

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                                          |            |     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|--------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | New technologies for cities, PG_00210505                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                                          |            |     |
| Field of study                              | Spatial Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          |                                         |                                     |                                                                          |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                                                |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>Optional subject group |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Mode of delivery                        |                                     | at the university                                                        |            |     |
| Year of study                               | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Language of instruction                 |                                     | Polish                                                                   |            |     |
| Semester of study                           | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | ECTS credits                            |                                     | 2.0                                                                      |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | Assessment form                         |                                     | credit                                                                   |            |     |
| Conducting unit                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                                          |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | dr Hanna Obracht-Prondzyńska            |                                     |                                                                          |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                                          |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                  | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 30.0                                                     | 0.0                                     | 0.0                                 | 0.0                                                                      | 0.0        | 30  |
|                                             | E-learning hours included: 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                         |                                     |                                                                          |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Participation in didactic classes included in study plan |                                         | Participation in consultation hours |                                                                          | Self-study | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 30                                                       |                                         | 0.0                                 |                                                                          | 20.0       | 50  |
| Subject objectives                          | <p>The aim of the course is to introduce students to the role of emerging technologies, Big Data, and artificial intelligence in the analysis, planning, and management of contemporary cities. The course develops students' ability to critically assess the opportunities and limitations of digital tools and their application in addressing complex urban challenges, particularly those related to climate change, quality of life, health, public participation, and sustainable development.</p> <p>The course also aims to develop design and teamwork skills through the application of design thinking methods to create a concept for a mobile application that engages residents in addressing urban issues. Students will become familiar with the process of identifying problems and user needs, generating ideas, prototyping, testing, and presenting a solution. The course combines theoretical knowledge with the practical application of technology to support more inclusive, responsive, and evidence-based urban planning.</p> |                                                          |                                         |                                     |                                                                          |            |     |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Method of verification                                                            |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | The student understands the role of Big Data, artificial intelligence, and emerging technologies in the analysis, planning, and management of cities. They are familiar with the potential applications of digital tools in climate change monitoring, improving quality of life, supporting public participation, and urban planning decision-making. They are able to critically assess the opportunities and limitations of technology, identify an urban challenge, and propose an appropriate digital solution. The student applies basic design thinking methods to develop, prototype, and test a mobile application concept. They are able to work in a team, consider user needs, incorporate feedback, and clearly present and justify the proposed solution. | [SW5] implementation of a problem task<br>[SK2] presentation/project/paper/report |
| Subject contents                | <p>Theoretical Part</p> <ol style="list-style-type: none"> <li><b>1. Introduction to Data-Driven Urbanism.</b> The role of emerging technologies in urban planning and management. Big Data, artificial intelligence, and new sources of urban data. Opportunities and limitations of the data-driven urbanism approach.</li> <li><b>2. Artificial Intelligence and Big Data in Research on Health and Quality of Life in Urban Space.</b> The use of spatial data, social media, and analytical tools to explore relationships between the urban environment, residents' behaviour, and mental health.</li> <li><b>3. Predictive Tools and Artificial Intelligence in Urban Climate Change Monitoring.</b> The application of data and analytical models to identify climate hazards, monitor environmental phenomena, and support urban diagnostics.</li> <li><b>4. Emerging Technologies for Climate Change Adaptation and Mitigation.</b> Examples of digital tools used to plan adaptation measures, reduce emissions, and support sustainable urban spatial development.</li> <li><b>5. Artificial Intelligence and Data-Driven Tools in Implementing the Degrowth Concept.</b> Opportunities for using technology to manage resources more efficiently, support local systems, and promote alternative models of urban development.</li> <li><b>6. Digital Tools for Participation and Decision-Making.</b> Participatory platforms, social media, and tools supporting dialogue with residents. The role of data and technology in inclusive, transparent, and evidence-based urban governance.</li> <li><b>7. Urban Digital Twins.</b> Basic principles, components, and areas of application of digital twins in the analysis, simulation, planning, and management of urban space.</li> </ol> <p>Workshop Part – Urban Futures Hackathon</p> <ol style="list-style-type: none"> <li><b>1. Problem Identification and Idea Generation.</b> Introduction to design thinking methods. Identifying urban challenges and user needs. Brainstorming, the Crazy 8s exercise, and selecting a mobile application concept.</li> <li><b>2. User Scenarios and Application Architecture.</b> Developing a user journey map, defining the application's core features, and preparing a storyboard illustrating how users interact with the proposed solution.</li> <li><b>3. Concept Prototyping.</b> Creating low-fidelity prototypes, including paper mock-ups or simple digital mock-ups. Assigning team roles and developing the user interface concept.</li> <li><b>4. Testing and Refining the Solution.</b> Peer testing of prototypes, collecting feedback, identifying strengths and weaknesses, and introducing improvements to the concept.</li> <li><b>5. Final Project Development and Presentation.</b> Preparing a B2 poster presenting the mobile application concept, its target users, core features, functionality, and potential contribution to addressing the selected urban challenge. Presentation and discussion of team projects.</li> </ol> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |
| Prerequisites and co-requisites | <p>Basic knowledge of urbanism, spatial planning, or the functioning of cities is required, enabling students to identify and analyse urban challenges. Computer literacy, the ability to search for and critically evaluate information, and basic familiarity with tools for preparing presentations and graphic materials are useful.</p> <p>No prior knowledge of programming or advanced data analysis methods is required. Students are expected to be open to teamwork, creative problem-solving, and independently exploring new digital tools.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Percentage of the final grade                                                     |
|                                 | B2 poster presenting the concept                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 20.0%                                                                             |
|                                 | Project presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10.0%                                                                             |
|                                 | Class participation and teamwork                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10.0%                                                                             |
|                                 | Mobile application concept                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60.0%                                                                             |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>1. Batty, M. (2013). The new science of cities. MIT Press. <a href="https://doi.org/10.7551/mitpress/9399.001.0001">https://doi.org/10.7551/mitpress/9399.001.0001</a></p> <p>1. Kitchin, R. (2014). The data revolution: Big data, open data, data infrastructures and their consequences. SAGE Publications.</p> <p>1. Kitchin, R. (2021). The data-driven city. W W. H. K. Lam, D. W. Lee &amp; J. N. M. Chiu (red.), The Routledge handbook of smart cities (s. 52–68). Routledge.</p> <p>1. Goodspeed, R. (2020). Scenario planning for cities and regions: Managing and envisioning uncertain futures. Lincoln Institute of Land Policy.</p> <p>1. Brown, T. (2009). Change by design: How design thinking transforms organizations and inspires innovation. HarperBusiness.</p>                                                                                                                                                                                                                                                                                                 |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>1. Kitchin, R. (2016). The ethics of smart cities and urban science. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 374(2083), 20160115. <a href="https://doi.org/10.1098/rsta.2016.0115">https://doi.org/10.1098/rsta.2016.0115</a></p> <p>1. Batty, M. (2018). Digital twins. Environment and Planning B: Urban Analytics and City Science, 45(5), 817–820. <a href="https://doi.org/10.1177/2399808318796416">https://doi.org/10.1177/2399808318796416</a></p> <p>1. Cardullo, P., &amp; Kitchin, R. (2019). Smart urbanism and smart citizenship: The neoliberal logic of 'citizen-focused' smart cities in Europe. Environment and Planning C: Politics and Space, 37(5), 813–830. <a href="https://doi.org/10.1177/0263774X18806508">https://doi.org/10.1177/0263774X18806508</a></p> <p>1. Gehl, J. (2010). Cities for people. Island Press.</p> <p>1. IDEO.org. (2015). The field guide to human-centered design. IDEO.org. <a href="https://www.designkit.org/resources/1">https://www.designkit.org/resources/1</a></p> |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Example issues/<br>example questions/<br>tasks being completed | <ul style="list-style-type: none"> <li>• How are Big Data and artificial intelligence changing the way cities are analysed, planned, and managed?</li> <li>• What opportunities and limitations are associated with the use of spatial data, social media, and digital tools in urban research?</li> <li>• How can emerging technologies support climate change monitoring, adaptation, and mitigation in cities?</li> <li>• How can artificial intelligence and analytical tools be used to study residents' quality of life and mental health?</li> <li>• What is an urban digital twin, and how can it be applied in spatial planning?</li> <li>• Which digital tools can support public participation and urban planning decision-making?</li> <li>• How can urban technologies be designed to address the needs of different user groups while ensuring inclusivity and responsible data use?</li> <li>• Identifying a selected urban challenge and developing a mobile application concept that engages residents in addressing it.</li> <li>• Applying design thinking methods, including brainstorming, the Crazy 8s exercise, user journey mapping, and storyboarding.</li> <li>• Developing a low-fidelity application prototype, conducting peer testing, and introducing improvements based on feedback.</li> <li>• Preparing a B2 poster presenting the application concept, followed by a team presentation and justification of the proposed solution.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Document generated electronically. Does not require a seal or signature.