

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	350KEY	SEMESTER	8
COURSE TITLE	GREEN INFRASTRUCTURE AND SMART CITY		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	3	5	
Laboratory exercises			
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Optional Compulsory		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Acquire basic knowledge of the principles of sustainable design, green construction and infrastructure, as well as environmental assessment techniques for urban and construction projects. • Understand the concept of the Smart City and the role of emerging technologies in promoting urban sustainability and resilience. • Analyze the potential and limitations of technological solutions in upgrading urban infrastructure and services, assessing their environmental, social, and economic impacts. • Become familiar with developing strategies and roadmaps for transitioning to green and smart urban models.

- Use indicators, data analysis platforms, and basic algorithms to evaluate service performance and optimize city operations.
- Understand the role of governance, cross-sectoral collaboration, and citizen participation in shaping smart city strategies.
- Develop critical thinking regarding the challenges of integrating green, smart infrastructure into existing urban planning frameworks, considering institutional, technical, and social constraints.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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Upon successful completion of the course, students will have acquired the following general skills:

- Research, analysis, and synthesis of data and information, using appropriate technologies
- Decision-making
- Independent and teamwork
- Respect for the natural and built environment
- Demonstration of social, professional, and ethical responsibility and sensitivity
- Promotion of free, creative, and inductive thinking

(3) SYLLABUS

The course “Green Infrastructure and Smart City” offers an interdisciplinary approach to understanding the role of smart technologies in shaping green, sustainable, and resilient urban environments. It focuses on strategies for transitioning from conventional infrastructures to green, smart, and interconnected systems, aiming to enhance quality of life, increase efficiency, and reduce environmental pressures.

The concept of the Smart City is approached as a tool for achieving environmental sustainability through digital transformation, smart resource and waste management, circular economy practices, smart energy systems, and green construction and infrastructure.

Students analyze Smart City planning strategies, develop implementation roadmaps, study examples of green infrastructure and smart urban regeneration, and participate in a project-based design exercise of a Green and Smart Neighborhood. Special topics include Smart Urban Mobility, Smart City Indicators, decision-making tools, and the challenges and barriers transitioning toward greener, smarter, and more resilient urban systems.

The course syllabus is covered through the following lectures:

- Introduction to Green Infrastructure and the Smart City Concept
- Green Construction and Infrastructure

- Smart Energy Systems
- Circular Economy and Smart Waste Management
- Smart City Strategy and Roadmap Development
- Green and Smart Urban Regeneration
- Green and Smart Urban Mobility
- Digital Transformation and Governance
- Smart City Indicators
- Applications and Algorithms for the Smart City
- Challenges and Barriers in the Transition to Smart Cities
- Lab Practice: Designing a Green and Smart Neighborhood

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT for the completion of the assignments	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Assignments	40
	Study	51
	Total	130
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Language of evaluation: Greek Student grading is based on performance in each component of the course: <ul style="list-style-type: none"> • Theory exercises (20%) • Midterm project presentation (20%) • Final semester project (60%) To successfully complete the course, students must achieve a passing grade in each component: <ul style="list-style-type: none"> • Minimum passing grade: ≥ 5 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Athopoulos, L. (2022). Smart Cities and Intelligent Governance. Kritiki Publications. ISBN: 9789605864125

- Kalamaras, V. (2023). "Green" buildings with zero energy footprint. Iambos Publications.
- Tambakopoulos, N. (2020). Smart Cities and Information & Communication Technologies. Tziolas Publications
- Buhalis, D., Taheri, B., Rahimi, R. (2023). Smart Cities and Tourism: Co-creating Experiences, Challenges and Opportunities. Oxford: Goodfellow Publishers
- Kirwan, G. C., Zhiyong, F. (2023). Smart Cities and Artificial Intelligence: The Future of Urban Planning. Elsevier

- Related academic journals:

- Scientific journal: Cities
- Scientific journal: Sustainable Cities and Society
- Scientific journal: Smart Cities
- Special Report 24/2023: Smart Cities
- World Smart Cities Outlook 2024