

Course title	Urban Forestry				
Course code	GALA3605				
Course type	Lectures and practical application				
Level	Higher Diploma				
Year / Semester	3 rd Year / 6 th Semester				
Teacher's name	Antonia Stelikou				
ECTS	6	Lectures / week	2	Laboratories / week	1
Course purpose and objectives	The course in Urban Forestry focuses on the fundamental principles of tree maintenance in urban environments. Its goal is to introduce students to the theory and practice of managing trees in urban and peri-urban settings.				
Learning outcomes	<p>Upon completing the course, students are expected to:</p> <p>Theoretical Learning outcomes:</p> <ol style="list-style-type: none"> Explain the role and importance of trees in urban environments. Recognise the value of maintaining trees in parks and gardens. Describe methods for preserving and enhancing biodiversity in urban areas. <p>Practical Learning Outcomes:</p> <ol style="list-style-type: none"> Maintain and manage trees in urban and peri-urban environments. Apply arboricultural technologies and techniques for tree care in urban areas. Solve problems related to the maintenance and management of trees in urban and peri-urban settings. 				
Prerequisites		Required			
Course content	<p>Week 1: Introduction to Urban Forestry- Lectures</p> <ul style="list-style-type: none"> Role of trees in urban planning and sustainability Definition and scope of urban forestry Introduction to urban forest ecosystems <p>Practical: <i>Urban Tree Walk</i></p> <ul style="list-style-type: none"> Guided walk around campus/city block/park. 				

- Students identify tree species, note their placement (street, courtyard, park), and record observed ecosystem services (shade, noise reduction, aesthetics).

Week 2: Urban Green Infrastructure & Tree Integration- Lectures

- Green corridors, urban forests, and microforests
- Application of the **Miyawaki method** in compact spaces
- Urban planning integration of trees and shrubs

Practical: *Green Corridor Mapping*

- Students sketch or digitally map a local street/area.
- Mark where green corridors or microforests could be created.
- Apply Miyawaki method in a **design exercise**: suggest native species suitable for compact spaces.

Week 3: Tree Inventory and Spatial Analysis- Lectures

- Creating and maintaining detailed tree inventories
- GIS mapping and spatial data in urban forestry
- Site analysis for public green areas

Practical: Tree Inventory & Basic GIS/Mapping

- Students collect data for 10–15 trees: species, DBH (diameter at breast height), canopy spread, health.
- Enter data into spreadsheet or simple GIS tool (e.g., QGIS, Google Earth Pro).
- Produce a basic tree map of the study area.

Week 4: Tree Selection and Placement in Urban Settings- Lectures

- Criteria for selecting species for urban environments (pollution tolerance, root structure)
- Planting techniques considering hardscape limitations
- Case studies from Mediterranean and semi-arid cities

Practical: *Species Selection Workshop*

- Given a scenario (e.g., narrow street, schoolyard, polluted roadside), students select species based on tolerance traits.
- Role-play case study: Mediterranean/semi-arid city — which tree works best and why?
- Present choices in small groups.

Week 5: Construction, Installation & Infrastructure Interaction- Lectures

- Designing tree pits and tree-friendly pavements
- Managing utility conflicts (power lines, sidewalks, pipes)

Practical: *Tree Pit & Pavement Design Task*

- Using diagrams or site photos, students design an urban tree pit with proper soil volume, drainage, and root space.
- Suggest modifications for sidewalks/pavements to prevent root conflict.
- Compare “good” vs. “bad” real-world examples (photos provided).

Week 6: Tree Health in Urban Environments- Lectures

- Urban stressors: compaction, pollution, limited soil volume
- Integrated Pest Management (IPM) adapted to urban areas
- Preventive health care and long-term monitoring

Week 7: Practical: *Tree Health Diagnostics*

- Practice using a checklist for common urban stressors (soil compaction test, leaf discoloration, pest inspection).
- Students inspect assigned trees on site and rate their health/vitality.
- Data recording and reporting protocols
- Suggest preventive care suggestions.

Week 8: Climate Change & Urban Trees- Lectures

- Mitigating heat islands and flood control with green infrastructure
- Tree species adaptation to urban climate extremes
- Strategies for resilience and retrofitting existing green spaces

Practical: *Heat Island Observation*

- Measure ground/air temperature in shaded vs. unshaded urban areas (infrared thermometer or smartphone sensor).
- Compare differences and discuss implications for tree planting.

Week 9: Urban Forestry Policy and Legal Framework- Lectures

- Forest and urban green space regulations
- Urban tree bylaws, heritage trees, and public-private boundaries
- Role of municipalities and green permits

Week 10: Practical – Urban Planting Design & Maintenance Plan

- Develop and present a **small-scale planting plan**
- Design maintenance schedule based on site constraints

- Community space revitalization ideas

Week 11: Socio-Cultural and Public Health Role of Urban Trees- Lectures

- Green equity and social inclusion
- Urban trees and mental well-being
- Community forestry and public engagement

Week 12: Innovation and Future Trends- Lectures

- Smart tree monitoring (IoT, sensors, drones)
- Bioengineering, vertical forestry, and green facades
- Sustainability indicators and future prospects in urban forestry

Practical: Smart Tree Demo & Innovation Pitch

- Explore case studies/videos of IoT sensors, drones, or vertical forests.
- Students propose one **future innovation** for their city (e.g., smart irrigation, drone tree monitoring, sensor-based health checks).
- Present as a short pitch.

Course Breakdown

Week	Teaching Content	Teaching Process
Week 1	Introduction to urban forestry: definition, scope, role in sustainability, and overview of urban forest ecosystems. Practical: <i>Urban Tree Walk</i>	Theory (Lecture) + Practical
Week 2	Urban green infrastructure: green corridors, Miyawaki method, integration of trees in urban planning. Practical: <i>Green Corridor Mapping</i>	Theory (Lecture) + Practical
Week 3	Tree inventory and spatial analysis: GIS mapping, spatial data use, and site analysis for public greenspaces. Practical: Tree Inventory & Basic GIS/Mapping	Theory (Lecture) + Practical
Week 4	Tree species selection and placement: pollution tolerance, planting in constrained spaces, Mediterranean case studies. Practical: <i>Species Selection Workshop</i>	Theory (Lecture) + Practical

	Week 5	Construction & infrastructure: designing tree pits, managing utility conflicts in urban settings. Practical: <i>Tree Pit & Pavement Design Task</i>	Theory (Lecture) + Practical
	Week 6	Tree health management: urban stressors, Integrated Pest Management (IPM), and preventive care strategies.	Theory (Lecture)
	Week 7	Urban tree condition assessment using tools, evaluating tree vitality, risk, and pruning, including proper data recording and reporting.	Practical (Field)
	Week 8	Urban forestry and climate change: urban heat islands, resilient species, and adaptation strategies. Practical: <i>Heat Island Observation</i>	Theory (Lecture) + Practical
	Week 9	Legal and policy framework: urban forestry regulations, bylaws, heritage tree protection, and municipal responsibilities.	Theory (Lecture)
	Week 10	Development of small-scale urban planting and maintenance plan, with emphasis on design challenges and community engagement.	Practical (Field)
	Week 11	Socio-cultural & health benefits: urban trees and mental well-being, green equity, community forestry, and inclusive planning.	Theory (Lecture)
	Week 12	Innovation and future trends: smart monitoring technologies, vertical forests, bioengineering, and sustainability indicators. Practical: Smart Tree Demo & Innovation Pitch	Theory (Lecture) + Practical
Teaching methodology	<p>Theoretical Instruction The theoretical component is delivered through structured lectures that explore the ecological, technical, legal, and social dimensions of urban forestry. Students are introduced to concepts such as green infrastructure planning, tree species selection, urban environmental stressors, climate adaptation, and smart urban forestry technologies. Real-world case studies, legislative frameworks, and sustainability strategies are used to contextualize learning and promote critical thinking in urban greening practices.</p> <p>Practical Instruction The practical instruction focuses on applying theoretical knowledge through field-based and studio activities. Students participate in urban tree assessments, species identification, risk evaluations, and maintenance planning. Additional practical sessions involve the creation</p>		

	of small-scale planting designs, data recording, and the proposal of community-based greening strategies. These exercises enhance technical skills and support experiential learning in realistic urban settings.						
Bibliography	<p>Greek Bibliography</p> <ul style="list-style-type: none"> Ανανιάδου-Τζημπούλου, Μαρία (2018), Αρχιτεκτονική αστικού τοπίου: Αρχιτεκτονική τοπίου. Σχεδιασμός αστικών χώρων: Κριτική και θεωρία: Σύγχρονες τάσεις σχεδιασμού τοπίου, Ζήτη, ISBN 978- 960-456-501-6. Καϊλίδης, Δημήτριος Σ. (2005), Ασθένειες των δέντρων, δασών και πάρκων, 1η έκδ., Θεσσαλονίκη, Χριστοδουλίδη, ISBN 960-8183-51-0 <p>English Bibliography</p> <ul style="list-style-type: none"> International Society of Arboriculture (2010). Arboriculture : A magazine of the international society of arboriculture (Classic Reprint Series). Forgotten Books. ISBN: 9781451004816 Bryan G. Bowes (2010). Trees & Forests, A Colour Guide : Biology, Pathology, Propagation, Silviculture, Surgery, Biomes, Ecology, and Conservation. London : CRC Press. 2010. EBSCOHost 						
Assessment	<table border="0"> <tr> <td>• Attendance and course participation:</td> <td>10%</td> </tr> <tr> <td>• Individual reports relating to practical aspects</td> <td>40%</td> </tr> <tr> <td>• Final written examination</td> <td>50%</td> </tr> </table> <p>Student performance in this course will be evaluated through a combination of continuous and summative assessments. Attendance and active participation in class will contribute 10% to the final grade, reflecting the importance of consistent engagement. A portfolio of individual lab/practical reports compiled from the various practical sessions will account for 40%, assessing students' ability to document their work systematically, demonstrate applied skills, and reflect on their learning throughout the semester. The final written examination, weighted at 50%, will include both closed-ended questions (e.g., multiple-choice, matching, true/false) and open-ended questions (e.g., short-answer, essay-type, case studies). The examination will have a duration of two academic periods and will evaluate students' overall understanding of the course content, their ability to synthesize theoretical and practical knowledge, and their critical thinking skills.</p> <p>Student performance is evaluated on a scale of 0 to 100, with a minimum overall passing grade of 60. The final grade is calculated as a weighted average of the assessment components described above.</p>	• Attendance and course participation:	10%	• Individual reports relating to practical aspects	40%	• Final written examination	50%
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Language	Greek or English						