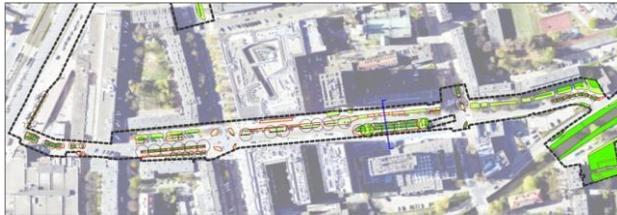


 <p>Analysis of outdoor comfort and wind analysis source: prof. Danilo Di Donato</p>  <p>Heweliusza street case study - source H EUROPE ClimaGen</p>	<p>Term: 2 sem. (summer)</p>	<p>Studies on outdoor comfort Heweliusza Street Gdansk case study</p> <p>Elective design II</p>	<p>ECTS: 5</p>
	<p>Type of studies: MSc in Arch.</p>		<p>Year: 2025/2026</p>
<p>Department of Housing Architecture & DALab</p>			
<p>Seminars & assignments: 60 h Teacher & Tutors: Visiting Prof. Danilo Di Donato. (University of L'Aquila), with the support of teaching staff from Gdansk Tech DA Lab</p>			
<p>Brief description of the subject: This elective design course explores outdoor comfort in urban public spaces in the city of Gdańsk, with a specific focus on Heweliusza Street as a contemporary case study. The course investigates how microclimatic conditions, spatial configuration, materiality, greenery, mobility patterns, and social use influence thermal, acoustic, and experiential comfort in dense urban environments. By situating Heweliusza Street within Gdańsk's historical and morphological context, the course examines the relationship between urban form, climate adaptation, and every day public life. The course aims to develop a systematic framework for evaluating outdoor comfort in urban streets and public spaces, combining environmental analysis with human-centered design approaches. Emphasis is placed on understanding seasonal variability, wind and solar exposure, shading strategies, surface materials, and the interaction between pedestrian activity and surrounding building typologies. The objective is to raise awareness of outdoor comfort as a key component of urban resilience and quality of life, and to support evidence-based design strategies for climate-sensitive urban transformation. Through on-site measurements, behavioral observations, mapping, and participatory methods, students will collect and analyze data along Heweliusza Street. The results of the work will be organized into a structured repository consisting of six thematic research chapters: Microclimatic Conditions, Street Morphology and Comfort, Materiality and Surface Performance, Green Infrastructure and Shading, Mobility and Human Use, and Adaptive Design Strategies. Students will create a shared digital archive containing environmental data, analytical diagrams, maps, photographs, and design reflections. The outcomes will be presented in a final exhibition. The course will be conducted in a block format, combining field trips, on-site research, seminars, and group discussions. The course is linked to the CLIMAGEN Horizon project and Urban ElemenTREE DUT project</p>			

Objectives:

The aim of the course is to explore the key challenges of sustainable design related to outdoor comfort in contemporary urban environments, using Heweliusza Street in Gdańsk as a case study. Shaped by office buildings, mixed-use developments and active ground floors, the street serves as a real-life laboratory in which to examine how urban form, functional intensity, and everyday use affect the quality and comfort of public spaces in the digital era. The specific objectives are:

- 1) Understanding the problems of outdoor comfort in high-intensity, business-oriented urban areas that are typical of Baltic cities. Students will analyse microclimatic conditions, such as solar exposure, shading, wind behaviour, heat stress and material performance, as well as the interaction between office buildings, commercial ground floors and public spaces. The aim is to develop strategies that improve walkability, usability and environmental comfort along urban corridors such as Heweliusza Street.
- 2) Understanding how digital technologies can support the analysis, design and communication of outdoor comfort. Using environmental simulations, digital mapping, 3D models and virtual environments, students will visualise comfort conditions in different spatial and temporal scenarios, including daily and seasonal changes, to inform design-oriented solutions.
- 3) Responding to key questions about lived experience, spatial performance and future potential. Students will consider how surrounding buildings influence outdoor comfort requirements and how urban spaces can evolve to offer better environmental quality through a multidisciplinary, collaborative approach.



The course trains students to observe, measure, simulate, and communicate current outdoor comfort conditions, linking on-site evidence with digital analysis to reveal issues and unrealized potential in contemporary urban spaces.

Learning outcome

By the end of the course, students will be able to:

- Understand key microclimatic and spatial factors affecting outdoor comfort.
- Use digital tools to analyze and visualize comfort conditions.
- Evaluate contemporary urban spaces with high functional intensity.
- Develop design-oriented strategies to improve public space comfort.
- Apply acquired skills to real urban contexts such as Heweliusza Street.

Block course: online lectures (Fridays) 20.03.2026 and from 10.04, 17.04, 24.04. 2026 + regular workshop (from 4.05 – 25.5 2026 – Fridays+ additional days according to the individual plan) in Gdansk (group of max 15 students)

The course is structured to be done in format: March/April: Online – 3 h/week (Fridays) May: In presence – regular workshop days

- **Teaching modes:** Lectures, seminars, guided exercises, site visits
- **Tools:** QGIS + UMEP, RayMan, Climate Consultant, SketchUp + SunHours
- **Case study:** Existing outdoor comfort conditions of Heweliusza Street, Gdańsk

BLOCK 1 – Outdoor Comfort & Urban Climate Foundations

April (Online) – 12 hours

Week 1

- Lecture: Outdoor comfort in contemporary urban design
- Seminar: Urban climate and public space in Baltic cities
- Introduction to Heweliusza Street and analytical framework

Week 2

- Lecture: Microclimatic parameters (air temperature, radiation, wind, MRT, PET)
- Exercise: Climate Consultant – analysis of current climate data for Gdańsk

Week 3

- Lecture: Urban morphology, materials, and microclimate interactions
- Exercise: RayMan – baseline outdoor comfort assessment (existing situation)

Week 4

- Seminar: Comfort perception, walkability, and everyday use
- Exercise: Functional and spatial mapping of Heweliusza Street (QGIS)

BLOCK 2 – Field Observation & Digital Assessment

May (In presence)

Week 1

- **Site Visit 1:** Morning observation of Heweliusza Street o Microclimate perception, pedestrian flows, shadow conditions
- **Site Visit 2:** Afternoon observation of Heweliusza Street o Thermal comfort, wind exposure, use of public space □ Lectures: Outdoor comfort in office- and mixed-use districts
- Exercises: o QGIS + UMEP: heat stress, shading, and radiation mapping o Wind exposure analysis
- Seminar: Comparing on-site observations with digital simulations

Week 1

- Lecture: Solar exposure, shading, and surface materials
- Exercise: SketchUp + SunHours – analysis of existing solar access

Week 2

- Seminar: Ground-floor activities and comfort needs
- Exercise: RayMan – comfort comparison across times of day and seasons (current climate)

Week 2

- Workshop: Identification of critical comfort issues and latent spatial potential
- Mid-review: Presentation and discussion of analytical results

BLOCK 3 – Synthesis, Interpretation & Communication

May (In presence)

Week 3

- Lecture: Integrating field observations and simulation outputs
- Exercise: Cross-tool synthesis (QGIS, RayMan, UMEP)



Week 3

- Seminar: Evidence-based interpretation of outdoor comfort issues
- Exercise: Mapping discomfort zones and underused spaces

Week 4

- Workshop: Visual communication of outdoor comfort analysis
 - o Maps, diagrams, 3D views

Week 4

- Final presentation: Comprehensive assessment of existing outdoor comfort on Heweliusza Street
- Course wrap-up and feedback

Methods:

The course combines theoretical input, field observation, and hands-on digital analysis, structured around lectures, seminars, site visits, and guided exercises. The didactic approach emphasizes the integration of qualitative on-site evidence and quantitative digital tools, fostering critical interpretation of existing urban conditions rather than speculative design. The case study of Heweliusza Street in Gdańsk serves as a continuous reference throughout the course. The course includes:

Field visits and on-site observations: Two guided visits to Heweliusza Street are organized during the first week of May. These visits include open-air lectures and structured fieldwork aimed at observing microclimatic conditions, pedestrian behavior, shading, wind exposure, and patterns of everyday use. Direct engagement with the site supports the understanding of spatial qualities, comfort issues, and latent potential, and provides ground-truth data for subsequent digital analyses.

Laboratory and digital exercises: Hands-on exercises are carried out using digital tools such as QGIS + UMEP, RayMan, Climate Consultant, and SketchUp + SunHours. These activities develop technical skills, teamwork, and problem-solving abilities related to climate data processing, spatial mapping, and comfort assessment. Laboratory work focuses on post-processing, interpretation, and visualization of results derived from the existing conditions of the case study.

Lectures and seminars: Lectures introduce theoretical frameworks, methods, and current research on outdoor comfort, urban climate, and high-intensity mixed-use environments. Seminars support discussion, critical reflection, and comparison between field observations and simulation outputs, strengthening analytical and interpretative skills.

Workshops and collective reviews: Workshops are used to present methodologies, intermediate results, and analytical syntheses. Collective reviews encourage shared learning, alignment of approaches, and the development of a common analytical language regarding outdoor comfort assessment.

Online collaboration and knowledge exchange: Online sessions and shared digital platforms support collaborative work, exchange of materials, and continuous feedback, ensuring methodological coherence across different phases of the course and enabling students to consolidate transferable analytical practices for future applications.

Learning Outcomes:

The course on outdoor comfort enables students to significantly enhance their analytical, logical, critical thinking and creative problem-solving skills in the field of sustainable urban design. Focus is given to design approaches that address environmental comfort while preserving and enriching the cultural, architectural and economic characteristics of urban spaces.

Students learn to: Identify and interpret references to urban heritage embedded in contemporary street design, public space layouts, materials, and microclimatic strategies, understanding how historical urban structures influence present-day outdoor comfort. Practice digital documentation and analysis of historically layered urban spaces, using mapping, environmental simulations, and 3D information models to support climate-sensitive design, spatial optimization, and long-term urban management of heritage areas such as Heweliusza Street.

Understand and solve design problems related to outdoor comfort—thermal, acoustic, and social—within the context of culturally significant urban environments, balancing climate adaptation, public use, and heritage preservation.

The course enables students to recognize and critically assess challenges, conflicts, and design concepts that emerge when improving outdoor comfort in urban areas.

Prerequisites: Great willingness for multidisciplinary approaches, openness for research based, innovative sustainable design, advanced skills in using digital tools and ability of working in a digital environment

Assessment Methods and Criteria: Evaluation of the final study and task.

Study Materials: Reading List, excerpts of lectures, definitions etc. will be provided to students in digital format with respect to the topic of the seminars.