R4.2b U-CARE Teaching and training materials #2 Healthy urban design and planning for Mediterranean cities

WP4 U-CARE Learning Modules and the Academic Implementation

Partners: UCY
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Review process

Version	Authors	Reviewers	Assessment
V01	Ilaria Geddes; Frixos Petrou	N/A [WIP]	N/A [WIP]
V02	Ilaria Geddes; Frixos Petrou	ALL PARTNERS	Course timeline to be adapted based on international seminar dates
V03	Ilaria Geddes; Frixos Petrou	ALL PARTNERS	Syllabus to be adapted based on feedback from decision-making workshop Assignment criteria to be adapted based on inclusion of readings' presentations by students
V04	Ilaria Geddes; Frixos Petrou	Antonia Sore	Course description to be edited to reflect content of stormwater runoff session
V05	Ilaria Geddes; Frixos Petrou	Alvaro Valera Sosa	Lecture summary updated
V06	Ilaria Geddes; Frixos Petrou	Philip Stilke	Approved

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Executive Summary

This document presents Result 4.2b, which includes the syllabus, didactic material and open educational resources for teaching pilot course 2 at the University of Cyprus between September and December 2025.

The document is divided into three sections:

1. Introduction
2. Syllabus
3. Annex

The Introduction provides an overview of the document and its contents. The Course Description details the contents and approach of the pilot course and includes the link to the relevant resources, teaching and learning materials. The Syllabus lists the teaching sessions of course, including seminars, fieldwork and group work sessions. The annex provides the one-page summaries of each lecture.

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1. Introduction

This document provides a structured overview of UCY's Pilot Course 2 (Modules 3 and 4). This U-CARE Pilot courses translate UrbanCare's core research topics and its five areas of application (developed as part of the project's WP2) into practical training modules. Both the course syllabus and didactic materials, including lectures (presentations and videos, glossary, exercises, real-life case studies) and other materials needed for delivering Pilot Course 2 are developed as part of the project's work package 4, activity 4.2.

Starting from the knowledge acquired in WP2 (dedicated to the knowledge transfer of UrbanCare's Methodology to HEI partners and applying it to four real case studies in different European cities) the pilot courses aim to create evidence-based design research and practice learning modules that tackle 'real-world' impacts in the fight against the global climate and health crises effectively by equipping students with practical skills in urban health design, environmental assessment, and data management, bridging the gap between research and real-world impact in urban health and climate resilience.

The course will be integrated into the APH540 course at the Department of Architecture of the University of Cyprus. The broad theme of the course is Mediterranean Cities with a specific focus each year; for the U-CARE pilot, the title of the course will be **Healthy urban design and planning for Mediterranean cities**. The course is a post-graduate level course open to 4th and 5th year students of the Integrated Master's in Architecture programme, and to PhD students, providing 8 ECTS.

The course responds to the following challenges identified by project partners in the first phase of WP4:

- Absence of the key topic of healthy urban design within the curriculum.
- Shallow understanding of the evidence about the built environment's impact on health outcomes.
- Need for students to develop fieldwork skills, data reading and manipulation skills, and participatory skills.

Based on the above considerations, the U-CARE consortium integrated the Urban Care core themes (Walkability, Urban Heat, Stormwater Runoff, and Biotope Loss) into the pilot courses in a way that is sensitive to each university's unique interests and

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expertise, while upskilling students across all the HEIs to a more advanced level of knowledge and understanding of urban health.

Pilot 2 developed by UCY delves into more detail about the indicators of walkability and urban heat, with a specific focus on planning and urban design practice. Concerning the evidence-based solutions approach, the UCY pilot course focuses on different perspectives as follows:

- **Walkability-Public Health:** The role of walkability in reducing accidents, non-contagious diseases, and promoting active lifestyles.
- **Urban Heat-Public Health:** Mitigating urban heat-related health issues.
- **Biotope Loss-Public Health**: The connection between biodiversity, mental health, and ecosystem services.

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2. Course Description

This course addresses urban health in the specific context and semi-arid climate of Cyprus. It builds upon the Urban Care 3-step methodology developed by Building Health Lab and adapted to the U-CARE research project: 1) conducting research with mixed methods to structure case studies; 2) exercise data management and spatial analyses using visual data models for the case studies; 3) execute decision-making workshops with local stakeholders.

To support the application of this methodology, the course makes use of the UrbanCare Data Viewer App – an analytical immersive visual data model – developed for the Nicosia case study. Students will use the Data Viewer to gain an understanding of environmental conditions, pedestrian exposure, and potential health impacts of the case study. In parallel, the decentralized version of the U-CARE Web Platform, hosted on Notion, is used as the course learning environment, enabling students to access, download, and review teaching materials, assignments, and the course schedule at: https://ucareproject.notion.site/Healthy-urban-design-and-planning-for-Mediterranean-Cities-2306c542bea0807abfdec64a3e3dd651

The course focuses on four pillars of urban health: walkability and spatial equity, urban heat mitigation, stormwater management, and biotope preservation. It will deliver lectures covering the theoretical and conceptual framework of healthy cities and presenting the core concepts with a specific focus on walkability and urban heat, and the role of urban design in addressing health challenges:

- The role of walkability in reducing accidents and non-contagious diseases and promoting active lifestyles.
- Mitigating urban heat-related health hazards through green infrastructures.
- The connection between biodiversity, mental health and ecosystems services.
- Reducing water runoff pollution and health risks.

Practical applications of healthy urbanism will be exemplified through case studies. The students will work on a local case study: the area surrounding the Makarios Hospital in Strovolos and specifically three pedestrian routes which were researched by the U-CARE team members. Students will have access to the research materials and tools used for the analysis of the case study: an immersive web viewer including evaluations of the pedestrian routes, urban health case site reports and the outcomes of decision-making workshops with stakeholders.

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The course will be delivered in hybrid format at the University of Cyprus with lectures in presence and online by external speakers from both academia and practice, and online participation by students at the partner universities (TU Berlin, Chalmers University of Technology, University of Florence).

Practical sessions will involve the students in fieldwork, desk-based research and participatory planning, feeding into the course assessment tasks including, presentations of readings, a group design exercise and visual presentation, and an individual essay (report).

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3. Syllabus

#	Title	Content	Date	Lecturers
1	Introductory Session	Welcome session. Introduction to the course. Presentation of the Nicosia case study. The U-CARE Platform. How cities define our health and happiness: introductory video to urban health.	12 Sep	Ilaria Geddes and Frixos Petrou (UCY)
2	The impact of urban design & planning on health outcomes. Setting up working groups and brief for assignments.	Lecture; quiz; discussion in pairs.	19 Sep	Ilaria Geddes (UCY)
3	Mobility, walkability and health. Students' presentation and discussion of reading #1	Lecture; quiz; group discussion. Group discussion	26 Sep	Ilaria Geddes (UCY)
4	Urban heat and public health Students' presentation and discussion of reading #2	Lecture, quiz; discussion in pairs. Group Discussion	3 Oct	Antonia Sore (UNIFI)
5	Case study site visit	Fieldwork	10 Oct	Ilaria Geddes and Frixos Petrou (UCY)
6	Biotope and public health: designing nature-based solutions for cities Students' presentation and discussion of reading #3	Lecture; quiz; group discussion. Group Discussion	17 Oct	Alvaro Valera Sosa (BHL)
7	Design/analysis charrette workshop for students	Developing healthy urban solutions through participatory design. Use of viewer & quick representations of issues and solutions.	24 Oct	Student-led.
8a	SUCY Departmental Seminar	Health-centred design practice	30 Oct	Jacob Van Rijs (TU Berlin)

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#	Title	Content	Date	Lecturers
8b	International Seminar	Welcome and introduction to U-CARE Climate change, cities and health in the Mediterranean Research findings from the U-CARE case studies: Gothenburg, Berlin, Florence, Nicosia Break The WHO Healthy Cities Network: strategies and implementation in Cyprus Lessons learned from WeeDRIVE in Limassol From strategies to practice: making our cities healthier (title tbc) Open discussion inc. journalists	31 Oct	Philip Stilke (TU Berlin); Alvaro Valera Sosa (BHL); Ilaria Geddes (UCY) Prof. Mark Nieuwenhuijsen (ISGlobal) Goran Lindhal (CHALMERS), Alvaro Valera Sosa (BHL), Rosa Romano and Antonia Sore (UNIFI), Ilaria Geddes and Frixos Petrou (UCY) Chrystala Kaiafa (Ministry of Health) Christos Gartzonikas Photoula Hadjipapa (Mayor of Lakatamia)
9	Stormwater runoff and public health. Students' presentation and discussion of reading #4	Lecture, quiz; group discussion Group Discussion	7 Nov	Antonia Sore (UNIFI)
10	Project scope definition workshop	Students distill the outcomes of previous lectures and exercises into a unified project approach	14 Nov	N/A
11	Project development workshop	Students develop their project and informally present progress to tutors in groups	21 Nov	N/A
12	Interim presentations	Students informally present their projects and receive peer and tutor feedback	28 Nov	N/A
13	Final presentations	Students formally present their projects & essays and receive peer and tutor feedback	5 Dec	N/A

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4. Assessment criteria

Participation (25%): This component evaluates students' engagement in lectures, discussions, group work, field trips, and workshops.

Individual Report (25%): Students must write a report based on a qualitative analysis of their chosen urban scene from their case study. Students will be provided with a pre-set questionnaire that they should carry out on site with public space users to respond to the question: what is the users' perception and experience of the selected urban scene?

Understanding of literature (10%): Students will be assigned a scientific paper to read and present to their peers.

Final Presentation (40%): This group work project allows various presentation formats, including posters, PowerPoint presentations, videos, sketches, or models. The assessment will consider the presentation's content and quality, with individual contributions evaluated separately. Each group member is expected to participate verbally. Criteria for assessing the final presentation include:

- Understanding of the selected thematic area based on the literature
- Addressing relevant questions and challenges
- Describing and analysing urban health issues of the selected urban scene
- Drafting design recommendations and explaining the potential outcomes of their implementation

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5. ANNEX: Lectures' Summaries

This section outlines the sessions included in the U-CARE UCY Pilot Course. The lectures which include lecture summaries below are highlighted in bold; the remaining activities are practical or purely informational (e.g., course introduction).

1. Introductory Session
2. **The impact of urban design & planning on health outcomes.**
3. **Mobility, walkability and health.**
4. **Urban heat and public health**
5. Case study site visit
6. **Biotope and public health: designing nature-based solutions for cities**
7. Design/analysis charrette workshop for students
8. SUCY Departmental Seminar
9. International Seminar
10. **Stormwater runoff and public health.**
11. Project scope definition workshop
12. Project development workshop
13. Interim presentations
14. Final presentations

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The impact of urban design & planning on health outcomes

Lecturer: Ilaria Geddes
Affiliation: University of Cyprus

Expected Learning Outcomes

- Describe key factors of the built environment which influence health
- Comprehend the type of relationship between spatial inequalities and health outcomes
- Describe the historical evolution of the field of urban health
- Name factors influencing health over which urban designer and planners can have an impact
- Hypothesize whether a design and planning choice will have a positive or negative impact on population health

Lecture Summary

The lecture introduces the field of urban health through its historical development with a specific focus on planning theories and frameworks. Key built environment and spatial factors influencing health are outlined, highlighting the complexity of interactions between multiple factors determining health outcomes.
Specific factors which can be influenced by planning and urban design are discussed in more detail (air pollution, green space, walkability), indicating methods through which they can be measured and highlighting the evidence of their impact on health, wellbeing and quality of life. Data and research from Nicosia and international studies are presented. How the design of cities in terms of urban form and housing typologies leads to different outcomes is discussed. Particular attention is given to the evidence about the impact of green space on health. Examples of urban design interventions towards healthier environments are showcased, leading to a discussion about the most recent approaches and the role of politics in achieving change in cities.
Finally, a current urban development case study (Ebbsfleet Garden City) is presented to encourage students to reflect and hypothesise on the long-term outcomes that it may deliver.

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Mobility, walkability and health

Lecturer: Ilaria Geddes
Affiliation: University of Cyprus

Expected Learning Outcomes

- Describe both beneficial and harmful impacts of transport
- Comprehend the health benefits of physical activity
- Describe the health and environmental benefits of active mobility
- Comprehend the relationship between urban form and walkability
- Identify which types of interventions are most effective at increasing active travel
- Argue about the relative importance of infrastructural and cultural factors in mobility choices

Lecture Summary

The lecture explains how transport in general can have positive and negative effects on health, focusing on active travel as a form of physical activity, which also provides health and environmental co-benefits through reduction in air and noise pollution. A distinction is made between physical activity and active travel as informal exercise to explore whether they have similar health benefits and, specifically, the extent of the benefits of walking.
A definition of walkability is provided, covering functional and perceptual qualities. We then delve into the research about whether walkability actually increases active travel and which components of the built form are 'structural', more permanent elements of walkability as opposed to components which are easier to change through planning, lighter interventions and programming. Research about the effectiveness of different types of interventions to increase active travel is presented along with results from the UK Cycling Demonstration Town programme.
The key features of designing for physical activity are covered, accompanied by research on how to support active travel to secondary schools in Nicosia through urban design based on a study of accidents locations and their surrounding infrastructure.
The concept of travel time budget is explained in relation to the supply and demand for road infrastructure and what its relevant to shifting mobility choices.
Finally, the case study of Vauban in Freiburg, Germany, is presented as an exemplary case of a multi-component intervention with a strong environmental vision, which made it particularly successful in supporting active travel.

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Urban heat and public health

Lecturer: Antonia Sore
Affiliation: University of Florence, Department of Architecture (DIdA)

Expected Learning Outcomes

- **Identify** the key public health risks associated with extreme heat, especially for vulnerable populations.
- **Analyze** how urban design, surface materials, and land cover influence thermal comfort and heat exposure.
- **Explore** mitigation strategies for urban heat effects.
- **Apply** principles of climate-resilient design and Nature-based Solutions to mitigate urban heat.
- **Incorporate** heat mitigation strategies into their own design projects, with a focus on co-benefits for health and equity.

Lecture Summary

As climate change drives increasingly frequent and intense heat events, urban areas face growing challenges in protecting public health. Vulnerable groups such as children, the elderly, disabled people, and low-income communities are particularly exposed to the adverse effects of the heat in the cities. The lecture explores the causes and consequences of Urban Heat Islands (UHI), examining how urban form, materials, and land use patterns contribute to elevated temperatures and thermal discomfort.

Students will learn about the direct and indirect health effects of heat exposure, including heat stress, respiratory and cardiovascular risks, and mental health impacts, as well as how social and spatial inequalities exacerbate these effects. The lecture introduces key principles of climate-resilient design and explores how Nature-based Solutions (NbS) such as urban greening, tree canopy expansion, and permeable surfaces can help mitigate urban heat, enhance outdoor comfort, and increase well-being.

Furthermore, the lecture aims to provide input and inspiration for developing project proposals during the pilot course.

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Biotope and Public Health: Nature-Based Solutions in Streets for Urban Economic and Social Wellbeing

Lecturer: Alvaro Valera Sosa
Affiliation: Building Health Lab

Expected Learning Outcomes

- Understand why slower-paced and vulnerable groups are the critical reference point for designing equitable and sustainable streets.
- Explain how street-scale spatial inequities accumulate into city-scale health, climate, and economic problems.
- Identify and apply the four mitigation targets—walkability, stormwater runoff, urban heat, and biotope loss—when evaluating street environments.
- Recognize how reducing effort and exposure doses along daily pedestrian paths improves public health outcomes.
- Distinguish priority urban scenes (stops and stations, crossings, respite areas, and priority entrances) and their role within pedestrian loops.
- Assess the health, environmental, and economic co-benefits of nature-based street interventions.
- Apply the sequential strategy of enhance, unseal, shade, then greenify to guide people-first street design.
- Translate qualitative and quantitative street observations into evidence-based proposals for equitable green streets.

Lecture Summary

The lecture frames equitable street design through the lived experience of slower-paced groups, drawing on the UrbanCare methodology to demonstrate that sustainability cannot be achieved without prioritizing those most exposed to environmental stressors. It challenges conventional interpretations of concepts such as the 15-minute city by showing how distance, effort, and exposure disproportionately affect children, older adults, and people with limited mobility. By focusing on pedestrian loops and recurring urban scenes, the lecture shows that street-scale problems repeat systematically across cities, making local interventions a powerful lever for city-wide health and climate resilience.

Building on this foundation, the lecture links spatial inequities to measurable health and economic impacts across walkability, runoff, heat, and biotope loss. It demonstrates how targeted, people-first interventions generate cascading benefits, from reduced disease burden and energy demand to lower infrastructure costs and increased urban value. The proposed design logic of enhance, unseal, shade, then

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greenify positions nature-based solutions as the outcome of equity-driven design rather than an aesthetic add-on. Ultimately, the lecture provides a clear and actionable framework, articulated through UrbanCare, for aligning urban design, public health, and climate mitigation at both human and city scales.

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U-Care

Stormwater runoff and public health

Lecturer: Antonia Sore
Affiliation: University of Florence, Department of Architecture (DIdA)

Expected Learning Outcomes

- **Explain** the concept of stormwater runoff and its environmental impact.
- **Understand** the connection between stormwater management and waterborne disease prevention.
- **Describe** how stormwater can impact drinking water quality.
- **Identify** WSUD design and planning strategies to manage stormwater.
- **Analyze** and calculate the runoff index.

Lecture Summary

As urban areas expand and climate extremes intensify, managing stormwater runoff is a crucial priority for safeguarding both public health, resources, and environmental quality. The lecture explores the interconnections between stormwater, urban design, and health, highlighting how inadequate surface water management can contribute to flooding, the spread of pollutants, and waterborne diseases.

Drawing on principles of Water-Sensitive Urban Design (WSUD), the lecture explores how strategies such as green infrastructure and rainwater harvesting mitigate runoff pollution, prevent contamination of drinking water sources, and support healthier urban environments. Furthermore, the lecture also addresses the role of water-saving practices and the importance of safeguarding water quality in the context of increasing demand and limited freshwater resources. Through case studies and simple assessment tools (e.g., stormwater index), students will gain insight into how urban design and planning decisions can reduce health risks and support long-term water resilience.

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