Urban Systems, Real Estate, and Construction Management 2	
Offered by	Department of the Built Environment, unit Urban Systems and Real Estate
Language	English
Primarily interesting for	All students, but most relevant for students with interest in the USRE and SUMT tracks in the Architecture, Building and Planning (ABP) program and the Construction Management and Engineering (CME) program.
Required courses: none	Required courses: none Recommended courses: none
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Content and composition

Just as the elective package 'Urban Systems, Real Estate, and Construction Management 1', this elective package focuses on the built environment and the people living in it. However, the USRECM2 elective package concentrates on modeling and predicting effects of trends, developments, and changes in the urban system, which includes the built environment and the behavior of individuals, households, and institutions in this environment.

Predicting the urban future is complex. It needs to model the urban environment and how people behave in the urban environment. Modeling/representing the urban environment is the main subject of the first course. It is about storing, analyzing, mapping, and visualizing spatial data in 2D and 3D. Recent technologies to collect (large sets of) spatial data will be dealt with as well.

The course in mobility introduces the students to the transportation of people. It considers people moving from origins to destinations. Due to modern information and communication technologies, activities performed by persons and institutions will change, including the location of these activities. Changes in transportation technology will affect the transportation system as well.

New technologies will not only affect the transportation system but the entire urban environment. Life in cities will change substantially. Aging, climate change and other developments will cause buildings, infrastructure, and public spaces to be used differently. The increasing need for energy-neutral buildings and cities will change the city as well. This offers real challenges for urban planners, developers, and managers. Effects of various developments will be investigated by means of simulation in the Smart Cities project.

The courses prepare the student for the Urban Systems & Real Estate track, the Sustainable Urban Mobility Transitions track and for the master's program Construction Management and Engineering.

Course code	Course name	Level classification	Last year course is offered	Last year exam is offered
7U8X0	Geographic Modeling of the Built Environment	1	2023-2024	2024-2025
7W3X0	Mobility	2	n.a.	n.a.
7M6X0	Project Smart Cities	3	n.a.	n.a.

Course description

7U8X0 Geographic Modeling of the Built Environment

The core of this course consists of Geographic Information Systems (GIS). Geographic Information Systems are used to store and prepare location-related data, create thematic maps, and perform spatial analyses, for example, concerning the accessibility of service locations or public transport networks. In addition, Geographic Information Systems are used to analyze energy use, urban climate (heat islands), and real estate value. Software will be applied at different spatial scales. Due to new technologies, large sets of spatial data become available. This makes Geographical Information Systems and City Modeling even more important.

7W3X0 Mobility & Logistics

This course is an introduction to the field of mobility. Basic concepts and state-of-the-art techniques to understand and model personal mobility are taught. Activity-based models, supernetwork models, and discrete choice models are introduced by which travel flows and resulting mobility patterns can be modeled and predicted. Related mobility concepts are discussed and analyzed. Basic principles of transportation will be taught, and associated models will be presented.

7M6X0 Project Smart Cities

The project starts by exploring trends possibly affecting the urban system including the use, functioning, management, and manifestation of the city. Amongst others, demographic, technological, climatic, and societal trends will be dealt with. Some of these trends and their possible effects on (life in) cities have to be described. These trends will be used to generate a number of scenarios which will be explored given an existing or fictive urban environment by means of simulation software (Netlogo). Conclusions regarding future (smart) urban development will be drawn.