death (e.g., dying process, mortality/decline spiral)
6. Environmental effects and responses (e.g., fall colors, halophytes, desert adaptations, pneumatophores)

Skill in:

1. Developing pruning and other maintenance recommendations based on life cycle and condition (i.e., pruning young versus mature and veteran trees)

Tree Identification and Selection   Weight: 9%

Task A: Describe the importance of proper tree identification in tree management.

Knowledge of:

1. The relationship between accurate tree identification, tree species characteristics and needs, and problem diagnosis

Skill in:

1. Using tree identification reference materials and tree identification systems

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Task B: Explain tree classification systems and utilize appropriate nomenclature during tree identification and communication.

Knowledge of:

1. General tree classification (e.g., angiosperms, gymnosperms, monocots, eudicots, deciduous, semi-deciduous, evergreens)

Skill in:

1. Using and notating plant scientific names (i.e., binomial nomenclature) in report writing and communication

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Task C: Describe important morphological and physical structures used to identify tree species.

Knowledge of:

1. Root, trunk, and branch anatomy
2. Twig anatomy (e.g., buds, nodes, internodes, leaf scars, lenticels)
3. Leaf anatomy (e.g., blade, midrib, petiole)
4. Leaf types, characteristics, and arrangements (e.g., leaf type and arrangement on branches/stems, apices, margins, bases, leaflet arrangement on compound leaves)
5. Flower and inflorescence types
6. Fruits, seeds, and seedpods
7. Tree profiles (i.e., form, architecture), growth habits, and silhouettes
8. Characteristics of tropical and desert trees (e.g., anatomical, morphological, and physiological adaptations)

Skill in:

1. Recognizing notable features in key anatomical structures (e.g., roots, trunk, bark, leaves, buds, flowers, fruit) associated with tree classification
2. Collecting tree samples that aid in tree identification
3. Utilizing available tree identification tools and resources (e.g., dichotomous keys, field guides, software, apps, expert advice)

Task D: Select tree(s) appropriate for a given planting site and project needs taking into consideration short- and long-term tree requirements and maintenance goals.

Knowledge of:

1. Characteristics of tree species (e.g., cultural needs, size, growth pattern and rate, flower and fruiting, wildlife use, air quality and sustainability, maintenance needs, benefit-cost ratio, invasiveness)
2. Species-specific considerations and potential vulnerabilities (i.e., biotic factors, abiotic factors, site characteristics)

Skill in:

1. Collecting soil samples
2. Analyzing soil characteristics (e.g., soil texture, drainage, available rooting space)
3. Assessing site characteristics (e.g., sun and wind exposure, water availability and drainage, soil-available space)
4. Selecting a tree species that will thrive at the planting site
5. Recommending tree species for the planting site to other parties (e.g., project managers, customers, engineers, general public)
6. Communicating tree requirements and site considerations to other parties (e.g., project managers, customers, engineers, general public).
7. Making recommendations based on tree requirements and site considerations to other parties (e.g., project managers, customers, engineers, general public).

Soil Management   Weight: 7%

Task A: Assess soil's physical, chemical, and biological components and its relationship in supporting the tree development and growth.

Knowledge of:

1. Industry-accepted standards related to soil management (e.g., ANSI A300 Soil Management – Part 2 accompanying ISA Best Management Practices)
2. Soil formation and horizons
3. Physical characteristics of soil (e.g., texture, structure, bulk density)
4. Chemical characteristics of soil (e.g., pH, buffering capacity, cation exchange capacity)
5. Biological components of soil (e.g., mycorrhizae, rhizosphere, macroinvertebrates, organic matter)
6. Urban soils (i.e., types of disturbances and degradation of soils found in urban landscapes)
7. Methods for sampling soil
8. Relationship between soil and root distribution

Skill in:

1. Collecting soil samples
2. Interpreting soil test results
3. Analyzing soil characteristics (e.g., determining soil texture, drainage)

Task B: Explain the interaction between water and soil and how it affects tree growth and development, assess site conditions, and list management options when needed.

Knowledge of:

1. Water movement and drainage (e.g., surface, underground, storm water)
2. Soil structure and water behavior in soil
3. Relationship between drainage, available water and soil characteristics
4. Water budgets (i.e., rate of change of water stored in an area or soil surrounding trees and balanced by the quantity and rate at which water flows in and out of the same area)
5. Supplemental water, irrigation and water harvesting systems (e.g., application, scheduling, recycled water)
6. Local climatic condition affecting availability and uptake of water from soil (e.g., humidity, temperature, average rainfall)

Skill in:

1. Assessing drainage and water-holding capacity
2. Recommending methods for effective water management for trees

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Task C: Identify trees' soil volume, structure, and nutrition requirements and recommend mitigation strategies when needed.

Knowledge of:

1. Tree nutritional and uptake requirements (i.e., macro- and micronutrient requirements)
2. Soil management and amendments (e.g., mulching, soil amendments)
3. Soil volume and structure requirements for trees
4. Types of fertilizer (e.g., natural/synthetic, liquid/dry, soluble/controlled release) and soil nutrition strategies
5. Fertilization application strategies, timing, and techniques (e.g., surface, subsurface, foliar, injection)

Skill in:

1. Recommending soil management and development strategies to support tree growth and development in urban spaces (e.g., root paths, soil trenches, soil vaults, structural soils, structural cells)
2. Identifying soil improvement and remediation strategies (e.g., mulching, aeration, vertical mulching, pH remediation, soil replacement and amendments, biochar)
3. Recommending and applying fertilizer on a needs basis and according to applicable, industry-accepted standards and best practices

Installation and Establishment   Weight: 9%

Task A: Plant and transplant trees according to industry-accepted standards and best practices.

Knowledge of:

1. Industry-accepted planting and transplanting standards (e.g., BSI/BS 8545 Trees – From nursery to independence in the landscape; ANSI A300 Transplanting Standard – Part 6; ISA Best Management Practices – Tree Planting; Z60.1 American Nursery Stock Standard; BSI/BS 3936-1 Nursery stock – Part 1: Specification for trees and shrubs; CSLA Canadian Landscape Standard)
2. How trees are propagated and grown by the nursery industry
3. Planting timing (e.g., season, stock type, water availability, temperature, sunlight availability)
4. Proper placement of the tree
5. Impact of soil amendments
6. Backfilling
7. Root ball interaction with planting hole and soil (e.g., impact of soil amendments, soil settlement, potential for root burn, desiccation, or drainage issues)
8. Advantages and disadvantages of different types of nursery stock

Skill in:

1. Assessing the quality and health of planting stock
2. Inspecting the root system of the planting stock before purchasing
3. Handling of planting stock
4. Selecting appropriate sites for tree planting to ensure long-term survival and service
5. Preparing the planting site (e.g., determining planting hole width and depth)
6. Pruning roots and shaving rootballs to prevent girdling and/or circling roots
7. Planting a tree according to industry-accepted standards and best practices
8. Removing rootball package materials (e.g., wire baskets, burlap and twine/straps, wood crates, plastic containers)
9. Backfilling and adding a soil and/or mulch berm to support tree establishment
10. Transplanting trees (e.g., transport, site choice and preparation, viability, post-planting care)

Task B: Provide care for newly planted trees to ensure survival, growth, and good structure.

Knowledge of:

1. Characteristics of tree species (e.g., pest susceptibility, growth patterns, mature form)
2. Cultural and environmental requirements associated with different tree species (e.g., sun and heat exposure; soil type, water, and drainage needs; available root space; pest susceptibility; nutrition)
3. Trunk wrap and support systems

Skill in:

1. Determining watering requirements for establishment
2. Selecting and applying mulch
3. Installing support for newly planted trees when needed
4. Pruning young trees for good structure
5. Pruning and making pruning recommendations (i.e., developing a pruning plan)
6. Recommending and/or discussing a plant health care plan
7. Recognizing inappropriate planting techniques
8. Including and engaging local stakeholders to ensure plant survival and long-term maintenance (e.g., local communities, residents, students, NGOs)

Pruning   Weight: 14%

Task A: Explain why pruning is undertaken and list the main industry-accepted pruning systems, objectives, types of cuts, and general practices.

Knowledge of:

1. Accepted industry standards for tree pruning (e.g., ANSI A300 Pruning Standard - Part 1 and accompanying ISA Best Management Practices, BSI/BS 3998 Tree Work - Recommendations)
2. Pruning practices and considerations associated with optimal timing and quantity depending on species type, condition, and environmental factors
3. Outcomes of tree pruning (e.g., benefits, consequences, cost, flowering, fruiting)
4. Wound response
5. Pruning objectives (e.g., structural development, risk mitigation, clearance, density reduction, restoration, size management)

Skill in:

1. Assessing tree and site conditions that influence pruning decisions and short- versus long-term outcomes
2. Communicating how pruning trees promotes good structure (e.g., reduce the likelihood of failure) while minimizing the impact on tree health to a lay audience
3. Explaining the difference between unacceptable and acceptable pruning techniques to a lay audience

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Task B: List commonly used industry-accepted pruning tools and their use.

Knowledge of:

1. Scissor-type pruning tools (e.g., pruning shears, loppers, shears, pole pruners)
2. Pruning saws (i.e., hand saw, pole saw)
3. Chainsaws

Skill in:

1. Cleaning and maintaining pruning tools
2. Selecting the appropriate pruning tool for a given scenario
3. Handling pruning tools according to industry-accepted practices

Task C: Recommend and execute tree pruning in a manner which minimizes the impact on tree health and promotes longevity and recognize signs and symptoms of improper pruning practices.

Knowledge of:

1. Anatomy and physiology of tree parts, branches, and branch unions/structures (e.g., branch collar, branch bark ridge, codominant stems, branch weight)
2. Compartmentalization of decay in trees (CODIT)
3. Pruning systems (e.g., natural, pollarding, espalier, for fruit production and harvesting)
4. Improper pruning techniques (e.g., topping or stub cuts, lion-tailing and excessive thinning)
5. Root pruning
6. Utility pruning
7. Types of pruning cuts (e.g., branch removal cut, reduction cut, heading cut, shearing cut)
8. Industry-accepted safety standards and requirements (e.g., ANSI Z133 Safety Requirements for Arboricultural Operations, local requirements)
9. ISO 11681-2:2011/AMD 1:2017 (Machinery for forestry — Portable chain-saw safety requirements and testing — Part 2: Chain-saws for tree service — Amendment 1)
10. Industry-accepted safety standards and requirements regarding working near electrical systems (e.g., ANSI Z133 Safety Requirements for Arboricultural Operations, local requirements)
11. Disinfection of tools (e.g., use of alcohol-based disinfecting solutions)

Skill in:

1. Writing pruning objectives and specifications
2. Performing pruning cuts (e.g., branch removal cut, reduction cut, heading cut, shearing cut)
3. Determining where the pruning cut should be located according to branch union anatomy and industry-accepted best management practices
4. Predicting tree response to pruning cuts depending on tree species, age, wound size, timing, and overall tree health
5. Sequencing cuts to facilitate ease of handling removed material and to minimize the potential for bark tearing beyond the point of branch attachment

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Task D: Explain pruning practices that are detrimental to tree health and longevity.

Knowledge of:

1. Harmful pruning practices (i.e., topping, over-thinning, lion-tailing, flush cutting)
2. Consequences of improper cuts on tree health and structure

Skill in:

1. Anticipating potential impacts of detrimental pruning practices to tree health and structure
2. Explaining why certain pruning strategies, cuts, and wound dressings may be detrimental to tree health and longevity

Diagnosis and Treatment   Weight: 9%

Task A: Explain and implement diagnostic principles and practices.

Knowledge of:

1. Tree identification
2. Difference between signs and symptoms
3. Difference between biotic and abiotic disorders
4. Key/common biotic stresses and disorders (e.g., insects, mites, nematodes, vectors, other animals, diseases)
5. Key/common abiotic stresses and disorders (e.g., extreme weather and climate, compaction, limited rooting space, nutrient deficiency, improper planting, mechanical damage, chemical damage, competition)
6. Diseases (e.g., disease cycle, fungi infections, bacterial diseases, and vectors)

Skill in:

1. Identifying emerging regional problems and trends in plant pests and disease recognition and monitoring
2. Identifying common causes of tree health problems (e.g., pests, diseases, and abiotic disorders)

Task B: Explain plant health care (PHC) and integrated pest management (IPM) principles.

Knowledge of:

1. PHC principles (e.g., prevention, early detection, treatment)
2. IPM principles (e.g., action thresholds, monitoring, pest control tactics, documentation and record keeping)
3. Stress factors (e.g., compaction, excessive pruning, improper planting)
4. Compounding factors (e.g., combination of factors, primary versus secondary pests and diseases)

Task C: Develop and implement a plant health care (PHC) management plan that takes integrated pest management (IPM) into consideration and a holistic view of the client, landscape, and environmental needs.

Knowledge of:

1. PHC principles (e.g., prevention, early detection, treatment)
2. IPM principles (e.g., action thresholds, monitoring, pest control tactics, documentation and record keeping)
3. Industry and regional standards and laws associated with chemical control use, storage, proper waste management, and application
4. Tree identification
5. Tree diagnostics and treatment

Skill in:

1. Developing a PHC management plan
2. Implementing a PHC management plan
3. Communicating findings and associated management plan and recommendations to key stakeholders (e.g., project managers, tree owners)
4. Monitoring pest resurgence, treatment success, and follow-up care

Trees and Construction   Weight: 9%

Task A: Develop and implement tree protection plans for individual trees or population of trees on or near construction, development, or demolition sites.

Knowledge of:

1. Accepted industry standards related to trees and construction (e.g., ANSI A300 Construction Management Standard – Part 5 and accompanying ISA Best Management Practices, BSI/BS 5837 – Trees in Relation to Design, Demolition and Construction)
2. Site plans
3. Construction phases (i.e., planning, design, pre-construction, construction, post- construction)
4. Tree Protection Zone (TPZ)
5. Critical Root Zone (CRZ)
6. Species-specific resilience/vulnerability to construction
7. Methods for soil and root protection
8. Roles of developers and contractors within a tree protection plan
9. Tree protection measures (e.g., trunk/canopy protection, limiting ingress/egress, fences and signage)

Skill in:

1. Interpreting a site plan
2. Utilizing the site plan to aid in implementing the tree protection plan
3. Recommending measures to protect trees from damage before and during construction
4. Coordinating tree protection activities with developers/contractors
5. Assessing the effectiveness of tree protection plans

Task B: Predict the impact of construction activities on tree health and stability.

Knowledge of:

1. Construction practices and techniques
2. Construction activity's impact on tree root systems (e.g., soil compaction, root severing, drainage changes and water stress, chemical pollution)
3. Construction activity's impact on tree trunk and branches (e.g., wounding, scald, mechanical damage)
4. Construction activity's impact on tree health and stability (e.g., destabilization, secondary pests/infection, cultural and environmental changes)

Task C: Recommend treatments for trees that have been impacted during construction.

Knowledge of:

1. Short- and long-term impact of construction to the longevity of a tree
2. Conditions when tree removal and replacement is necessary

Skill in:

1. Assessing risk related to construction injury to the tree
2. Developing a treatment and mitigation plan
3. Providing care to the tree to promote recovery (e.g., mulching, watering, soil/drainage remediation, pest/disease management)
4. Recommending short- and long-term treatments to promote recovery

Tree Risk   Weight: 11%

Task A: Identify and communicate the roles and responsibilities of different parties involved in tree risk management.

Knowledge of:

1. Roles and responsibilities of the tree owner/manager
2. Roles and responsibilities of the risk assessor
3. Roles and responsibilities of the arborist

Skill in:

1. Communicating risk and risk management with audiences of diverse gender, gender identity, ethnicity, race, educational background, level of knowledge of arboriculture, positions, and interests

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Task B: List the types of risk associated with trees.

Knowledge of:

1. Whole tree versus tree part failure
2. Tripping, slipping
3. Branch/leaf/fruit/flowers and associated risks
4. Other potential sources of risk (e.g., damage to structures and property, impaired visibility associated with traffic signage and security, power lines, air quality and allergens, poisoning, wildlife)

Task C: Perform a limited visual tree risk assessment of an individual tree or a population of trees near specified targets.

Knowledge of:

1. Levels of assessment (i.e., Limited visual, Basic, Advanced)
2. Target analysis
3. Site analysis (e.g., interpret site evaluation, soils, exposure)
4. Tree analysis (e.g., identify tree defects and conditions that could increase the likelihood of failure)
5. Tree-based measures for mitigating tree risk (e.g., pruning, structural support systems)
6. Target-based measures for mitigating tree risk (e.g., relocation, restrict access)
7. Tree stability
8. Tree risk mitigation measures

Skill in:

1. Determining which level of tree risk assessment is necessary under various circumstances
2. Identifying obvious tree defects and conditions that could increase the likelihood of failure
3. Recommending measure to mitigate tree risk
4. Determining the inspection interval

Safe Work Practices   Weight: 15%

Task A: Explain and comply with industry accepted safety standards, local laws, directives, and regulations for performing tree work and ensuring the safety of climbers, workers, and other persons near the work zone.

Knowledge of:

1. Industry-accepted safety standards and requirements (e.g., ANSI Z133 Safety Requirements for Arboricultural Operations, BSI/BS3998 Tree work - Recommendations)
2. ISO 11681-2:2011/AMD 1:2017 (Machinery for forestry — Portable chain-saw safety requirements and testing — Part 2: Chain-saws for tree service — Amendment 1)
3. Industry-accepted safety standards and requirements regarding working near electrical systems (e.g., ANSI Z133 Safety Requirements for Arboricultural Operations)
4. Fire safety (i.e., safe use of gas-powered and electric tools)
5. Work-zone security, work planning, and communication best practices

Skill in:

1. Referring to relevant laws and regulations from all levels of government
2. Accessing and maintaining reference materials

Task B: Develop safety protocols to mitigate risk present within the tree of interest, work site, or equipment being used.

Knowledge of:

1. Signs and symptoms of trunk and/or root decay (e.g., crown dieback, fungal fruiting bodies, sloughing bark, termites, boring insects, carpenter ants)
2. Mechanical or physical damage done to a tree and/or root system (e.g., trenching, broken tree parts, trunk damage, soil heaving)
3. Species-related patterns of whole tree or tree part failure
4. Local insects, animals, and plants that are potential hazards to workers (e.g., arboreal mammals, bees, ticks and Lyme disease, mosquitoes and dengue fever, snakes and other reptiles, poison ivy, poison oak)
5. Visual tree inspection
6. Common structural/mechanical defects in trees
7. Ergonomics
8. Fire safety (i.e., safe use of gas-powered and electric tools)
9. Command and response communication system

Skill in:

1. Reviewing documentation regarding the work, creating a safe work plan, job briefing
2. Visually identifying obvious tree defects and conditions that could impact trees structural integrity and stability
3. Assessing tree structure (i.e., shape, lean, cracks, splits, excessive weight)
4. Visually inspecting the area immediately surrounding the tree
5. Determining if the tree can withstand the forces to be applied during the work
6. Managing traffic hazards
7. Preparing the work zone
8. Communicating hazards identified and seeking alternative measures and/or next steps with pertinent stakeholders
9. Developing and communicating a job briefing
10. Securing hazardous materials (e.g., fuel, chemicals) when not in use

Task C: Comply with safety standards when working near electrical hazards.

Knowledge of:

1. Common electrical systems and other services structures and hardware (e.g., pole/line hardware)
2. Basic properties of electricity (e.g., voltage, conductance)
3. Sources of electrical shock (i.e., direct and indirect contact)
4. Minimum approach distances

Skill in:

1. Identifying what stage of electrical distribution is being carried by the line (e.g., transmission, primary distribution, secondary distribution)
2. Identifying electrical hardware and line features (e.g., bare wires, insulated wires)
3. Maintaining minimum approach distances and wearing industry-accepted personal protection equipment (e.g., hydro gloves, flame-resistant clothing)

Task D: Utilize tools and equipment to safely conduct tree work.

Knowledge of:

1. Scissor-type tools (e.g., pruning shears, loppers, shears, pole pruners)
2. Pruning saws (i.e., hand saw, pole saw)
3. Chainsaws and applicable safety standards and best practices (e.g., ISO 11681- 2:2011/AMD 1:2017)
4. Chippers and stump grinders
5. Aerial lifts (i.e., Mobile Elevating Work Platform [MEWP])
6. Large equipment/vehicle applications (e.g., crane)

Skill in:

1. Inspecting tools and equipment for suitability prior to usage
2. Recognizing operational flaws
3. Selecting the appropriate hand or mechanical tools to perform arboricultural work
4. Using hand and mechanical tools in accordance with manufacturing specifications
5. Coordinating arboriculture work with large equipment/vehicle operators

Task E: Utilize appropriate personal protective equipment (PPE) to protect the health and safety of the arborist.

Knowledge of:

1. Head protection systems (e.g., climbing helmets, hardhats)
2. Eye protection systems (e.g., protective glasses, goggles, face shields)
3. Hearing protection (e.g., earplugs, earmuffs)
4. Leg protection (e.g., chainsaw protective chaps, chainsaw protective pants)
5. Foot protection (e.g., working boots, adequate ankle support)
6. Hand protection (e.g., cut resistant, flame resistant, and anti-vibration gloves)
7. Industry-accepted tree climbing saddle/harness, connecting links, work positioning lanyard friction management devices, and spurs/gaffs
8. Other PPE according to local regulations

Skill in:

1. Selecting appropriate PPE
2. Inspecting PPE for usage
3. Wearing and adjusting PPE
4. Maintaining PPE
5. Selecting tree climbing equipment that is appropriate for specifications of the project and meets regulations and industry-accepted standards for tree climbing

Task F: Explain critical climbing tasks necessary to perform tree work safely.

Knowledge of:

1. Climbing ropes and rope systems used in arboriculture
2. Knots or rope tools which provide safe entry and activity in the tree
3. Climbing techniques used for tie in and ascent
4. Procedures for a safe and controlled ascent, descent, and tree work while aloft

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Task G: Explain methods and techniques for tree rigging used in arboriculture.

Knowledge of:

1. Tree rigging hardware (e.g., lowering devices, blocks, pulleys, double sheave pulleys)
2. Tree rigging systems and techniques (e.g., tag line, butt tie/tip tie)
3. Tree characteristics and strength in relation to anchor point and anticipated forces in use during rigging

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Task H: Remove trees using appropriate techniques to ensure accuracy and safety as well as processing the tree parts.

Knowledge of:

1. Techniques for felling (e.g., assisted fell)
2. Techniques for aerial dismantlement (e.g., free fall, cut and fall)
3. Chainsaw safety features
4. Cutting techniques (e.g., directional notch, spear cut, drop cut, snap cut)
5. Tree removal safety hazards (e.g., barber chair, loss of directional control, lean, wind, power lines)
6. Work positioning techniques to reduce repetitive strain injuries and minimize exposure to chainsaw kickback

Skill in:

1. Developing a felling strategy considering terrain, built structures, lean, wind, natural direction of fall, targets, and direction of safe drop zone to aid the workflow
2. Developing a felling escape route strategy
3. Selecting and recommending appropriate tools to achieve directional control (e.g., tagline, rigging rope and mechanical advantage, falling wedges)
4. Work positioning to maximize comfort and control and minimize exposure to kickback while handling a chainsaw

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Task I: Aid in providing care or oversight during emergency situations involving physical harm or hazardous conditions that pose a safety risk to the arborist, other workers, and other persons near the work zone.

Knowledge of:

1. Emergency action plan
2. First aid
3. CPR
4. Aerial rescue

Skill in:

1. Assessing environmental hazards
2. Securing the emergency site/scene
3. Communicating with emergency responders during an emergency
4. Documenting and communicating with stakeholders after the emergency

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Task J: Promote the importance of safety and training of safety procedures and behaviors.

Knowledge of:

1. Safety procedures
2. Relevant guidelines and standards for arboriculture work
3. Importance of safety training (e.g., injury prevention, emergency preparedness, productivity)

Skill in:

1. Communicating the benefits of safety training and procedures to coworkers, leadership, and other stakeholders

Urban Forestry   Weight: 6%

Task A: Discuss the ecological, environmental, economic, social, health, and aesthetic benefits of urban forests and trees.

Knowledge of:

1. Environmental benefits of trees (e.g., air quality, storm water retention, wildlife habitat)
2. Economic benefits of trees (e.g., property value, return on investment)
3. Sociological benefits of trees (e.g., recreation, quality of life, crime reduction)
4. Health benefits of trees
5. Aesthetic benefits of trees
6. Benefit-cost ratio (BCR) and return on investment (ROI) associated with trees (e.g., benefits, maintenance and removal, risk management)

Skill in:

1. Discussing benefits, tradeoffs and investment associated with trees with different stakeholders (e.g., general public, tree owners, public servants, engineers)
2. Recording appropriate tree attributes for calculating tree value
3. Using established tree value calculators to determine the value of tree

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Task B: Explain accepted plant appraisal principles and approaches.

Knowledge of:

1. Appraisal approaches
2. Real estate value improvement
3. Community tree benefits

Task C: List possible regulatory ordinances and laws concerning trees.

Knowledge of:

1. Ordinances and tree preservation orders (e.g., tree protection orders, by-laws, tree acts, tree protection law)
2. Regional permitting and licensing procedures
3. Regional laws concerning wildlife management and habitat protection
4. Potential local laws and regulations (e.g., tree ordinances, wildlife protection ordinances, property and zoning laws)

Skill in:

1. Referring to relevant laws and regulations from all levels of government
2. Accessing and maintaining reference materials

Task D: Explain the importance and benefits of developing and implementing an urban forestry management plan.

Knowledge of:

1. Tree inventories
2. Planting plans, initiatives, and canopy cover goals
3. Sustainable initiatives (e.g., air quality improvement, waste reduction and recycling, emissions reduction, wildlife and habitat protection)
4. Pruning/maintenance cycle
5. Diversity of species management and planning
6. Invasive species management
7. Pests and diseases management

Skill in:

1. Collecting tree data onsite (e.g., diameter, height, condition)

Task E: Inform the public and various stakeholders regarding proper tree care and management practices.

Knowledge of:

1. Industry-accepted tree care and maintenance practices for trees in an urban environment (e.g., planting, transplanting, pruning, plant health care, risk assessment, removal)

Skill in:

1. Communicating with audiences of diverse gender, gender identity, ethnicity, race, educational background, level of knowledge of arboriculture, positions, and interests