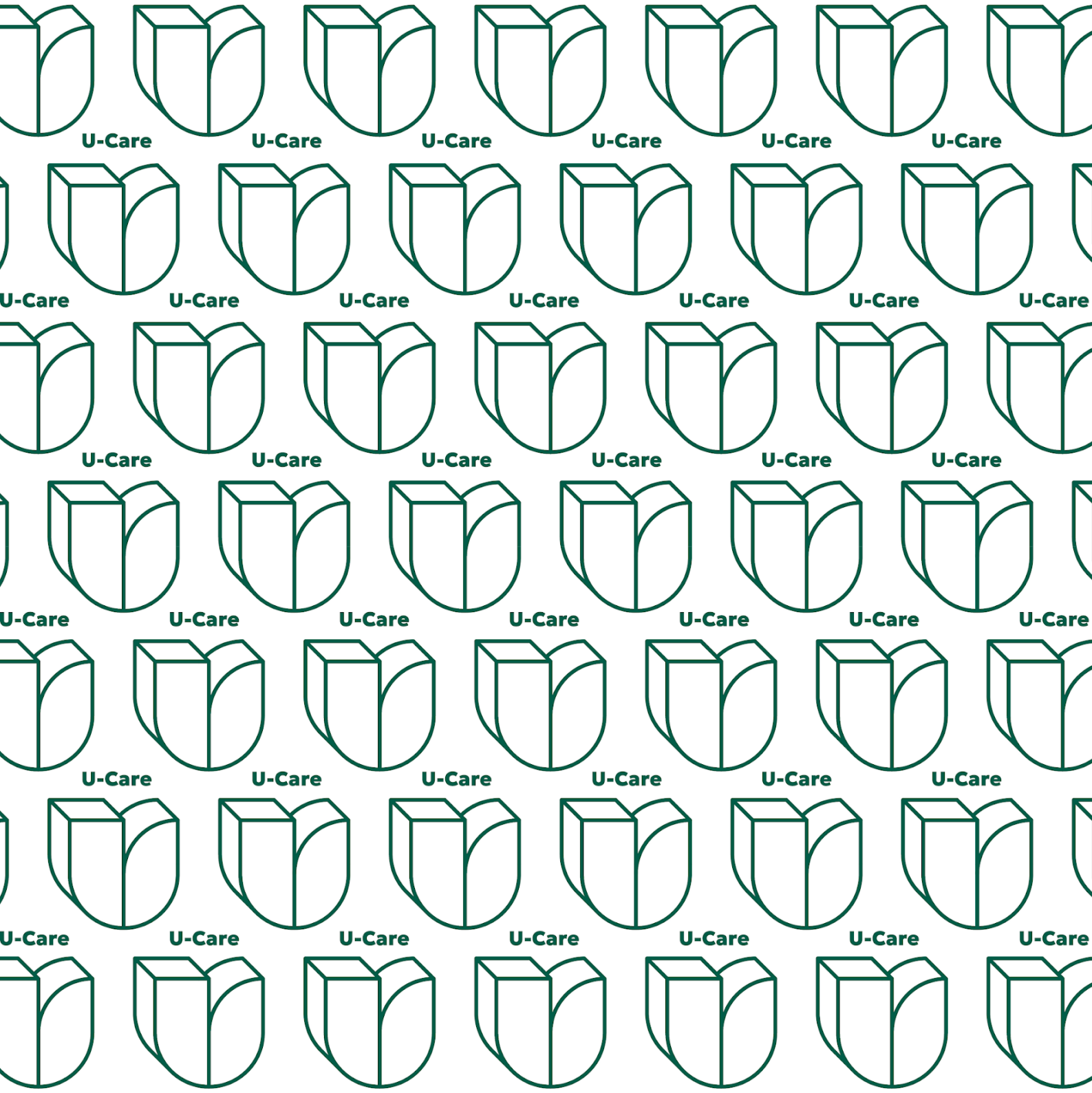

R4.1 Curricula Survey for Module Implementation

WP4_U-CARE Learning Modules and Academic Implementation

Partners: UCY, Chalmers, UNIFI, BHL, TU Berlin, RESET
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Date: 21/01/2025

Co-funded by the European Union

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Project number: 2023-1-ES01-KA220-HED-000155347

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Document information

Grant Agreement Number	NO. 2023-1-DE01-KA220-HED-000161246	**Acronym**	**U-CARE**
Project Full Title	Urban CARE to battle climate change impacts on urban ecosystems and health across different European climate zones.		
Erasmus+ Call	KA220 HED - Cooperation partnerships in higher education		
Type of Action	Higher Education (HED)		
Start Date	01/11/2023	**Duration (in months)**	36 months
Deliverable	R4.1 Curricula Survey for Module Implementation		
Work Package	WP4 U-CARE Learning Modules and the Academic Implementation		
Nature	R – Report		
Lead Beneficiary	UCY		
Contributing Beneficiaries	BHL, TU Berlin, UNIFI		

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Review process

Version	Authors	Reviewers	Assessment
V01	Ilaria Geddes, Frixos Petrou	Rosa Romano, Antonia Sore, Alvaro Valera Sosa, Göran Lindahl	Edits, comments, suggestions, corrections
V02	Ilaria Geddes, Frixos Petrou	Philip Stillke	Approved

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Contents

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1. Introduction

The purpose of this report is to support and prepare for the implementation of the U-CARE pilot courses at participating universities. The report presents the timeframe for their implementation, the processes to register the pilot courses in institutional curricula and their path towards approval and accreditation by the Higher Education Institutions (HEIs). Each HEI has scoped opportunities within their curricula for module implementation, either within existing courses or as new courses. Furthermore, they elaborated on how to integrate the urban care themes within their course based on the specific focus of each pilot, their organisational expertise and interests, gaps in their educational offer, and expected interest by students and added value for their institutions. These opportunities and reflections were gathered via a survey and a series of interviews conducted by the University of Cyprus (UCY) as the lead of *WP4 U-CARE Learning Modules and Academic Implementation*.

One of U-CARE's aims is to establish five new learning modules in the participating HEIs based on the UrbanCare 3-step methodology: 1. urban health research; 2. neighbourhood diagnostics, and 3. decision-making workshops. WP4 falls within the capacity-building and training component of the U-CARE project, piloting modules which aim to develop students' skills in various sustainable development sectors, meeting the requirements of the future green labour market.

As planned at the project proposal stage, three pilot courses will be implemented:

1. Pilot 1 at the University of Florence (UNIFI) focuses on data management practices (module 1) and environmental health impact assessment (module 2).
2. Pilot 2 at the University of Cyprus (UCY) focuses on urban health policy and planning (module 3), as well as health-centred urban planning and design (module 4).
3. Pilot 3 at Chalmers University of Technology (CHALMERS) focuses on sustainable value creation in urban planning and business development in relationship to health (module 5).

While the courses will share the Urban Care themes of urban heat, walkability, stormwater runoff, and biotope loss, they will differ to reflect the participating HEIs' diverse but complementary expertise, offering students the opportunity to experience different aspects of the urban health field. The present survey has the objective of fitting the pilot courses within the HEIs existing curricula and academic frameworks, to ensure that the piloting is effectively embedded within each institution's structure and needs, to benefit both the universities and their students.

A key aspect of the pilot courses is that they will build upon the research carried out for the project during *WP2 UrbanCare Methodology Knowledge Transfer* and make use of the U-CARE platform developed during *WP3 U-CARE Web Platform* which will provide urban health reports of the case study areas in the cities where the pilot courses are implemented, and an immersive platform with embedded data to visualise the health impacts of urban environments.

2. Methodology

As a starting point to map educational activities a curricula survey was conducted in two phases. Initially, an online survey containing twelve questions was distributed to the participating HEIs. The questions listed in the appendix of this document in section 6 focused on potential timelines and procedural aspects of integrating the pilot courses into existing institutional curricula. Following the online survey, 30-minute interviews (figure 1) were held with collaborators from each HEI in order to gather more in-depth insights and clarify specific points regarding the pilot course registration and accreditation at each institution, as well as to identify common themes in terms of gaps in curricula and student knowledge. The interview questions are also listed in section 6. A total of four interviews were conducted with representatives from the University of Cyprus, the University of Florence, and Chalmers University of Technology – as the organisations implementing the pilot courses and Building Health Lab – as the organisation leading on the knowledge transfer.

Figure 1. Snapshot of interview with Chalmers University of Technology.

These discussions focused on various aspects of the pilot courses, including their potential themes and alignment with institutional goals. Additionally, the interviews explored the level of potential interest from students in the courses, based on the participants' experience in other courses. The conversations also delved into the anticipated outcomes for the HEIs, such as how these pilot courses could address gaps in existing curricula and what learning outcomes are expected for the participating students.

Following the questionnaires and interviews, a matrix to map the U-CARE themes against the pilot courses was produced to integrate these into the pilots, based on the analysis of the responses. The matrix is structured to cover shared UrbanCare concepts, scientific problem assessment, and evidence-based solutions approach. Initially mapping was carried out by UCY, reviewed and approved by partners.

In the following sections, we present the implementation procedure (section 3), the pilot courses rationale and content (section 4), and a summary of this research including decisions taken about how to integrate the UrbanCare themes into the courses (section 5).

3. Implementation procedure

3.1 Timeframe for implementation

Each partner HEI had different regulations for the approval of courses within their institutions:

- Chalmers University: For this pilot course, a test is developed based on an existing facility and service management course. The course adapts and is refined with UrbanCare content to comply with the learning objective of the U-CARE project. This also aligns with intended and expected development of the course to include well being in service eco-systems. After the evaluation of the test course, a further pilot is developed for implementation in the fall of 2025 (IBY015 Service Management for Construction and Facilities). The intention is that this will result in a new and implemented version of the course, thus delivering a new course curricula.

- University of Florence: Replacing the existing content of established courses with new materials and topics is complex. The university, however, hosts a program of Thematic Seminars, which can accommodate new content. These must be approved by the Faculty Council. While proposals can be submitted at any time, it is recommended to align them with the start of the academic year. The latest deadline for submission is one month before the seminar begins. In our case, early 2025 for implementation in March 2025. In this case, it is preferable to **implement the pilot as a stand-alone course.**

- University of Cyprus: Whether the course is piloted as a new offering or integrated into an existing one affects the approval process. A new course requires a lengthy, complex approval through the academic senate, with documentation submission by January 2025 for implementation in the fall of 2025. In contrast, integration into an existing course is much simpler. This can be done by reopening a non-running course that aligns with U-CARE themes, or by integrating it into an active course, provided the instructor is willing to accommodate the content, which is typically the case. For this reason, it is preferable to **integrate the pilot within an existing course** (APH549 Specialised Topics in Urban Design and Planning).

Following mapping and discussion with the partners, it was decided that it would be beneficial to test how the UrbanCare themes, case studies, and platform can be integrated into the pilot courses before deployment. For these purposes:

- Chalmers University of Technology established a ‘testing ground’ course (Pilot 3a) in the fall of 2024; actually applying and integrating UrbanCare themes and concept fully as a development of the said course as basis for the course assignment.

- Florence University has organised a pilot course to analyse the Italian case study in June 2024, developed as a thematic seminar, that has involved 11 students and 7 researchers.

Both pilot modules introduced the UrbanCare framework, methodology, and platform, featuring four site models. These courses were used as an opportunity to test students' engagement in collaborating in the development of the U-CARE Platform by contributing to assessing the urban health indicators established through WP2, feeding the platform's case models for future versions, and gaining feedback on the platform and lectures which will form the shared components of all pilot courses.

This initial iteration functioned as the interface between the knowledge transfer and the pilot courses in order to tailor the lectures about the shared concepts for Pilots 1 and 2 and refine Pilot 3 for a second iteration as Pilot 3b at the same institutions, which emphasized business development, service logic and management skills integrated in a sustainability approach. Based on survey answers and the addition of Pilot 3a into the U-CARE programme, the timeframe for implementation of the pilot courses was established (figure 2).

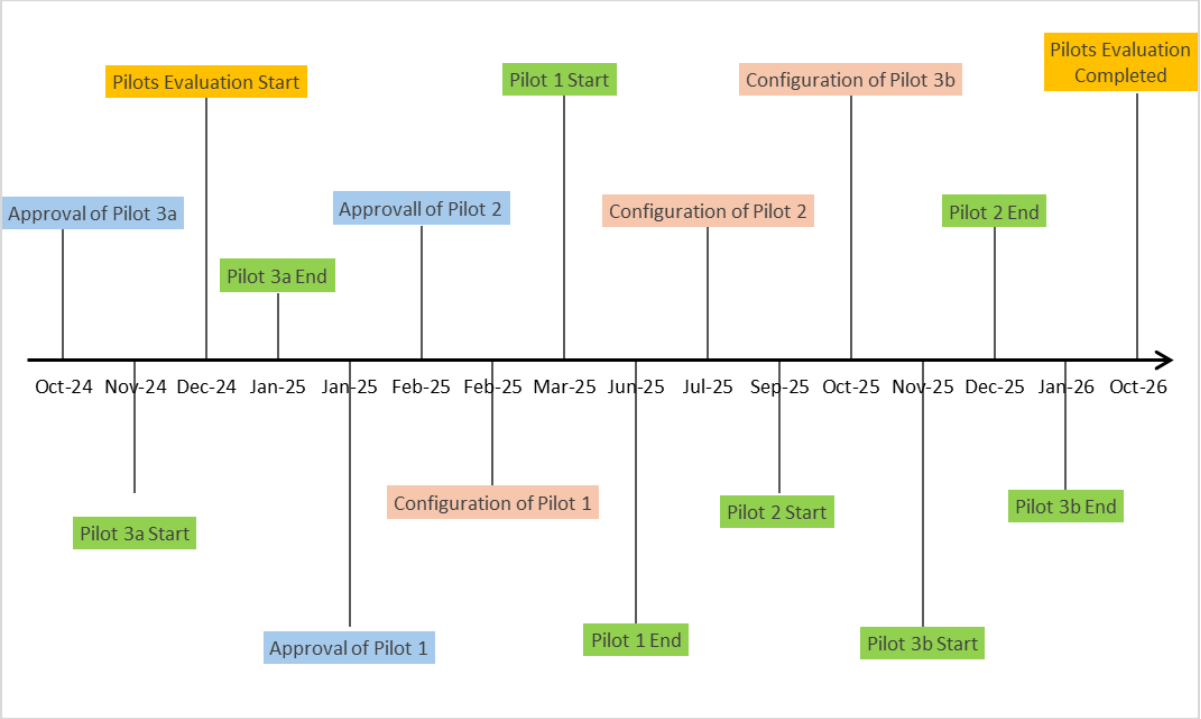

Figure 2. Timeline for implementation of U-CARE pilot courses.

Table 1 below summarises the key characteristics of the pilot courses from the survey responses.

Table 1. Key characteristics of U-CARE pilot courses.

Hostin HEI	Teaching hour to ECTS credit ratio	Can external participants follow course?
UNIFI (Pilot 1)	25 hours	Yes, but cannot provide official transcript
UCY (Pilot 2)	25 hours	Yes, with advance notice
Chalmers (Pilot 3)	26.6 hours	No

3.2 Accreditation and external participants

Accreditation also varies slightly between institutions, but it is comparable. The teaching hour to ECTS ratio is 25 hours for the University of Cyprus and the University of Florence, while it is 26.6 hours for Chalmers. Additionally, the institutions have different regulations about access by external participants not registered at the hosting university (table 2).

Pilot (Lead)	Planned dates for the pilot course	Can the pilot course be in hybrid format?	Stand-alone or within existing module	Minimum or maximum number of students
Pilot 3a (Chalmers)	November 2024-January 2025	Yes	Existing module	N/A
Pilot 1 (UNIFI)	March-June 2025	Yes	Stand-alone	30 max or 50 upon request
Pilot 2 (UCY)	September-December 2025	Yes	Existing module	Minimum of 4 students, maximum is variable
Pilot 3b (Chalmers)	November 2025-January 2026	Yes	Existing module	N/A

Table 2. Accreditation and external participants are given access to the hosting universities.

Details concerning external student participation are included below, as explained via the survey responses.

- University of Florence: The course can be attended by external participants, and a certificate of attendance will be issued to participants who attend at least 75% of the sessions. This certificate, featuring the Institute logo, will be signed

by the scientific coordinator, who will detail the equivalent ECTS. However, the certificate cannot be issued directly by the University institution (e.g. with an official transcript). External participants must register for the course through the U-CARE platform to be eligible for attendance.

- University of Cyprus: The course can be opened to external students with prior approval. External students must possess an 'ac' email address to be eligible for registration and need to contact the course leader to provide their details well ahead of the registration deadline as they need to be registered manually by UCY staff. Their assessment and accreditation will be consistent with that of UCY students, and they will receive an official UCY transcript for the module.

- Chalmers University of Technology: Chalmers' regulations do not normally allow participation by those who are not registered at their institution. Due to the timeframe, Pilot 3a will not be open to external participants. Chalmers team members aim to support possibilities for opening Pilot 3b to external participants within the framework of an Erasmus+ project. This in turn related to other Erasmus exchange frameworks and initiatives like for example Enhance. Any current exchange and/or Erasmus student at Chalmers within the subject area, architecture and civil engineering, can take the course.

4. Pilot courses rationale and content

4.1 How the courses fill gaps in the educational offer

4.1.1 Reasons why partners joined the U-CARE Consortium

The representative from BHL expressed their primary interest in further developing and validating the urban care framework, which they initiated. They emphasized the need to validate the methodology across four distinct climate zones by developing case studies that explore local conditions and planning strategies to mitigate climate change and support public health. They also noted the opportunity to connect fragmented expertise at TU Berlin in collaboration with them as an industry partner. The urban management program and the architecture school, coordinated by Jacob van Rijs – the project coordinator, were highlighted as key resources for integrating urban health content and achieving synergies within the U-CARE project.

The interviewee from the University of Florence explained that their decision to join the consortium stemmed from their focus on environmental design, particularly in creating resilient and innovative spaces to mitigate climate change effects. They expressed enthusiasm about collaborating on the project, noting that the Erasmus initiative provides an opportunity to develop more specialized courses for students. These courses will emphasize environmental design and its application on a human scale. They highlighted the value of creating a course to share with students from diverse geographical areas and universities.

The interviewee from the University of Cyprus explained that their involvement in the consortium is driven by their research lab's interest in urban health, which is currently underrepresented in university courses. While some related aspects are briefly covered, urban health as a distinct field is largely absent. Their goal is to develop educational materials that could be incorporated into new courses or potentially a master's program. They noted that the U-CARE pilot course will be offered as a postgraduate course for fifth-year architecture students, with ongoing discussions about creating a master's program in planning. Having ready-made and validated teaching materials for elective courses in the future would be particularly advantageous.

The representative from Chalmers University noted that their decision to join the consortium was influenced by growing awareness of environmentally related climate changes in Sweden, particularly the increase in hotspots and rainfall patterns as well as changed sow-load patterns. These shifts deviate from previous climate patterns which today are reflected in standards and regulations. Their interest, and academic study focus, in healthcare, specifically in designing hospital areas that can sustainably

manage these new environmental challenges, also played a key role in their involvement.

4.1.2 The importance of including urban care themes in postgraduate study

The interviewee from BHL emphasized a practical approach to the project, advocating for introducing more applied elements in postgraduate curricula. They noted that the added value of the courses lies in fostering dialogue with municipalities and planning institutes, such as the Urban Land Institute, an international consortium. This real-world focus helps students better understand practical challenges. Additionally, they stressed the importance of operationalizing urban health by transforming it from an abstract concept into practical, measurable, and implementable terms. This approach is essential for students to fully grasp how to assess, improve, and evaluate urban health interventions.

The representatives from the University of Florence emphasized the importance of advancing education in Italy, particularly in environmental design. Traditional academic courses often provide only a basic understanding due to students' lack of prior knowledge. As students progress in their careers, they need to study more specialised topics, such as those in the U-CARE project, which focuses on urban and micro-urban resilient design. Furthermore, ongoing education for architecture and urban design professionals is essential for fostering regenerative, restorative, and resilient design practices.

The representative from the University of Cyprus noted that while people generally recognize the built environment's impact on health, they often lack the scientific knowledge to support this understanding, as existing courses do not provide sufficient data. Individuals (students and professionals in the field) know that factors like air pollution and sedentary lifestyles are detrimental to health but do not learn how these elements determine health outcomes in their studies. By gaining this knowledge, particularly those pursuing public sector planning and urban design careers, they will be better equipped to incorporate health considerations into their policy and design work. Additionally, those entering social professions or civil society can make more compelling arguments for necessary changes when they possess a solid understanding of the relevant data.

The interviewee from Chalmers University emphasized the significance of addressing complex systems issues within urban care themes, particularly at the postgraduate level. They noted that postgraduate students possess the maturity and background necessary to effectively manage these complexities, making this level of study the most suitable for such discussions. It is also assumed that this systems perspective is a crucial competence expected of today's students.

4.1.3 Existing courses already covering urban care themes

The survey inquired about existing courses at each institution that cover urban care themes, details of which are included below.

University of Florence:

The topics are occasionally covered in design studio courses, though their focus changes annually. Related courses include those on landscape, bioclimatic design, and ecology. "Specialised Topics in Environmental Design" are touched upon across various classes in the first and second-level master's programmes. Furthermore, the U-CARE topics are also addressed in the following design laboratories:

5-year single-cycle master's degree in ARCHITECTURE

- IV year: B015353 - ENVIRONMENTAL DESIGN LABORATORY
- V year: B026328 - URBAN PLANNING LABORATORY

Master's degree in Architecture (CdLM)

- II year: B018863 - ARCHITECTURE AND ENVIRONMENT LABORATORY
- II year: B018859 - ARCHITECTURE AND CITY LABORATORY

II level Master ABITA Bio-ecological Architecture and Technological Innovation for the Environment - Module 1 - Regenerative Urban Design for Climate Adaptation

University of Cyprus: The topics are occasionally covered in design studio courses, though their focus changes annually. Related courses include those on landscape, bioclimatic design, and ecology. "Specialised Topics in Urban Planning and Design" tends to cover all U-CARE themes, although briefly. Potentially relevant courses include:

- ARH101 Architectural Design II
- ARH340 Landscape Architecture
- ARH 431 Bioclimatic Design
- ARH412 Architecture and the Critical History of Ecology
- ARH511 Architecture and Ecology: Critical Perspective
- ARH538 Environmental Building Design
- ARH548 Landscape Architecture and the Urban
- ARH549 Specialised Topics in Urban Planning and Design

Chalmers University of Technology: The subject is crucial for tomorrow's architects and engineers and as such integrated in general in course curricula. Several courses take a sustainability perspective, focusing on regeneration and circularity. Thus a portion of every course can have relevance for or benefit from the U-CARE project,

specificall courses on urban design. However, integration of design, sustainability and service management is only addressed in the course:

- IBY015, Service Management for Construction and Facilities

4.1.4 Topics proposed at each institution

The survey also asked the participants to expand upon the specific topics/themes of the pilot courses at their respective institutions.

University of Florence: Methodologies and key performance indicators (KPIs) for collecting and returning data will support the resilient design of urban spaces. The focus is on innovative design strategies and solutions that enhance urban walkability for diverse users while mitigating the adverse effects of climate change—such as heat islands, lack of permeable surfaces, and loss of biodiversity—and their subsequent impact on human health.

University of Cyprus: The course could be titled "Healthy Urbanism" or "Introduction to Urban Health" to clearly convey its focus on design and planning policy compared to other pilot courses. It may cover key issues and challenges in contemporary city planning, as well as theoretical and conceptual frameworks for healthy cities, both historical and contemporary. The course will explore how urban environments impact health and emphasize systems thinking for sustainable development, highlighting the relationship between urban environments and the Sustainable Development Goals (SDGs). Additionally, it should address the design of human-centric cities, the interplay between local health and global sustainability, and the importance of healthy homes and public spaces. Topics could also include inclusive urbanism, which encompasses participation, universal accessibility, age-friendliness, and heritage; sustainable mobility with a focus on active travel; green infrastructure; and case studies on implementing healthy places.

Chalmers University: The course provides a comprehensive introduction to the principles of specifying and producing services, with a particular focus on construction and facilities-related services, such as Facilities Management (FM). Rather than viewing the built environment as a static product, the course frames it as a dynamic resource, facility, or enabler of broader functions. This approach aligns with the service logic adopted in real estate and facilities management, emphasizing how built spaces support and facilitate services. The UrbanCare module shapes this approach by focusing on the intersection of health, climate, and urban design. It introduces data-driven processes and urban planning strategies that directly address public health and climate outcomes. Structured with four input lectures and practical tasks, the module ensures students use data and research to inform their planning decisions. Through these sessions, students will learn to analyse and interpret data, developing spatial strategies that improve public health and local climate. Students will apply this knowledge to the course's group assignment. Through hands-on tasks, they will address real-world urban challenges such as walkability, urban heat, stormwater runoff, and biotope loss, ensuring their solutions are grounded in both data-driven

insights and practical application. Following the mapping of the U-CARE themes against the proposed topics, each theme was embedded within the pilots from the perspective of each institution's focus: data management and KPI; planning policy and urban design; facilities management and service delivery.

	PILOT 1: Data Management and Environmental Health Impact Assessment [UNIFI]	PILOT 2: Healthy Urban Design and Planning [UCY]	PILOT 3A: Urban Health and Facility Management [CHALMERS]	PILOT 3B: Urban Health and Development Management [CHALMERS] To be reviewed following Pilot 3a
Walkability	How walkable environments contribute to reducing carbon emissions.	The role of walkability in reducing accidents, contagious and non-contagious diseases, and promoting active lifestyles.	Enhance integrated active travel: how walkable environments influence health.	Enhance integrated active travel: how walkable environments influence health.
Urban Heat	Addressing urban heat as part of climate resilience strategies.	Mitigating heat-related health issues.	Provide shade to save energy, support staff recovery: understanding the urban heat island effect and its impacts on the health of staff and vulnerable groups.	Provide shade to save energy: understanding the urban heat island effect and its impacts on the health of vulnerable groups.
Stormwater Runoff	Addressing stormwater runoff as part of climate resilience strategies.	Reducing waterborne diseases and safeguarding drinking water supplies.	Unseal to implement water-sensitive plans: the health risks associated with unmanaged stormwater, impacts on flooding and drown on public health.	Unseal to implement water-sensitive plans: the health risks associated with unmanaged stormwater, impacts on flooding and drown on public health.
Biotope Loss	Balancing climate mitigation strategies with biodiversity conservation.	The connection between biodiversity, mental health, and ecosystem services.	Greenify for rich biodiversity: how the loss of natural habitats affects health as well as integrates with built environment design and effects.	Greenify for rich biodiversity: how the loss of natural habitats affects health.

Table 3. Approach to U-CARE themes in each pilot course.

4.1.5 Specific gaps that the U-CARE pilot courses will address

The interviewee from BHL highlighted that the project aligns with their mission to bridge academia and practice. Understanding the academic landscape in the four participating countries enhances their credibility and provides tools to engage decision-makers. They noted the value of learning from Mediterranean climates, such as Cyprus and Florence, to address challenges like heat and drought in continental climates and oceanic environments like Gothenburg. Comparing research, planning, and policy approaches across these countries will help refine their methods. They also mentioned an interest in ongoing projects in Nicosia, such as using space syntax for urban health. Florence's close collaboration between local government and university, functioning as a unified body in decision-making, was noted as a model to potentially replicate in Germany. The representative emphasized the importance of developing courses that connect postgraduate students with municipal planners.

One gap noted by interviewees from the University of Florence is the limited time to work with students on participatory processes or design projects. They believe the Urban Care project provides a valuable opportunity to utilize tools and methodologies for engaging with city residents. Another identified gap is the lack of tools, such as environmental design digital tools, to quantify the impact of projects. They assert that this course will be instrumental in helping students learn how to measure the impact of their design proposals.

The interviewee from the University of Cyprus stated that the pilot course will cover topics only briefly addressed in other courses. While focusing on specific areas, students will also have access to pilot courses offered by other institutions. For example, the collaboration with the University of Florence includes modelling environmental impacts using environmental design digital tools, which is not covered in their curriculum. Their course will emphasize healthy urban design and policymaking, promoting active travel environments and addressing car dependency issues. There is often insufficient emphasis on the benefits of creating walkable environments, with discussions predominantly centered on planning legislation and parking requirements linked to car culture. Despite existing expertise within the department, it is often limited to research projects and not effectively integrated into educational content. U-CARE aims to bridge this gap.

The representative from Chalmers University stated that they primarily enhance existing courses by integrating the perspective of urban planning into architectural and engineering management studies. U-CARE supports this process and provides tools and platforms. This approach enables architecture and engineering students to understand the interaction between urban planning and building design as a cohesive project. Additionally, it fosters collaborations with other departments within the university and external organizations, particularly in hospital facility management, enriching the practice-oriented discussions and work.

4.1.6 Gaging student interest in pilot courses

The representative from BHL highlighted their experience teaching at institutions like the University of Florence and Chalmers, which has provided insights into student interests and knowledge gaps. Many students express surprise and curiosity when introduced to new subjects, particularly within the urban care framework that includes research, planning, design, and policy considerations. While some are keen on environmental assessments, such as using thermal cameras and data processing, they often overlook health research, like disease incidence. Demonstrating the connection between environmental issues and health impacts makes public health more relevant to students. Confusion between planning and design is common, especially at the University of Cyprus, where planning should involve multi-stakeholder efforts and open dialogue. This attracts students interested in the circular economy and nature-based solutions. Engaging students in the policy aspect is challenging, as it is often seen as less appealing, despite its critical importance.

The University of Florence interviewees expressed that students are strongly interested in urban care topics. Recently, they organized a workshop in Florence with the participation of ten final-year students, who demonstrated significant engagement. The proposed approach of having students follow the activities and apply the methodologies appears effective in involving them and encouraging the application of these methodologies even after course completion. Furthermore, they noted that during the recent workshop, students exhibited a lot of interest and surprise at the topics, with many "wow" moments, indicating a deeper curiosity they may not have initially recognized. Although these topics are not always emphasized in the curriculum, interest has notably increased, especially post-COVID, as urban health gains prominence. They believe that greater awareness of these subjects could further enhance student interest.

The interviewee from the University of Cyprus highlighted that students show a keen interest in walkability and green design. They are aware of car dependency and sustainability issues but often lack knowledge on how to address them or recognize that walkability is a distinct field within the built environment. Students are interested in designing green spaces and integrating green elements into architecture but often lack a strong understanding of their relationship to climate change and environmental impacts, as well as health. This interest is reflected in their work in design studios and workshops, where many focus on sustainability and nature-based solutions. Additionally, there is a consistent, albeit modest, interest in topics like water infrastructure each year, even if they are not the most popular subjects.

The representative from Chalmers University highlighted students' interest in the course, as they recognize the challenges of climate change on urban microenvironments. The course equips them with essential terminology and tools for proactive engagement. While students may not have explicitly requested greater complexity, they acknowledge its importance, and the course provides a framework for managing it. They are encouraged to integrate their building designs with the

surrounding environment, considering implications like acoustics, social sustainability, business development and microclimates, which opens up new opportunities for engagement with these critical issues.

4.1.6 Added value and educational value of pilot courses

The Interviewee from BHL emphasized the significance of an international consortium, noting that it introduces a crucial layer of research to the architecture department that has been lacking in recent years. The architecture school has been encouraged to enhance its research efforts and seek funding opportunities. They view this consortium as a vital stepping stone, particularly within TU Berlin's department, to foster collaboration and secure projects internally. Additionally, the urban management program will benefit from increased focus on urban health and diverse perspectives from international lecturers, which will enhance the curriculum and broaden students' understanding.

The University of Florence representatives highlighted that the project's added value lies in addressing gaps in current environmental design courses by dedicating more time to urban health topics. It offers students the chance to learn from instructors and peers at other universities, gaining insights into diverse methodologies for tackling climate change in outdoor space design. This level of interaction is typically achieved only through grants or Erasmus activities; moreover, the urban health project facilitates the organization of workshops and teaching activities involving experienced professionals from across Europe. Additionally, incorporating online courses provides flexibility for student participation, featuring an accessible interface that allows them to engage with videos and other materials.

The representative from the University of Cyprus noted that the course will yield valuable educational materials for future workshops and courses while strengthening collaborations with partners. Ongoing projects with various partners enhance continuous cooperation through relevant conferences and dissemination of findings from multiple initiatives. Educationally, the course aims to deepen students' understanding of how the built environment impacts health. When exposed to data, both students and stakeholders are often surprised by the correlation between air quality and mortality, motivating them to address these issues in innovative ways within their future design and planning work.

The interviewee from Chalmers University emphasized that the course would enhance knowledge and practical strategies for addressing microclimate challenges around buildings. While architects recognize the importance of microclimate issues, the course focuses on actionable steps to address them, both in the short and long term. It goes beyond merely acknowledging problems like heat islands and flooding to actively finding solutions, instead it concerns ecosystems and built environment in its use and business context to identify drivers in the AEC and real-estate sector. This approach not only benefits students but also strengthens the department of

Architecture and Civil Engineering by equipping future professionals with the necessary skills to tackle these complexities.

4.2 Linking U-CARE research and education

4.2.1 The use of local case studies

The survey participants were asked to respond to how the local case studies would be used within their proposed pilot course.

Urban case studies provide real-world site assessments that analyze specific urban environments at a pedestrian-reach scale, focusing on spatial dynamics, environmental factors, and mobility conditions. Unlike city-scale data, which is widely available but generalized, these studies capture localized urban challenges and their impacts on accessibility, public health, and climate resilience.

A key advantage of urban case studies is their ability to gather and analyze disaggregated data on walkability, urban heat, surface runoff, and biotope loss—critical aspects often absent from large-scale urban datasets. While city-scale data provides an overview, it lacks the granularity needed for site-specific interventions. By collecting high-resolution, location-specific information, urban case studies ensure well-documented and informed decision-making in planning and design, directly addressing the realities of the built environment.

Beyond their immediate impact, urban case studies play a crucial role in upscaling solutions and translating successful interventions to similar urban areas with comparable climatic conditions. This ensures that data-driven strategies are not only site-specific but also adaptable to broader urban contexts, reinforcing evidence-based urban planning that enhances sustainability, resilience, and inclusivity across cities.

University of Florence:
The local pilot case study will serve both as a research example and as practical applications of the theoretical concepts and techniques discussed throughout the course. At the beginning of the pilot course the case study and first research results will be presented to the students to showcase research context and the application of the UrbanCare methodology. Following this initial step, the students will work on the case study applying step by step the knowledge gained during the lectures and putting into practice theoretical knowledge and new research and design methods. Furthermore, the U-CARE stakeholder workshop will be organized in parallel to the Florence Pilot course giving students a first hand experience in co-design sessions with stakeholders and allowing them to gather direct input for analysis and design from the citizens and key local actors. At the end of the course, the students will

present their final outputs both to the higher education experts from the U-CARE consortium and as well to the local community and stakeholders.

University of Cyprus: The pilot course would serve two primary purposes. Firstly, it would connect the characteristics of the site to the topics covered in the lectures. This may involve one or more site visits and the utilization of the U-CARE viewer, enabling students to relate lecture content to specific locations and assess the health of those places. Secondly it would provide a basis for students' assignments, allowing them to build upon the research conducted by the U-CARE team and insights gained from decision-making workshops. Students would develop design solutions or planning policies for the site, addressing specific topics of interest. One aim of the course will be to enable students to engage with stakeholders, and the case study should enable this.

Chalmers University: The objective for connecting and implementing the U-CARE research and approach in courses is based on the aim to bring sustainability approaches into a systems perspective outside the pure technical. In addition, there is a purpose of adapting a resource-based perspective on facilities and real estate. Eco-systems and service logics are key concepts here, as is the concept of Servicescape. The U-CARE approach will be the frame for the case that will form the applications basis for the training and knowledge development. The structure of the U-CARE approach allows for an interconnection between value creation and urban health challenges.

4.3 Learning outcomes and assessment criteria

4.3.1 Preliminary expected learning outcomes of the pilot courses

The preliminary expected learning outcomes were covered first by the survey and then expanded upon in the interviews.

University of Florence:

- Acquire knowledge of innovative design strategies and solutions that enhance urban walkability for diverse users while mitigating the negative impacts of climate change, such as heat islands, lack of permeable surfaces, and loss of biodiversity, along with their subsequent effects on human health.
- Learn new methodologies for collecting and analyzing data to support resilient urban design.
- Enhance understanding of cutting-edge technologies, including LiDAR, high-resolution cameras, and thermal sensors, for evaluating the environmental performance of the built environment.

- Explore the effectiveness of integrating low-impact, reversible, and accessible technological solutions to improve outdoor comfort in urban areas adjacent to school buildings undergoing significant renovation.

University of Cyprus: Expected outcomes will likely include a mix of transferable and field-specific skills, varying by topic based on the depth of knowledge required and the number of lectures dedicated to each subject. A range of cognitive levels will be applied, such as:

- Describe and understand the potential impacts of heritage on health (basic level, briefly covered).
- Relate air pollution to health outcomes (mid-level).
- Explain how green spaces affect mental health (mid-level).
- Hypothesize how characteristics of a case study may influence local health outcomes (advanced).
- Apply systems thinking to develop policy solutions addressing case study issues (advanced).

Chalmers University: An extended repertoire of the student's capability to deal with urban planning challenges against a backdrop of changing climate as described below:

- Understand the importance of climate effects on urban areas utilizing microclimate aspects and effects of these
- Describe and understand relationships between different drivers for integration of climate and sustainability aspects with business drivers in real-estate
- Learn to address drivers and develop them in projects and ecosystems
- Apply systems thinking to develop conceptual development design for urban areas/districts

4.3.2 Specific competencies that students lack to be addressed by U-CARE pilot courses

The BHL interviewee emphasized a general lack of understanding regarding urban health, noting that climate design and spatial design for public health are often treated as separate disciplines. The urban care framework seeks to integrate these areas. There is a need to correlate environmental data with health impacts to make public health more tangible and relevant. While students show interest in environmental assessments and biodiversity, they require a clearer connection to public health outcomes. The representative stressed the necessity for greater intersection among modules, advocating for a departure from a siloed departmental approach. They concluded that while the foundational elements are present, effective coordination and a strong executive team are essential to unify these efforts.

The representatives from the University of Florence highlighted that students find it particularly interesting to work on urban health topics. They emphasized that the innovative aspect of this course lies in its in-depth research on health data about users and citizens, as well as identifying vulnerable groups within the city. Typically, urban design focuses on a larger scale; however, this course uniquely combines health, climate change, climate resilience, and walkability themes. Furthermore, the introduction of environmental design digital tools, which are usually reserved for specialized courses or second-level master's degrees, is seen as essential. They advocate for integrating these tools into the regular curriculum to address emerging challenges better. Additionally, they believe that field studies, especially those utilizing thermal images, will add significant value, as such practical experiences are often lacking in current courses.

The representative from the University of Cyprus noted a particular gap in digital skills among architecture students. While they are proficient in design software such as AutoCAD, Illustrator, and Photoshop, they lack experience with analytical tools like environmental design digital software and GIS, as well as statistical analysis software for digital or geolocated data. Additionally, fieldwork is an area of concern; students rarely engage in on-site measurement and analysis, often conducting superficial observations during site visits for design courses. The goal is for students to not only observe but also understand the underlying factors affecting the built environment. Through U-CARE, there is a desire to integrate these skills into the curriculum. Furthermore, the ability to interact effectively with stakeholders is deemed essential. The course will incorporate decision-making workshops and dissemination activities to enhance students' competencies in presenting and collaborating with professionals from diverse backgrounds.

The interviewee from Chalmers University mentioned that the analysis planned for this project differs from what students typically experience. While students are aware of the challenges posed by climate change, this course equips them with the necessary tools and clarity to address these issues effectively. This understanding is crucial for their future professional endeavours. They noted that the primary challenge lies in developing analytical skills. While students are often adept at learning and utilizing new digital tools, this course emphasizes enhancing their intellectual capabilities to incorporate a broader range of factors into their analyses.

4.3.3 Predicted educational outcome for students

The representative from BHL expressed hope that students will acquire a more diverse set of perspectives and gain insights into various practical realities. For instance, understanding the differences in mobility issues across cities like Berlin, Gothenburg, and Nicosia will enable students to move beyond a narrow viewpoint and appreciate the complexities of real-world problems.

According to the University of Florence interviewees, the project enhances educational outcomes for students by addressing gaps in current environmental design courses and focusing on urban health topics. Through collaboration with instructors and peers from various universities, students gain valuable insights into diverse methodologies for addressing climate change in outdoor space design. Integrating online courses further increases accessibility and flexibility, enabling students to engage meaningfully with course materials and professionals across Europe.

The representative from the University of Cyprus emphasized that students attending the pilot at University of Florence would benefit from gaining proficiency in environmental design tools, particularly for international projects. Key to their learning will be understanding successful design case studies and adapting these principles to the context in Cyprus. While this may represent a high-level learning outcome that is challenging to assess, it aligns with the objectives of the pilot course and its case study approach. At Chalmers, the focus extends beyond design to encompass project management and sustainability, prompting students to consider the long-term viability of their designs, including financing maintenance and overall implementability.

The representative from Chalmers University expressed hope that students will enhance their ability to understand and tackle complex problems based on a systems approach, understanding the built environment as a mediator and facilitator for well-being and sustainable conditions. The course aims to equip the students with the tools and terminology necessary for analysing, discussing and solving issues, ultimately improving their professional competence and their contributions to their future teams in the AEC-sector.

4.3.4 Interactions with stakeholders through the pilot courses

The BHL representative categorized stakeholders into two main groups: community stakeholders and development practitioners, which include municipalities and private companies. For municipalities and private entities, recognizing the value of student internships and assistance with specific tasks is essential, as it equips students with practical know-how that benefits the organization. In community contexts, student participation is vital for establishing connections with gatekeepers. When Building Health Lab engages with a community, the reception may be mixed, with residents often wary of data collection and its intended use. In contrast, at universities it typically experiences a more favourable reception. Therefore, student involvement is crucial for obtaining authentic and meaningful data from communities. To enhance stakeholder management, it is important to tailor environmental studies by developing appropriate protocols and refining the curriculum.

According to the University of Florence interviewees, the pilot course will facilitate interaction with stakeholders, including public administrators and small to medium

enterprises, interested in transforming urban spaces into more resilient and sustainable environments. Through developing design proposals for real case studies, students will engage with stakeholders to address their challenges in managing urban spaces regarding social, environmental, and economic sustainability. This innovative approach enriches the educational experience and equips students to collaborate effectively with stakeholders on projects that enhance outdoor environments and mitigate climate change's negative effects. Additionally, involving citizens in the pilot project will showcase the positive impacts of the design approaches in real life.

The representative from the University of Cyprus highlighted the importance of aligning the course with stakeholder meetings. Students typically produce high-quality, analytical work that is relevant to stakeholders and contributes to research efforts. By inviting stakeholders to final presentations, the aim is to ensure engagement through evidence-based solutions rather than conceptual designs, thereby enhancing the real-world relevance and impact of students' work.

The representative from Chalmers University highlighted the tradition of high stakeholder interaction in Swedish design projects, mandated by the Code Determination Act of 1975, which ensures staff representation in redesign and reorganization efforts. This fosters comprehensive discussions beyond just the buildings, allowing for greater input from municipalities involved in urban planning. The approach aims to broaden participation, enhancing municipalities' working methods while deepening the understanding of both stakeholders and users, who have distinct interests and needs despite some overlap.

4.3.5 Preliminary Assessment Criteria

The survey covered preliminary assessment criteria to be used for each pilot course.

University of Florence:

Participation (30%): This component evaluates students' engagement in lectures, group work, field trips, and workshops.

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 a literature review
- Addressing relevant questions and challenges
- Describing, analysing, and discussing outcomes of the project, whether through detailed small-scale studies or macro-scale desk-based investigations
- Drawing inferences from the analysis

- Drafting design recommendations

- Individual Essay (30%): Students must write an essay based on their case study analysis of the chosen thematic area and pilot case study. .

University of Cyprus:

Participation (30%): This component evaluates students' engagement in lectures, group work, field trips, and workshops.

Final Presentation (40%): This group work project allows various presentation formats, including posters, PowerPoint presentations, videos, sketches, or models. The assessment will consider both the content and quality of the presentation, 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 a literature review
- Addressing relevant questions and challenges
- Describing, analyzing, and discussing outcomes of the project, whether through detailed small-scale studies or macro-scale desk-based investigations
- Drawing inferences from the analysis
- Drafting policy and design recommendations

Individual Essay (30%): Students are required to write a 2500-word essay (excluding references) based on their case study analysis of the chosen thematic area and scale. These essays will support the group work policy recommendation.

Chalmers University:

Basic grading for participating students as listed below.

Examination is based on the following:

- Active participation at lectures. Compulsory and graded fail/pass. Lacking participation leads to complementing assignments.
- Project work/group assignment, U-CARE approach. Compulsory and graded fail/pass. Approximately 40% of the course work.
- Participation in a literature workshop. Compulsory and graded fail/pass. Non-participation renders a literature assignment.
- Written home exam, essay style, based on course literature and lectures. Out of 40p maximum, 20p is needed to pass, 30p equals grade 4 and 36p equals grade 5.

Grades for the course are Fail (U), 3, 4 and 5. Written exam, lecture Q&A sessions and assignments have to be completed to get course grade.

5. Conclusions

The results of the curricula survey and interviews conducted emphasize the critical need to address urban health and climate change in education, with each institution having its unique focus. BHL mentioned validating an urban care framework across different climate zones, while the University of Cyprus aimed to address the underrepresentation of urban health in architecture programs by creating new materials for advanced students. Chalmers focused on sustainable hospital design to respond to climate changes in Sweden, and the University of Florence discussed creating resilient spaces and specialized courses for a diverse student body.

There was consensus on the importance of incorporating urban care themes into postgraduate studies. BHL advocated for more practical, applied approaches that engage municipalities and planning institutes. At the same time, the University of Cyprus stressed the need for data-driven insights on issues like air pollution and walkability to better equip students in urban design and public sector planning. Chalmers highlighted the ability of postgraduate students to handle complex urban health challenges, noting that undergraduates might struggle with these topics. The University of Florence pointed out that traditional environmental design courses offer only a basic understanding of the relationship between health and the environment, advocating for a more in-depth exploration of resilient and regenerative design practices.

The current gaps in curricula were also addressed. BHL emphasized bridging academia and practice by using case studies to tackle environmental challenges. The University of Cyprus noted the absence of key topics like healthy urban design and active travel and using digital tools in order to fill these gaps. Chalmers underscored the need for interdisciplinary collaboration between urban planning and architecture, while Florence emphasized the need for quantifiable tools to measure design impacts, seeing U-CARE as an opportunity to better engage students with real-world urban care issues.

A shared challenge was the need for more interdisciplinary education to address urban health effectively. BHL noted the disconnect between climate design and public health, calling for a unified framework linking environmental data with health outcomes. The University of Cyprus focused on addressing students' digital skills gaps, especially in the use of analytical tools and fieldwork. Chalmers stressed the importance of developing strong analytical skills to tackle climate challenges, while Florence advocated for integrating health data research with climate resilience and walkability into the curriculum.

It was clear that students are increasingly interested in urban health but often lack the practical skills to address these issues. The University of Cyprus observed that students are keen on topics like walkability and green design but need more knowledge to approach sustainability effectively. Chalmers noted that students

recognize the complexity of climate change and the need to integrate building design with environmental factors. The University of Florence also reported growing student interest in urban care, particularly following the COVID-19 pandemic, with workshops sparking curiosity and engagement .

Finally, it was evident from the interviews that the U-CARE project adds significant educational value by filling gaps in existing curricula. BHL noted that the international consortium revitalizes research efforts and collaboration around urban health. The University of Cyprus highlighted the project's role in producing valuable educational materials and deepening students' understanding of health impacts in the built environment. Chalmers emphasized the practical strategies students will gain for addressing microclimate challenges, and Florence pointed out the opportunity to address gaps in environmental design education through flexible, interdisciplinary courses. Overall, the aspiration is that the pilot courses will contribute to preparing students to tackle the complex challenges of urban design and public health with climate change mitigation and adaptation.

Based on the above considerations the U-CARE consortium developed a framework to integrate the Urban Care themes into the pilot courses in a way that is sensitive to each university's unique interests and expertise, while upskilling students across all the HEIs to a more advanced level of knowledge and understanding of urban health. The courses will therefore share lectures and learning materials regarding key urban health concepts:

- Walkability. Enhance integrated active travel: how walkable environments Influence Health;
- Urban Heat. Provide shade to save energy: understanding the urban heat island effect and its impacts on the health of vulnerable groups;
- Stormwater Runoff. Unseal to implement water-sensitive plans: the health risks associated with unmanaged stormwater, impacts on flooding and drowning on public health;
- Biotope Loss. Greenify for rich biodiversity: how the loss of natural habitats affects health.

Each course will then focus on specific elements of scientific problems assessment, which Pilots 3a and 3b engaging students in the development of the U-CARE platform (3a), assessing urban health indicators and upskilling students' knowledge of climate-related issues in the built environment. Pilot 1 will delve in more detail into quantitative and qualitative indicators of urban heat and stormwater runoff, and quantitative indicators of biotope loss. Finally, Pilot 2 will concentrate on quantitative and qualitative indicators of walkability, as well as qualitative indicators of biotope loss.

Concerning the evidence-based solutions approach, the three HEIs will focus on different perspectives as follows:

University of Florence:

- Walkability-Climate: How walkable environments contribute to reducing carbon emissions.
- Urban Heat-Climate: Addressing urban heat as part of climate resilience strategies.
- Stormwater Runoff-Climate: Addressing stormwater as part of broader water-sensitive urban design.
- Biotope Loss-Climate: balancing climate mitigation strategies with biodiversity conservation.

University of Cyprus:

- Walkability-Public Health: The role of walkability in reducing accidents, contagious and non-contagious diseases, and promoting active lifestyles.
- Urban Heat-Public Health: Mitigating heat-related health issues.
- Stormwater Runoff-Public Health: Reducing waterborne diseases and safeguarding drinking water supplies.
- Biotope Loss-Public Health: The connection between biodiversity, mental health, and ecosystem services.

Chalmers University of Technology:

- Biotope Loss-Public Health: The connection between biodiversity, mental health, and ecosystem services.
- Urban Heat-Economy: cost savings through energy efficiency and reducing healthcare expenditure.
- Stormwater Runoff-Economy: The financial benefits of sustainable water management and reduced infrastructure damage.
- Biotope Loss-Economy: The economic benefits of biodiversity, including ecosystem services, energy optimization with passive cooling, and increased property values.
- Service points: Identifying service and business needs/opportunities aligned with climate challenges (draft concept only)

Figure 3 summarises how the urban care themes are integrated into the pilot courses.

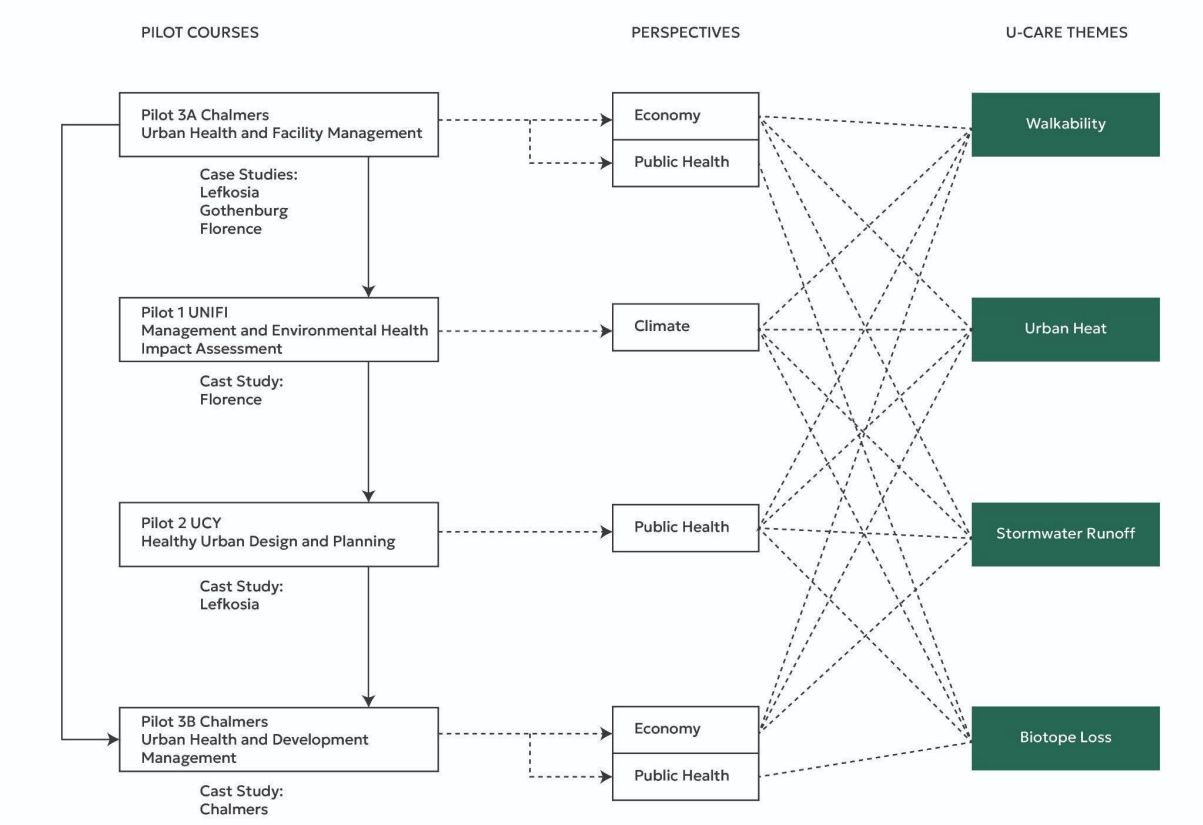

Figure 3. Mapping pilot courses to specific perspectives and urban care themes

6. Annex

6.1 Survey questions

1. What are your planned dates for the pilot course? [short answer text]

2. What is the teaching hour to ECTS credit ration at your institution? [short answer text]

3. What are the approval process and deadlines for approval of the pilot course at your institution? [long-answer text]

4. Which of your institution's courses already cover areas of urban care methodology? (walkability, water infrastructure, urban climate, nature-based solutions). Please provide the course code and link to the course description if available. [long-answer text]

5. What are the proposed themes/topics of your **pilot course** (aligned with the proposal)? [long-answer text]

6. How do you plan to use your local case study within the **pilot course**? [long-answer text]

7. Is it possible to carry out the **pilot course** in a hybrid (in-person + online) format? [yes/no]

8. Can the **pilot course** be opened to external participants? If so, please explain how: 1. accreditation for external participants would work at your institution; 2. external participants would register for the course. [long-answer text]

9. Will the **pilot course** be a standalone or within an existing module? [standalone/existing module]

10. What are your proposed assessment criteria for the **pilot course** at this stage? [long-answer text]

11. Is there a minimum or maximum number of students required for the **pilot course**? [short answer text]

12. What are the preliminary expected learning outcomes of the **pilot course**? [long-answer text]

6.2 Interview Questions

1. Why did you decide to join the U-CARE consortium particularly about its educational aspect?

2. Why do you believe including the urban care themes in postgraduate study is important?

3. Are there any specific gaps at your institution that you are trying to fill with the U-CARE pilot course, either in terms of topics or collaborations with other institutions in Europe?

4. Are there any specific competences (either field-related or generic) that you think the U-CARE pilot course will support that are missing in the curriculum or the students are generally lacking? [prompts if needed: fieldwork, interacting with stakeholders, digital skills, U-CARE platform]

5. Do you believe (or know) that students are interested in urban care topics and which ones? Is it generally urban health or a specific topic? If there is interest from students, how did you become aware? If there is not, why are you doing a pilot course?

6. What do you think the pilot course will bring to your institution in terms of added value and educational value?

7. What do you hope will be the educational outcome for students attending your pilot course or remotely attending another university?

8. How will pilot courses help you / your students interact more effectively and frequently with stakeholders?