

University of Debrecen  
Faculty of Engineering

## Urban Systems Engineering MSc Program

2019

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## DEAN'S WELCOME

Welcome to the Faculty of Engineering!

This is an exciting time for you, and I encourage you to take advantage of all that the Faculty of Engineering UD offers you during your bachelor's or master's studies. I hope that your time here will be both academically productive and personally rewarding. Think creatively and be confident.

The Faculty of Engineering of the University of Debrecen is at the forefront of the education and training of engineers in the North-Great-Plain Region of Hungary. It is a dynamically developing Faculty with over 3000 students and a highly-qualified and enthusiastic teaching staff of about 80 members. In order to optimize the quality of training the Faculty continuously strives to expand the number of industry and educational partners at home and abroad.

The Faculty was awarded the Quality Prize in 2011 by the Ministry of Education in recognition of its efforts in this field.

I wish you every success in your studies and hope to meet you personally in the near future.

With best wishes

Edit Szűcs

Dean

## HISTORY OF THE UNIVERSITY

The history of Debrecen's higher education dates back to the 16<sup>th</sup> century. The Calvinist Reformed College, established in 1538, played a central role in education, teaching in the native language and spreading Hungarian culture in the region as well as in the whole country. The College was a sound base for the Hungarian Royal University, founded in 1912. Apart from the three academic faculties (arts, law, theology) a new faculty, the Faculty of Medicine was established, and the University soon became one of the regional citadels of Hungarian higher education. Today, University of Debrecen is classified as "University of National Excellence" and offers the highest number of academic programs in the country, therefore it is considered to be one of the best universities in Hungary. Its reputation is the result of its quality training, research activities and the numerous training programs in different fields of science and engineering in English. With 14 faculties and a student body of almost 30.000, out of which about 3700 are international students, the University of Debrecen is one of the largest higher education institutions in Hungary.

The history of the Faculty of Engineering dates back to 1965, when the Technical College was established. In 1972 it was renamed Ybl Miklós Polytechnic and in 1995 it became part of Kossuth Lajos University. In 2000 the Faculty of Engineering became part of the integrated University of Debrecen.

In 2005 the Bologna System was introduced which supports the competitiveness of qualifications received at the University of Debrecen against universities all over Europe.

The Faculty of Engineering is practice-oriented and develops skills required for the current needs of the national and international labour market. The teaching staff is involved in numerous domestic and international research and design projects. The recently-opened new building wing with its ultra-modern design hosts several lecture halls, seminar rooms and laboratories equipped with the latest technology. Our students are provided with practical knowledge, training and field practice from numerous prestigious domestic and multi-national industry partners. The internship periods are excellent opportunities for students to experience how theory is put into practice at the most renowned industry representatives and become more successful in the labour market of this highly competitive sector. Students learn how to work in the working environment of multi-national companies and adapt to challenges easily. After graduation they will be able to work at a strategic decision-making level, giving priority to efficiency and engineering ethics.

The Faculty of Engineering offers a great variety of BSc, MSc courses and post-graduate training courses tailored to the needs of the rapidly changing world of engineering and focusing on European and international trends. In 2011 the Faculty of Engineering launched engineering trainings in English. In order to optimize the quality of training, the Faculty continuously strives to expand the number of industrial and educational partners at home and abroad.

The Faculty of Engineering has been a pioneer in the introduction of Quality Management System at faculty level to measure and evaluate the efficiency of its education and

teaching staff in order to improve the quality of education and training from the feedback received.

The Faculty of Engineering has a vivid student life. There is a film club waiting for movie buffs and the door of the Faculty library is always open. The library is not only the host to the latest technical books, exhibitions and tea afternoons with invited speakers, but students can also purchase theatre and concert tickets from the librarians. The Borsos József Dormitory is also a hub of activities for students.

The increasing number of international students brings cultural and ethnic diversity to the faculty.

Our aim is to aid students to become efficient members of the labour market and enrich the world of engineering in Hungary and abroad with their knowledge and expertise.

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The Coordinating Center for International Education supports the international degree programmes of the University of Debrecen in giving new students information on admission and entrance exam. It has tasks in promoting and is in charge of tasks like enrolment, study contracts, modifying student status or degree programme, activating student status, modifying students' personal data, requesting and updating student cards, providing certificates for the Immigration Office (for residence permit), issuing student status letters and certificates on credit recognition, concluding health insurance contract and providing Health Insurance Card, helping students with visa process application.

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## ACADEMIC CALENDAR

General structure of the academic year:

Study period	1 <sup>st</sup> week	Registration*	1 week
	2 <sup>nd</sup> – 7 <sup>th</sup> week	Teaching Block 1	6 weeks
	8 <sup>th</sup> week	1 <sup>st</sup> Drawing Week	1 week
	9 <sup>th</sup> – 14 <sup>th</sup> week	Teaching Block 2	6 weeks
	15 <sup>th</sup> week	2 <sup>nd</sup> Drawing Week	1 week
Exam period	directly after the study period	Exams	7 weeks

\*Usually, registration is scheduled for the first week of September in the fall semester, and for the first week of February in the spring semester.

### ACADEMIC CALENDAR OF THE FACULTY OF ENGINEERING 2019/2020

<b>Opening ceremony of the academic year</b>	8 September 2019 (Sunday)
Registration week	2-6 September 2019
Revision week (exams in Exam courses may be scheduled during this week)	2-6 September 2019
<b>1<sup>st</sup> semester study period in MSc and BSc programs</b>	9 September 2019 - 13 December 2019 (14 weeks) In case of finalist courses: 9 September 2019 - 8 November 2019 (9 weeks)
<b>Career Days – “Industry Days in Debrecen 2019”</b> (working days without teaching for Mechanical Eng. BSc, Mechanical Eng. MSc, Environmental Eng. MSc, Mechatronic Eng. BSc, Mechatronic Eng. MSc, Civil Eng. BSc students)	10-11 October 2019

<p><i>7<sup>th</sup> ISCAME (International Scientific Conference on Advances in Mechanical Engineering)</i></p> <p><i>VII. Exhibition on Mechanical Engineering</i></p> <p>(organised by the Department of Mechanical Engineering)</p>	10-11 October 2019
<p><i>Career Days in Environmental Engineering</i></p> <p>(organised by the Department of Environmental Engineering)</p>	10-11 October 2019
<p><i>Career Days in Mechatronics (exhibition, company presentations)</i></p> <p>(organised by the Department of Mechatronics)</p>	10-11 October 2019
<p>“Árkádia” Conference (organised by the Department of Architectural Engineering)</p>	10-11 October 2019
<p>“Problem-Based Learning in Engineering Education” Conference (organised by the Department of Basic Technical Studies)</p>	10-11 October 2019
<p><b>Faculty Conference of Scientific Students’ Association</b></p>	22 October 2019
<p><i>Career Days in Civil Engineering</i></p> <p>(organised by the Department of Civil Engineering)</p>	6-8 November 2019
<p>Reporting period I (Drawing week I)</p>	<p>21 - 25 October 2019</p> <p>(5 working days without scheduled lessons, consultation schedule announced previously)</p>
<p>Reporting period II (Drawing week II)</p>	9-13 December 2019

	(5 working days without scheduled lessons, consultation schedule announced previously)
<b>1<sup>st</sup> semester examination period</b>	16 December 2019 - 31 January 2020 (7 weeks) In case of finalist courses: 11 November - 13 December 2019 (5 weeks)
Thesis (BSc, MSc) submission deadline	As defined by the departments; max. 14 days of the beginning of the final examination period.
Final examination period	As defined by the departments; at least one occasion between 16 December 2019 and 31 January 2020. The departments shall announce the date of the final examination until 15 September 2019.
Registration week	3 - 7 February 2020
<b>2<sup>nd</sup> semester study period in MSc and BSc programs</b>	10 February - 15 May 2020 (14 weeks) In case of finalist courses: 10 February - 10 April 2020 (9 weeks)
<b>Conferences</b>	
<i>Career Days in Civil Engineering</i> (organised by the Department of Civil Engineering)	7-8 May 2020
International conference entitle " <i>Electrical Engineering and Mechatronics Conference EEMC'20</i> " (organised by the Department of Mechatronics)	7-8 May 2020
<i>Career Days in and Exhibition on Building Services Engineering</i>	7-8 May 2020
Reporting period I (Drawing week I)	23 - 27 March 2020



	(5 working days without scheduled lessons, consultation schedule announced previously)
Reporting period II (Drawing week II)	11 – 15 May 2020 (5 working days without scheduled lessons, consultation schedule announced previously).
<b>2<sup>nd</sup> semester examination period</b>	18 May - 3 July 2020 (7 weeks) In case of finalist courses: 13 April - 15 May 2020 (5 weeks)
Thesis (BSc, MSc) submission deadline	As defined by the departments; max. 14 days of the beginning of the final examination period.
Final examination period	As defined by the departments; at least one occasion between 11 May 2020 and 26 June 2020. The departments shall announce the date of the final examination until 15 February 2020.

## THE URBAN SYSTEMS ENGINEERING MASTER PROGRAM

### INFORMATIONS ABOUT THE PROGRAM

Name of master's program:	Urban Systems Engineering Master's Program
Specializations available:	-
Field, branch:	engineering
Level:	graduate
Qualification:	Urban System Engineer
Mode of attendance:	Full-time
Faculty:	Faculty of Engineering
Program coordinator:	Dr. György Csomós, college professor
Program length:	4 semesters
Credits total:	120

#### **Objectives of the undergraduate program, competences to be acquired:**

The objective of the program is to train urban system engineers who are able to provide and control activities of urban planning, settlement architecture, principal architecture and technical authorities, administrations and the communal, maintenance, organizational, services, environmental and the protection of urban built environment of local governments. Urban systems engineers are prepared at a high level to implement the concepts and programs of urban development and to make design them. They are able to synchronise the development of settlements, groups of settlements and areas to make spatial plans, to manage and control such activities, and to make scientific research of the professional field. The program also functions as preparation for students interested in doing a PhD.

#### **Professional competences to be acquired**

##### **An urban systems engineer**

##### ***a) Knowledge***

- knows contemporary theory and practice of urban planning, the interrelationship of theory and practice.

- has acquired the basic knowledge of architecture, engineering, ecology, environmental science, sociology, economy, law and administration.
- is able to interpret and assess maps, plans and technical drawings, the techniques of visualization.
- knows the methods and tools of coordinating and carrying out regional and rural development programs.
- knows complex natural and cultural environmental systems, the latest results, outcomes of the professional field.
- has acquired the knowledge of computer communication, data management and data analysis.
- knows graphic systems (CAD, GIS) and their application in regional and rural planning.
- knows the fundamental principles of environment protection, quality management, consumer protection, product liability, the principles and application of equal access, workplace health and safety, legal regulations of engineering and economy and engineering ethics.
- knows the widely applicable problem solving techniques in research and scientific work.
- knows the characteristics of global social and economic processes that influence urban development and settlement.

***b) Abilities***

- is able to apply the acquired knowledge and problem solving techniques in practice.
- is able to apply the acquired professional knowledge of the discipline to elaborate new problems and phenomena originates from the lack of experience.
- is able to form, if possible, an accurate judgement or opinion on problems of urban development and to make conclusions.
- is able to design and carry out tasks of settlement and construction at a high professional level.
- is able to manage resources of engineering, as well as economy and human resources.
- is able to provide urban and regional development tasks as a result of his/her system approach and process-oriented thinking.
- is able to apply integrated social, economic, environmental knowledge in the fields of urban settlement, urban development and regional planning.
- is able to make investigations, analyses and structural and regulatory plans involving engineers of different professional branches and aiming at the arrangement of settlements and groups of settlements.
- is able to assess plans of urban development and operations, to analyse them critically and, based on this, to perform the tasks of an urban system architect, a chief architect and tasks of technical authorities, administration.
- is able to organize, synchronise, coordinate and manage the activities of a planning team, to recognize the systems of settlement operation and the links and modes of action of its processes, and to assess and manage them in a system approach.

- He/she is able to apply procedures, models, information technologies used in urban planning, operation and administration.

#### **c) Attitude**

- endeavours to acquire developed spatial vision and appropriate visual expression.
- endeavours to solve problems originated by different interests in settlement development and to make decisions that serve public interest.
- is open to cooperate, communicate and negotiate in professional processes.
- endeavours to analyse and make synthesis assessment of the elements related to the built environment.
- is open to participate in comprehensive work of different professional fields, to manage and coordinate team work.
- endeavours to enforce the requirements of energy efficiency and maintenance.
- endeavours to work in a complex manner based on a system approach and a process oriented way of thinking.
- examines the possible researches, developments and innovations and endeavours to fulfil them during his/her work.
- is open to participate in professional trainings that convey up-to-date knowledge.

#### **d) Autonomy and responsibility**

- having spent enough time in the profession he/she can manage drawing up plans on settlement development and organization.
- acts proactively and independently when professional problems related to territorial and settlement planning need to be solved.
- has responsibility for sustainable and environmentally aware settlement development.
- makes and takes responsibility for decisions on settlement development and organization, and constructions independently and prudentially consulting with representatives of the relevant areas of expertise (primarily legal, economic, energetic and environmental fields).
- when making a decision, he/she considers environment protection, quality management, consumer protection, product liability, the principle of equal access and application, health and safety at work, engineering, economic and legal regulations, and meets the standards of engineering ethics.

## COMPLETION OF THE ACADEMIC PROGRAM

### The Credit System

Majors in the Hungarian Education System have generally been instituted and ruled by the Act of Parliament under the Higher Education Act. The higher education system meets the qualifications of the Bologna Process that defines the qualifications in terms of learning outcomes: statements of what students know and can do on completing their degrees. In describing the cycles, the framework uses the European Credit Transfer and Accumulation System (ECTS).

ECTS was developed as an instrument of improving academic recognition throughout the European Universities by means of effective and general mechanisms. ECTS serves as a model of academic recognition, as it provides greater transparency of study programs and student achievement. ECTS in no way regulates the content, structure and/or equivalence of study programs.

Regarding each major the Higher Education Act prescribes which professional fields define a certain training program. It contains the proportion of the subject groups: natural sciences, economics and humanities, profession-related subjects and differentiated field-specific subjects.

The following professional fields define the training program of the **Urban Systems Engineering MSc**:

- Natural sciences: 5 credits;
- Economics and humanities: 5-10 credits;
- Knowledge on design (regional planning, urban planning, architecture, urban infrastructure, transportation, public works, urban environment protection, built heritage protection): 70-80 credits.

Minimum of credit points assigned to optional subjects: 6

Credit points assigned to thesis: 30

Credits total: 120

During the program students have to complete a total amount of 120 credit points. It means approximately 30 credits per semester. The curriculum contains the list of subjects (with credit points) and the recommended order of completing them, which takes into account the prerequisite(s) of each subject. You can find the recommended list of subjects/semesters in chapter "Guideline".

## Guideline (List of Subjects/Semesters)

The total number of credit points (120) of the training program can be obtained by completing the subjects of the curriculum. There is a certain degree of freedom in the order students can complete the subjects. However, it is recommended that the suggested order be followed because some subjects can only be taken after the completion of the prerequisite subject(s), and/or can be the prerequisites for other subjects.

The list of subjects to complete in the semesters according to the model curriculum of Urban Systems Engineering MSc program:

<b>1<sup>st</sup> semester</b>	<b>2<sup>nd</sup> semester</b>
Geographic Information Systems (GIS)	Urban Transportation Planning II
Urban Morphology	Public Works I
Urbanization	Greenfield Management
Urban Transportation Planning I	Ecological Planning
Urban Environmental Protection	Urban Planning I
Urban Renewal Processes	City Operations
Urban Design	Municipal Administration
Real Estate Development and Management	
<b>3<sup>rd</sup> semester</b>	<b>4<sup>th</sup> semester</b>
Public Works II	Preparation of the Thesis
Urban Artifacts	
Strategic Environmental Assessment	
Urban Waste Management	
Urban Planning II	
Built Heritage Protection	
Optional Course I	
Optional Course II	

About the prerequisites of each subject please read the chapter “Course Descriptions”!

## Work and Fire Safety Course

According to the Rules and Regulations of University of Debrecen students must complete the online course for work and fire safety. Registration for the course and its completion are necessary for graduation. For MSc students the course is only necessary if their BSc diploma has not been awarded by the University of Debrecen.

Registration in the Neptun system by the subject: MUNKAVEDELEM

Students have to watch/read an online material to get the signature on Neptun for the completion of the course. The link of the online course is available on the website of the Faculty.

## Internship

Students majoring in the Urban Systems Engineering MSc have to do a four-week-long internship as described in the model curriculum. The internship course must be registered for previously via the NEPTUN system in the spring semester (2<sup>th</sup> semester). Its completion is required for getting the pre-degree certificate (absolutorium).

### *Objective of the internship, competences*

Students get acquainted with professional work in conformity with their major at a company or institution and join in their daily working process. They have to resolve tasks independently assigned by their supervisor and gain experiences that may be used later in the labour market. During the internship, common and professional competences may be acquired. Common competences: precise working on schedule either individually or in team, ability to communicate applying correct terminology. Professional competences: applying the professional skills gained during the training and acquiring new knowledge.

### *Places suitable for internship*

All the organizations, institutions and companies in Hungary or abroad are suitable which can provide students with the opportunity to acquire proficiency in accordance with their specialization in the field of operation, repairing technology, installation, management and development of different machines and vehicles, may be a suitable place.

All the necessary formal documents can be downloaded from the website of the Faculty of Engineering: [www.eng.unideb.hu/en](http://www.eng.unideb.hu/en) (For Current Students/Graduate Programs in English /Urban Systems Engineering MSc/Internship)

### Physical Education

According to the Rules and Regulations of University of Debrecen students must complete Physical Education course at least in one semester during his/her Master's training. Our University offers a wide range of facilities to complete them. Further information is available from the Sport Centre of the University, its website: <http://sports.unideb.hu>.

### Optional (elective) courses

According to the Rules and Regulations of University of Debrecen students must complete elective courses during their MSc studies. These elective courses are opened by the Departments at the Faculty of Engineering at the beginning of the actual semester. Students can also select optional courses offered by other faculties of University of Debrecen to complete but these courses are accepted as 3 credits maximum. Optional subjects can be completed in any semester and with any number of subjects.

Please note that courses completed on Erasmus scholarship often can be transferred as elective subjects into your curriculum.

In the Urban Systems Engineering MSc program, one must gain at least 6 credits by completing elective subjects.

### Pre-degree Certification

A pre-degree certificate is issued by the Faculty after completion of the master's (MSc) program. The pre-degree certificate can be issued if a student has successfully completed the study and exam requirements as set out in the curriculum, the requirements related to Physical Education as set out in Section 10 in Rules and Regulations, internship (mandatory) – with the exception of thesis preparing – and gained the necessary credit points (120). The pre-degree certificate verifies (without any mention of assessment or grades) that the student has fulfilled all the necessary study and exam requirements defined in the curriculum and the requirements for Physical Education. Students who obtained the pre-degree certificate can submit the thesis and take the final exam.



## Thesis

Thesis is the creative elaboration of a professional task (scientific, engineering, design, development, research or research development) in a written form. By solving the task, the student relies on his/her studies using national and international literature under the guidance of an internal and external supervisor (referee). By writing and successfully defending a thesis, students of the Urban Systems Engineering Master program prove that they are able to apply the acquired knowledge in practice, to summarize the work done and its results in a professional way, to solve the tasks related to their topic creatively, and to complete individual professional work.

Students in the master program must write a thesis as a prerequisite of the final exam. Requirements regarding the content of the thesis, the general aspects of evaluation and the number of credits assigned to it are defined based on the requirements of the program. In case of the Urban Systems Engineering Master Program, the number of credits assigned to the thesis is 30.

Thesis topics are announced by the departments no later than the end of the fourth week of the study period of the last but one semester. Students may also offer a topic for the thesis, which the competent head of department may accept or reject. The conditions on the acceptance of a SSS (Student Scientific Society) paper as a degree thesis are defined by the Faculty. SSS papers are supposed to meet the requirements of a thesis both in form and content. Furthermore, it is necessary that the committee of the Pre-SSS make suggestions on the SSS papers to be accepted as theses.

Formal requirements of thesis shall be designated by the Department of Civil Engineering and must be announced in writing together with other thesis-related assignments.

The preparation of a thesis shall be overseen by an internal supervisor approved by the department, and an external supervisor appointed by an industrial partner or local government entities. The rules of thesis writing and partial deadlines designated by the department must be considered.

The thesis submission deadline is defined in the academic calendar of the Faculty (issued by the Vice-Rector for Education) or, failing that, it is 12 a.m. on the 14<sup>th</sup> day before the first day of the final exam. The thesis can be submitted only if both the internal and the external supervisors approve. It is evaluated by an independent external reviewer, and the Head of the Department of Civil Engineering makes a suggestion to the Final Examination Board on its classification based on a five-grade scale.

If the reviewer evaluates the thesis firmly as fail, the student may not take the final exam and must create a new thesis. Students must be informed about it. Conditions on resubmitting the thesis are designated by the head of the relevant educational unit responsible for the major or specialization.

## Final exam

After receiving the pre-degree certificate, students conclude their studies by taking the final exam of Urban Systems Engineering master program. The final exam shall test and assess the knowledge, skills and abilities requisite to the award of the degree, whereby students shall also prove their ability to apply the acquired knowledge in practice. The conditions for taking the final exam and the parts of the final exam itself shall be defined in the requirements for the training program (see entry 'Completion of studies').

The final exam shall be taken in the examination period following the award of the pre-degree certificate in front of a board formed by internal and external (industrial or profession performing) members. If a candidate does not pass the final exam until the termination of his/her student status, that student can sit for the final exam any time after the termination of his/her student status according to the provisions regarding the final exam, effective at the time of taking the final exam.

In the Urban Systems Engineering MSc, the final exam consists of the thesis defence, which is a 15-minute presentation, followed by a 10-minute debate.

### *Evaluation of the final exam*

The oral examination shall be assessed on a five-grade scale by the members of the final examination board. The board shall then consult behind closed doors and vote about the final grade for the final exam. In case of equal division of the votes, the chairperson shall be given the casting vote. The result of the final exam shall be announced by the chairperson of the board. Minutes shall be taken during the final examination. Partial results and the qualification of the degree must be registered in the lecture book too.

### *Repeating a failed Final exam*

If any part of the final exam is evaluated as fail, according to the existing rules of the university, it can be retaken. The retake of the final exam may be attempted in the following examination period at the earliest. If a thesis is evaluated unanimously as fail, the student may not take the final exam and shall write another thesis. The final exam can be retaken twice per each subject.

### *The Final Examination Board*

The Chairman of the Final Examination Board is adjured from the external and internal experts in the field by the Dean with the support of the Faculty council. According to the tradition of the Faculty a vice chairman is appointed too in case he is unable to be present. A Final Examination Board is formed by at least one external (industrial or profession

performing) and two internal members (with a Ph.D. degree). The charge of the Board lasts for one year. The sequence of the candidates is put out by the Registry Office at the Faculty.

## COURSE DESCRIPTIONS FOR URBAN SYSTEMS ENGINEERING MSC

The order of subjects follows the subject list in the model curriculum.

### Subject group “Natural Sciences”

#### **Geographic Information Systems (GIS)**

Code: MK5GEO1S5TX17-EN

ECTS Credit Points: 5

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 0 + 4

#### **Topics:**

GIS tasks of the urban planning procedure. Generation of settlement's spatial information, and realization in GIS environment. Common function of the OPENJump, its structure and appearance. Creating vector database, importing vector data from CAD environment, filling database, generating geometrical objects, editing vector data. Loading raster data. Importing external databases. Joining tables. Thematic map implementation. Integrating the interdisciplinary criteria system (according the URGE project) into a working geographical information system. Spatial and statistical queries according to indicators. Presentation of the results of the queries.

Comparing GIS and CAD applications. Review of an Open JUMP project. Spatial data, vector and raster formats. Attributes. The concept of the sample project. Basic indicators of the project. NDVI, URGE criteria. Building geodatabase, processing data. Queries from own GIS project. Criteria aspect GIS operations. Visualization of the results, charts, cartographic presentations. Discussing of the occurring problems.

The goal of the practice is to train the project approach GIS in a most economical way.

#### **Literature:**

Required:

- Paul A. Longley (2005): Geographical information systems and science, ISBN: 047087001X
- CHRISTOPHER B. JONES (1997): Geographical information systems and computer cartography, ISBN: 0582044391.

- [http://www.tankonyvtar.hu/hu/tartalom/tamop425/0027\\_BGD1/index.html](http://www.tankonyvtar.hu/hu/tartalom/tamop425/0027_BGD1/index.html)
- <http://openjump.org>

Recommended:

- GEORGE F. PINDER (2002): Groundwater modelling using geographical information systems, ISBN: 0471084980

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Practice:</b> Comparing CAM and GIS applications. Various data-sources in GIS. Introduction the OPENJump project.</p> <p><b>4<sup>th</sup> week:</b>  <b>Practice:</b> Setting of objectives of a GIS project. Converting spatial data. CAM inputs. Loading vector data.</p> <p><b>6<sup>th</sup> week:</b>  <b>Practice:</b> Editing, converting geometric data. Quality control of vector data. Topological monitoring.</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Practice:</b> Introduction to OPENJump software. Opening tutorial and sample project tasks. Investigate existing well-working projects.</p> <p><b>5<sup>th</sup> week:</b>  <b>Practice:</b> Processing vector data. Transform and replicate vector data.</p> <p><b>7<sup>th</sup> week:</b>  <b>Practice:</b> Automated and semi-automated data sources. Extract data by geometry type. Extract data by attribute.</p>
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<p><b>9<sup>th</sup> week:</b>  <b>Practice:</b> Loading raster data into the GIS project. Transformations, corrections.</p> <p><b>11<sup>th</sup> week:</b>  <b>Practice:</b> Loading attributes, filling attribute tables. Edit view/attributes.</p> <p><b>13<sup>th</sup> week:</b>  <b>Practice:</b> Statistical analyses, indicators, queries. Possibilities of the Sextante modul.</p>	<p><b>10<sup>th</sup> week:</b>  <b>Practice:</b> Extract geometrical data from raster.</p> <p><b>12<sup>th</sup> week:</b>  <b>Practice:</b> Edit schema, styles.</p> <p><b>14<sup>th</sup> week:</b>  <b>Practice:</b> Project presentations, evaluation of the personal project implementation</p>
<b>15<sup>th</sup> week: 2<sup>nd</sup> drawing week</b>	

## Requirements

### A, for a signature:

Participation at practice is compulsory. Students have to attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up a practice class with another group. Attendance at practice will be recorded by the practice leader. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, which is to be discussed with the tutor. Students are required to bring a USB storage drive to each practice. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct does not meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

Students have to make a GIS project presentation or essay from an existing or an accomplished/working project. If it is correct the student gets a signature.

### B, for a grade:

The course ends with a practical grade.

During the semester the students have to make their own GIS project, and they have to send all of the project files to the leader of the practice at the end of the semester. According to the basic requirements of a GIS, the practice leader evaluate the student's work and offer him/her a practical grade. Evaluating consideration: completeness, integrity, operability, through the viewpoints of the acquainted criteria system.

Students can make up or improve their grades at the last week of the semester.

## Subject group "Social Sciences"

### Urban Morphology

Code: MK5TEL1S02TX17-EN

ECTS Credit Points: 2

Evaluation: exam

Year, Semester: 1<sup>st</sup>, year 1<sup>st</sup> semester

Prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### Topics:

Introduction to urban morphology (UM): different morphological approaches,

morphological schools and the aspects of urban forms. Paths of understanding the town from the urban form (Conzen) to the mental perceiving of the city (Lynch) through the flows (space syntax) with the importance of the history (Caniggia). Typo-Morphology. UM as a generative process: everything is a product of a sociocultural process and the type is a bigger notion than the configuration. Hierarchy and the related disciplines of the UM (history, economics, policies, architecture, geography, transport, planning, aesthetics, sociology, health, philosophy). Urban tissue. Character areas. Morphogenesis (time - form), poly-morphogenesis and the evolution of forms. Different analyses and urban design measures, from the traditional (UM, Typo-Morphology) to the new methods (Spacemate, Morpho) together with pilot methodologies (Morphometrics).

Lectures: interactive + frontal lecture + various tasks at the lectures

Aim (base of the evaluation): At the end of the course, the students will be able to outline the different urban forms and types, urban tissues and make UM analyses and conclude the character of the fabric independently.

### Literature:

#### *Compulsory:*

1. Oliveira, V., 2016. Urban Morphology - An Introduction to the Study of the Physical Form of Cities. Springer. ISBN: 978-3-319-32083-0
2. Kropf, K., 2017. The Handbook of Urban Morphology. Wiley. ISBN: 978-1118747698

#### *Recommended:*

1. Alexander, C., 1978. A Pattern Language: Towns, Buildings, Construction. Center for Environmental Structure, Berkeley.
2. Caniggia, G. - Maffei, G.L., 2001. Architectural composition and building typology: interpreting basic building. Alinea Editrice.
3. Conzen, M.R.G., Conzen, M.P. ed., 2004. Thinking About Urban Form. Papers On Urban Morphology 1932-1998. Peter Lang.
4. Hillier, B. and Hanson, J., 1984. The social logic of space. Cambridge University Press.

### Schedule

#### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** Urban Morphology. Introduction – phenomena.

#### 4<sup>th</sup> week:

**Lecture:** Field trip (joint: Urban Design, Urban Renewal Processes)

#### 3<sup>rd</sup> week:

**Lecture:** Urban Morphology Schools - Approaches.

#### 5<sup>th</sup> week:

**6<sup>th</sup> week:**

**Lecture:** Case Studies. Comparative Studies of Urban Form.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week****9<sup>th</sup> week:**

**Lecture:** Spacemate. Morpho. Morphometrics.

**11<sup>th</sup> week:**

**Lecture:** Case studies – worldwide (presentations by the students – discussion).

**13<sup>th</sup> week:**

**Lecture:** From Theory to Practice. Urban Morphology and Planning.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

**Lecture:** Historico-Geographical Approach. Process Typological Approach. Space Syntax. Spatial Analysis.

**7<sup>th</sup> week:**

**Lecture:** Image of the City. Townscape.

**10<sup>th</sup> week:**

**Lecture:** Practice – Understanding the Urban Form (case studies from the Urban Design Studio).

**12<sup>th</sup> week:**

**Lecture:** Relationships with Other Fields of Knowledge.

**14<sup>th</sup> week:**

**Lecture:** Systematization and discussion. Valorisation and evaluation.

**Requirements****A, for a signature:**

Participation in lectures is compulsory. Students must attend lectures and may not miss more than three lectures during the semester (11+3). In case of further absences, a medical certification or another official certificate from other authorities must be presented. The attendance is recorded by the lecturer. Being late is equivalent to an absence. In case of unofficially justified absence over the 3 allowed, the subject will not be signed (completed) and the student must repeat the course.

**B, for grade:**

The final evaluation takes into consideration the performance at the lectures and the grade at the oral exam.

**Urbanization**

Code: MK5TEL2S4TX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester



Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 3 + 0

### Topics:

Urbanization and urban geography. The origins and growth of cities and urban life. The U.S. urban system and its cities. Urban systems and cities in transition. Urbanization in less developed countries. Urban forms and land use in less developed countries. Urban problems and responses in less developed countries. The process of urban development. How neighborhoods change. The politics of change: urbanization and urban governance. Urban policy and planning. The residential kaleidoscope. The city as text: architecture and urban design. Urbanization, urban life, and urban spaces. Problems of urbanization.

### Literature:

Required:

- Knox, P. L. & McCarthy, L., 2012. Urbanization: An introduction to urban geography. Third Edition. Pearson, London. ISBN 978-0-321-73643-7
- Short, J. R., 1996. The urban order: An introduction to cities, culture, and power. Blackwell, Oxford. ISBN 1-55786-361-X

Recommended:

- Jonas, A. E. G., McCann, E. & Thomas, M., 2015. Urban geography: A critical introduction. Wiley Blackwell, Malden-Oxford. ISBN 978-1-4051-8979-8

### Schedule

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Urbanization and urban geography.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> The origins and growth of cities and urban life.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> The U.S. urban system and its cities.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Urban systems and cities in transition.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Urbanization in the less developed countries.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Urban form and land use in the less developed countries. Urban problems and responses in the less developed countries.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> The urban development process.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> How neighborhoods change.
<b>11<sup>th</sup> week:</b>	<b>12<sup>th</sup> week:</b>

**Lecture:** The politics of change: urbanization and urban governance.

**13<sup>th</sup> week:**

**Lecture:** The residential kaleidoscope. The city as text: architecture and urban design.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

**Lecture:** Urban policy and planning.

**14<sup>th</sup> week:**

**Lecture:** Urbanization, urban life, and urban spaces. Problems of urbanization.

## Requirements

### A, for a signature:

Participation at lectures is compulsory. Students have to attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

### B, for a grade:

An oral exam has to be taken in order to get a grade.

Subject group "Planning Studies"

## Urban Transportation Planning I

Code: MK5KOZ1S4TX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: Yes (Urban Transportation Planning II)

Number of teaching hours/week (lecture + practice): 2 + 2

### Topics:

Characteristics of road transportation. Road networks, categories. Vehicle proceeding in straight and circular sections. Speeds, impedances. Sight distances. Horizontal and vertical alignment, harmonization. Rural and urban intersections, sizing. Multi-level intersections. Implementing of roads. Planning phases. Agricultural roads. Materials of road structures. Flexible and inflexible road structures.

### Literature:

Required:

- W. Kuhn , M.K. Jha: Fundamentals of Road Design (ISBN: 9781845640972)

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Road types, standards, design parameters. <b>Practice:</b> Map, contour lines.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Horizontal and vertical alignment. <b>Practice:</b> Site-plan.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Horizontal and vertical alignment <b>Practice:</b> Long-section.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Junctions. <b>Practice:</b> Long-section.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Junctions. <b>Practice:</b> practicing calculations.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Test. <b>Practice:</b> Test.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Parking. <b>Practice:</b> Typical cross-section.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Accessibility in transportation. <b>Practice:</b> Consultation of homework.
<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Bicycle roads. <b>Practice:</b> Consultation of homework.	<b>12<sup>th</sup> week:</b> <b>Lecture:</b> Materials of road structures. <b>Practice:</b> Materials of road structures.
<b>13<sup>th</sup> week:</b> <b>Lecture:</b> Materials of road structures. <b>Practice:</b> Materials of road structures.	<b>14<sup>th</sup> week:</b> <b>Lecture:</b> Test. <b>Practice:</b> Test.
<b>15<sup>th</sup> week: 2<sup>nd</sup> drawing week</b>	

## Requirements

### A, for a signature:

Participation at **practices** is compulsory. Students have to attend practice classes and may not miss more than three during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. Attendance will be recorded by the practice leader. Being late counts as an absence. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct does not meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

During the semester there is one test, at the end of the semester. A student can retake the test once if necessary. The test is valid if the student reaches 51 out of 100 points. A valid test is the requirement for the signature.

During the semester, there is one homework to be submitted. An accepted homework is a requirement for the signature. The homework is valid if it reaches 51 points out of 100. A valid homework is the requirement for the signature.

### **B, for a grade:**

The course ends in an **examination grade**, based on the points of the tests, the homework and the exam. In the exam, further 200 points can be achieved.

Percent/ Grade: 0-50 % = fail (1); 51-62 % = pass (2); 62-73 % = satisfactory (3); 74-85 % = good (4); 86-100 % = excellent (5)

## **Urban Transportation Planning II**

Code: MK5KOZ2S4TX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): Urban Transportation Planning I

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 2

### **Topics:**

History and role of public transportation in urban development, urban passenger transport modes, vehicle motion and performance, transit system performance, highway transit and bus rapid transit, rail transit and regional rail transit, unconventional transport systems, specialized technology systems, paratransit, characteristics and comparison of transit modes

### **Literature:**

Required:

- Vukan R. Vuchic: Urban Transit; Wiley; Hoboken, New Jersey; 2007

Recommended:

- Gartner, Improta: Urban Traffic networks, Springer, 1995, ISBN 978-3-642-79641-8

- Bell, Kaparias, Mount: Urban Traffic Engineering and Streetscape Design, Imperial College Press, 2012

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Lecture:</b> Basic terms in transportation planning, repetition.  <b>Practice:</b> Design methods in transportation planning.</p> <p><b>4<sup>th</sup> week:</b>  <b>Lecture:</b> The different transport modes, terms, attributes, costs.  <b>Practice:</b> Transport modes, calculation practice.</p> <p><b>6<sup>th</sup> week:</b>  <b>Lecture:</b> Environmental impacts of traffic. Air pollution, noise, groundwater hazard, animal life.  <b>Practice:</b> Reduction principles on environmental impacts. Active and passive cutback possibilities.</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Lecture:</b> History and role of urban transport services.  <b>Practice:</b> Capacity evolution of urban transport services.</p> <p><b>5<sup>th</sup> week:</b>  <b>Lecture:</b> Network principles. 101 basics in modelling of transport systems. Traffic control and influencing.  <b>Practice:</b> Handling of homework.</p> <p><b>7<sup>th</sup> week:</b>  <b>Lecture:</b> Rail transit. Railway planning. Introduction to trackbound design. Repetition of Bachelor level knowledge. General approach and issues.  <b>Practice:</b> Consultation of homework.</p>
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<p><b>9<sup>th</sup> week:</b>  <b>Lecture:</b> Rail transit. Urban rail transit. Typical planning considerations.  <b>Practice:</b> Case studies of European and Asian cities.</p> <p><b>11<sup>th</sup> week:</b>  <b>Lecture:</b> Alternative transit options. Bus rapid transit. Design principles.  <b>Practice:</b> Streetscape design issues.</p> <p><b>13<sup>th</sup> week:</b>  <b>Lecture:</b> Paratransit, disability categories, properties, costs.  <b>Practice:</b> Planning issues about of paratransit.</p>	<p><b>10<sup>th</sup> week:</b>  <b>Lecture:</b> Rail transit, regional rail transit. State-of-the-art systems on commuter traffic.  <b>Practice:</b> Consultation of homework.</p> <p><b>12<sup>th</sup> week:</b>  <b>Lecture:</b> Unconventional urban transport systems. Trackbound types and other cabin systems.  <b>Practice:</b> Consultation of homework.</p> <p><b>14<sup>th</sup> week:</b>  <b>Lecture:</b> Mid-term test.  <b>Practice:</b> Handling of homework.</p>

## Requirements

### A, for a signature:

Participation at **practices** is compulsory. Students have to attend practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. Attendance be recorded by the practice leader. Being late counts as an absence. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct does not meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

There is one test, at the end of the semester. A student can retake the test once if necessary. The test is valid if it reaches 51 points out of 100. A valid test is the requirement for the signature.

During semester, there is one homework to be submitted. An accepted homework is a requirement for the signature. The homework is valid if it reaches 51 out of 100 points. A valid homework is the requirement for the signature.

### B, for a grade:

The course ends in an **examination grade**, based on the points of the tests, the homework and the exam. At the exam, further 200 points can be achieved.

Percent/ Grade: 0-50 % = fail (1); 51-62 % = pass (2); 62-73 % = satisfactory (3); 74-85 % = good (4); 86-100 % = excellent (5)

## Public Works I

Code: MK5VIZ1S4TX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: Yes (Public Works II)

Number of teaching hours/week (lecture + practice): 2 + 2

### Topics:

This course presents basic technical parameters of water public work, water consumption and its features. Water resources in Hungary (in Europe). Water quality and water

classification. Physical, chemical and biological parameters. Water purification methods. Water supply system. Drinking water distribution system, network.

The basic designing instructions are presented for drinking water distribution system.

**Literature:**

Required:

- Jonathan T. Ricketts, M. Kent Loftin, Frederick S. Merritt, **Standard Handbook for Civil Engineers**, McGraw-Hill Publishing Company, 2003; ISBN 0-07-136473-0

Recommended:

- Melvyn Kay, **Practical Hydraulics**, Taylor and Francis Group, 2008; ISBN 978-0-415-35115-7

**Schedule**

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Lecture:</b> Technical parameters of water public work.  <b>Practice:</b> General public works plan of the street.</p> <p><b>4<sup>th</sup> week:</b>  <b>Lecture:</b> Water resources in Hungary (in Europe).  <b>Practice:</b> Consultation.</p> <p><b>6<sup>th</sup> week:</b>  <b>Lecture:</b> Water quality and water classification. Physical, chemical and biological parameters.  <b>Practice:</b> Checking the water quality on website of Water Works Ltd.</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Lecture:</b> Water consumption and its features.  <b>Practice: Semester task issuing</b></p> <p><b>5<sup>th</sup> week:</b>  <b>Lecture:</b> Type of water resources.  <b>Practice:</b> Consultation.</p> <p><b>7<sup>th</sup> week:</b>  <b>Lecture:</b> Water purification methods.  <b>Practice:</b> Pipes and fittings.</p>
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<p><b>9<sup>th</sup> week:</b>  <b>Lecture:</b> Drinking water distribution system, network.  <b>Practice:</b> Pumps and pump curves.</p>	<p><b>10<sup>th</sup> week:</b>  <b>Lecture:</b> Designing instructions for drinking water distribution system.  <b>Practice:</b> Consultation.</p>

**11<sup>th</sup> week:****Lecture:** Hardy-Cross method theory.**Practice:** Practical application of Hardy-Cross method.**13<sup>th</sup> week:****Lecture:** : Presentation of Epanet program results.**Practice:** Graphical presentation of results.**12<sup>th</sup> week:****Lecture:** EPANET program.**Practice:** Input data for Epanet 2.0 modelling program.**14<sup>th</sup> week:****Lecture:** Discussion of Epanet program.**Practice:** Semester task finishing.**15<sup>th</sup> week: 2<sup>nd</sup> drawing week****Requirements****A, for a signature:**

Participation at practice is compulsory. Students have to attend the practices and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. The attendance on practice will be recorded by the practice leader. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented.

**B, for a practical grade:**

Semester task must be done in a good technical quality.

**Public Works II**

Code: MK5VIZ2S4TX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): Public Works I

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 2

**Topics:**

This course presents basic technical parameters types of sewers. Group the sewer systems. Combined sewer system and separated sewer system. Pressure sewer system, vacuum sewer system.

Estimating wastewater flow. Sewer design. Storm water inlets. Manholes. The basic designing instructions are presented for public utilities.



**Literature:**

Required:

- Jonathan T. Ricketts, M. Kent Loftin, Frederick S. Merritt, **Standard Handbook for Civil Engineers**, McGraw-Hill Publishing Company, 2003; ISBN 0-07-136473-0
- Melvyn Kay, **Practical Hydraulics**, Taylor and Francis Group, 2008; ISBN 978-0-415-35115-7

**Schedule**

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Group the sewer systems. <b>Practice:</b> Film presentation.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Technical parameters, types of sewers. <b>Practice:</b> Semester task issuing.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Pressure sewer system. <b>Practice:</b> Estimating wastewater flow.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Vacuum sewer system. <b>Practice:</b> Discussion.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Sewer design theory. <b>Practice:</b> Dimension the gravity waste water pipe.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Modelling programs for sewer design. <b>Practice:</b> Consultation.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> SWMM program presentation. <b>Practice:</b> Storm water inlets.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Pipe systems and materials. <b>Practice:</b> Discussion of pipe systems.
<b>11<sup>th</sup> week:</b> <b>Lecture:</b> New pressure sewer system. <b>Practice:</b> Dimension the gravity storm water pipe.	<b>12<sup>th</sup> week:</b> <b>Lecture:</b> Manholes in the sewer system. <b>Practice:</b> Place of the manholes.
<b>13<sup>th</sup> week:</b> <b>Lecture:</b> Type and function of the manholes. <b>Practice:</b> Practical examples.	<b>14<sup>th</sup> week:</b> <b>Lecture:</b> Discussion of semester work and conclusions. <b>Practice:</b> Semester task finishing and submit.
<b>15<sup>th</sup> week: 2<sup>nd</sup> drawing week</b>	

## Requirements

### A, for a signature:

Attendance at **lectures** is recommended, but not compulsory.

Participation at **practice** is compulsory. Students have to attend the practice classes and may not miss more than three times during the semester. Students cannot make up a practice class with another group. Attendance at practice will be recorded by the practice leader. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments for the course to each practice. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct does not meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

Students have to **submit semester drawing task** as scheduled minimum at a sufficient level.

### B, for a grade:

The course ends in a colloquium. Based on the average of the mark of the drawing and the colloquium result, the grade is calculated as an average of them.

## Urban Artifacts

Code: MK5STAR1S3TX17-EN

ECTS Credit Points: 3

Evaluation: mid-semester grade

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### Topics:

History of bridges. Bridges classes. Norms and preliminary works. Foundations, substructures and equipment. Dilatations. Structure and building techniques of steel bridges. Steel beam bridges. Steel frame, arch and suspension bridges. Orthotropic plates. Structure and building techniques of concrete bridges. Concrete beam, frame and arch bridges. Prestressing techniques. Precast pretensioned girder bridges. Concrete box girders. Structures and building techniques of cable-stayed bridges. Composite and timber bridges. Test loading, monitoring and maintenance and strengthening techniques. Reservoirs, bunkers water-towers.

## Literature:

### Required:

- M. J. Ryall, G. A. R. Parke, J. E. Harding (2000): The Manual of Bridge Engineering, Thomas Telford
- H. G. Tyrrell (2008): History of Bridge Engineering; Stubbe Press

### Recommended:

- fib Bulletin N° 39. Seismic bridge design and retrofit - structural solutions. State-of-art report (300 pages, ISBN 978-2-88394-079-6, May 2007).
- fib Bulletin N° 32. Guidelines for the design of footbridges. Guide to good practice (160 pages, ISBN 978-2-88394-072-7, November 2005).
- fib Bulletin N° 30. Acceptance of stay cable systems using prestressing steels. Recommendation (80 pages, ISBN 978-2-88394-070-3, January 2005)
- fib Bulletin N° 29. Precast concrete bridges. State-of-art report (84 pages, ISBN 978-2-88394-069-7, November 2004).
- fib Bulletin N° 9. Guidance for good bridge design. Part 1 – Introduction. Part 2 – Design and construction aspects. Guide to good practice (190 pages, ISBN 978-2-88394-049-9, July 2000).

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> History of bridges. Bridges classes.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Norms and preliminary works.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Foundations, substructures and equipment. Dilatations.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Structure and building techniques of steel bridges. Steel beam bridges.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Steel frame, arch and suspension bridges. Orthotropic plates.	<b>7<sup>th</sup> week:</b> Study trip.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Structure and building techniques of concrete bridges. Concrete beam, frame and arch bridges.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Prestressing techniques. Precast pretensioned girder bridges. Concrete box girders.
<b>11<sup>th</sup> week:</b>	<b>12<sup>th</sup> week:</b>

**Lecture:** Structures and building techniques of cable-stayed bridges. Composite and timber bridges.

**13<sup>th</sup> week:**

**Lecture:** Reservoirs, bunkers water-towers.

**Lecture:** Test loading, monitoring and maintenance and strengthening techniques.

**14<sup>th</sup> week:**

Study trip.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week / Test / Presentations**

## Requirements

Participation at **lectures** is **compulsory**. A student has to attend lectures and may not miss more than three lectures during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the staff of the department. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented. Students are required to bring a calculator and the printed materials of the lectures with them to each lecture. Active participation is evaluated by the teacher in every class. Active student's participation should be required. Students have to **submit the test and the presentation** as scheduled minimum on a sufficient level.

### A, for a signature:

A student has to reach at least 40 points out of the 60 points on the test and at least 21 points out of the 40 points on presentation. The presentation has to be handed in personally. One will get questions about the presentation on it.

### B, for mid-semester grade:

The course ends with mid-semester grade. Based on the summa points of the test and the presentation, the mid-semester grade is defined in the following way:

<b>Test:</b>	Maximum:	<b>60 points</b>	Minimum:	<b>40 points</b>
<b>Homework:</b>	Maximum:	<b>40 points</b>	Minimum:	<b>21 points</b>
<b>Summa points:</b>	Maximum:	<b>100 points</b>	Minimum:	<b>61 points</b>

Score / grade: 0 – 60 points: fail (no signature); 61 – 70 points: pass (2); 71 – 80 points: satisfactory (3); 81 – 90 points: good (4); 91 – 100 points: excellent (5)

## Urban Environmental Protection

Code: MK5TKOVK3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### **Topics:**

This series of lectures is based on the topics of urban environmental issues. Characterization of environmental elements. The impact of urbanization on the urban environment and urban metabolism. Green chemistry, chemicals in the environment: their fate and transport. Transport processes in the environment. Air pollution sources in urban environment. Basic atmospheric phenomena. Air pollution modelling. Urban air quality, monitoring and biomonitoring network. Impacts of air pollution. Policies and legislation. Water resource systems. Aquatic chemistry. Water quality control. Water and wastewater treatment technology. The importance of soil, soil origin and development. Soil conservation, erosion, deflation. Characteristics of urban soils. Definitions of waste, waste arising. Methods of characterizing municipal solid waste. The variability of municipal solid waste generation. History of waste treatment and disposal. Waste recycling, economic considerations. Introduction to waste management. Fundamentals of noise and vibration, noise propagation, noise pollution and noise measurements.

### **Literature:**

Required:

- Andrew Farmer: Handbook of Environmental Protection and Enforcement: Principles and Practice (Hardcover), 294 pages, 2007, ISBN-13: 978-1844073092
- Mukesh Doble: Green Chemistry and Engineering (Hardcover), 381 pages, 2007, ISBN-13: 978-0123725325
- Jerry A. Nathanson, Richard A. Schneider: Basic Environmental Technology: Water Supply, Waste Management and Pollution Control. Prentice Hall (6th Edition, 2015), 456 pages, ISBN-13: 9780132840149

Recommended:

- Trevor Letcher, Daniel Vallero: Waste: A Handbook for Management. Academic Press (1st edition, 2011), 604 pages, ISBN 9780123814753

### **Schedule**

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** The basic concepts of environmental protection and management. Characterization of environmental elements.

#### 4<sup>th</sup> week:

**Lecture:** Transport processes in the environment.

#### 6<sup>th</sup> week:

**Lecture:** Air pollution modelling. Urban air quality, monitoring and biomonitoring network. Impacts of air pollution.

### 8<sup>th</sup> week: 1<sup>st</sup> drawing week

#### 9<sup>th</sup> week:

**Lecture:** Water quality control. Water and wastewater treatment technology.

#### 11<sup>th</sup> week:

**Lecture:** The importance of soil, soil origin and development. Soil conservation, erosion, deflation. Characteristics of urban soils.

#### 13<sup>th</sup> week:

**Lecture:** Fundamentals of noise and vibration, noise propagation, noise pollution and noise measurements.

### 15<sup>th</sup> week: 2<sup>nd</sup> drawing week

#### 3<sup>rd</sup> week:

**Lecture:** The impact of urbanization on the urban environment and urban metabolism. Green chemistry, chemicals in the environment: their fate and transport. Environmental analysis.

#### 5<sup>th</sup> week:

**Lecture:** Air pollution sources in urban environment. Basic atmospheric phenomena.

#### 7<sup>th</sup> week:

**Lecture:** Water resource systems. Aquatic chemistry.

#### 10<sup>th</sup> week:

**Lecture:** Protection of Nature and Landscape.

#### 12<sup>th</sup> week:

**Lecture:** Definitions of waste, characteristics of municipal solid waste streams. The variability of municipal solid waste generation. Basics of waste treatment and disposal. Introduction to waste management.

#### 14<sup>th</sup> week:

**Lecture:** Visit to the Local waste water treatment plant.

## Requirements

### A, for a signature:

Attendance at lectures is recommended, but not compulsory. Active participation is requested and evaluated by the teacher in every class. There are no tests during the semester.

**B, for a grade:**

The course ends in a written exam covering the whole semester material and the students get a grade on the base of its result. The minimum requirement for the end-term test is 60%.

The grade for the tests is given according to the following (score/grade):

0 – 59: fail (1); 60 – 69 points: pass (2); 70 – 79 points: satisfactory (3); 80 – 89 points: good (4); 90 – 100 points: excellent (5)

If the score of the end-term test is below 60, the student will be allowed to write it again and improve their grades.

**Greenfield Management**

Code: MK5KOR1S3TX17-EN

ECTS Credit Points: 3

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

**Topics:**

The main goal of the course is to introduce the greenfield types and their management as these areas and objects can help to manage the environmental challenges – including climate change induced pressures (e.g. flash floods) and pollution - of urban areas in a sustainable and cost effective way.

Therefore the students get basic knowledge on greenfield systems, their multifunctional values and benefits as well as on anthropogenic impacts on urban green surfaces. By introducing techniques and strategies for improving urban ecological sustainability, along with good practices and weak solutions, students will be able to understand the importance of integrated greenfield, urban and landscape management.

The greenfield management and ecological planning courses side by side provide an integrated approach and knowledge on sustainable urban management.

**Literature:**

Required:

- John W. Dover, Green infrastructure, *Incorporating plants and enhancing biodiversity in buildings and urban environments*, Routledge Taylor and Francis Group, London and New York, 2015, ISBN 978-0-415-52123-9
- Kimberly Etingoff, Urban Ecology, *Strategies for Green Infrastructure and Land Use*, Apple Academic Press Taylor and Francis Group, Oakville, Canada, 2016, ISBN: 13: 978-1-77188-281-1

Recommended:

- Green space strategies, *a good practice guide*, Comission for the Architecture and Built Environment, UK, London, 2004 pp. 44
- GreenKeys Manual, A Strategy for urban green space (2008), URL: [https://www.ioer.de/greenkeys/Greenkeys\\_Tools/manual.htm](https://www.ioer.de/greenkeys/Greenkeys_Tools/manual.htm)
- Harnik, P., Urban Green, *Innovative Parks for Resurgent Cities*, Island Press, Washington DC, 2010, pp. 208
- Palazzo, D. and Steiner, F. R., Urban Ecological Design, *A Process for Regenerative Spaces*, Island Press, Washington DC, 2011, pp. 328

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Introduction to greenfield types and functions.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Green roofs and green walls.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Urban ecosystems and the city as ecosystem.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Ecosystem services of various greenfield systems.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Impacts of green areas on urban climate and air quality.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Impacts of green areas on the urban hydrological cycle. Green solutions.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	Visiting the “passive house” of the university.
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Impacts of green areas on human health and well-being.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Anthropogenic pressures and impacts on green fields
<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Sustainable management and development strategies for greenfield.	<b>12<sup>th</sup> week:</b> <b>Lecture:</b> Green Infrastructure Strategy – a new approach.
<b>13<sup>th</sup> week:</b>	<b>14<sup>th</sup> week:</b>



**Lecture:** Best practices and weak solutions around the world.

**Lecture:** Visiting Debrecen's different greenfield types.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week: TEST**

## Requirements

### A, for a signature:

Participation at practice is compulsory. Students have to attend practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. Attendance at practice will be recorded by the practice leader. Students write a test at the end of the semester, and present the result of their group work carried out during the course.

Test: Maximum: 100 points (Minimum: 60 points)

### B, for a grade:

The grade of the test and the presentation defining the mid-semester grade.

The grade is given according to the following (score/grade): 0 – 59: fail (1); 60 – 69 points: pass (2); 70 – 79 points: satisfactory (3); 80 – 89 points: good (4); 90 – 100 points: excellent (5)

## Strategic Environmental Assessment

Code: MK5KOR2S5TX17-EN

ECTS Credit Points: 5

Evaluation: mid-semester grade

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 2

### Topics:

Students will learn the method of SEA through Objectives and field of application; Provisions on screening and exemptions; sustainability aspects; criteria for determining the likely significance of effects; the relevant Directive; level of detail; SEA and other forms of assessment; Requirements for consultation; five Stages of SEA; the SEA and the report;

assessing alternatives; Content of the Environmental Report; Monitoring acquirements. Based on this study they will be able to manage the process of an assessment or to evaluate a report.

**Literature:**

Required:

- DIRECTIVE 2001/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2001 on the assessment of the effects of certain plans and programs on the environment
- A Practical Guide to the Strategic Environmental Assessment Directive; ISBN 1851127887
- Strategic Environmental Assessment in Policy and Sector Reform 211., ISBN: 978-0-8213-8559-3
- INTEGRATING THE ENVIRONMENT INTO STRATEGIC DECISION-MAKING: CONCEPTUALIZING POLICY SEA William R. Sheate, Suzan Dagg, Jeremy Richardson, Ralf Aschemann, Juan Palerm and Ulla Steen European Environment Eur. Env. 13, 1–18 (2003) Published online in Wiley InterScience DOI: 10.1002/eet.305

Recommended:

- Monica Fundingsland Tetlow & Marie Hanusch (2012) Strategic environmental assessment: the state of the art, Impact Assessment and Project Appraisal, 30:1, 15-24, DOI: 10.1080/14615517.2012.666400
- White L, Noble BF, Strategic environmental assessment for sustainability: A review of a decade of academic research, Environ Impact Asses Rev (2012)

**Schedule**

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Lecture:</b> Background and Context of the SEA: Objectives and requirements; field of application; Provisions on screening and exemptions; The level of detail in SEA; SEA and other forms of assessment.  <b>Practice:</b> introducing the task, which is a study.</p> <p><b>4<sup>th</sup> week:</b>  <b>Lecture:</b> Stages of SEA: 1<sup>st</sup> stage - Setting the context and objectives, establishing the baseline and 2<sup>nd</sup> deciding on the scope.  <b>Practice:</b> examples; consultation of the task.</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Lecture:</b> SEA and Sustainable Development.  <b>Practice:</b> Examples; consultation of the task.</p> <p><b>5<sup>th</sup> week:</b>  <b>Lecture:</b> Stages of SEA: 2<sup>nd</sup> stage - Developing and refining alternatives and assessing effects  <b>Practice:</b> Examples; consultation of the task.</p>

**6<sup>th</sup> week:**

**Lecture:** Stages of SEA: 3<sup>rd</sup> stage - Preparing the Environmental Report.

**Practice:** Content of the report; examples; consultation of the task.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week****9<sup>th</sup> week:**

**Lecture:** Case studies.

**Practice:** Students' presentations based on their studies.

**11<sup>th</sup> week:**

**Lecture:** Case studies.

**Practice:** Students' presentations based on their study.

**13<sup>th</sup> week:**

**Lecture:** Test.

**Practice:** Students' presentations based on their study.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week****7<sup>th</sup> week:**

**Lecture:** Stages of SEA: 4<sup>th</sup> stage - Consultation and decision-making; 5<sup>th</sup> stage - Monitoring implementation of the plan or program.

**Practice:** Examples; consultation of the task.

**10<sup>th</sup> week:**

**Lecture:** Case studies.

**Practice:** Students' presentations based on their studies.

**12<sup>th</sup> week:**

**Lecture:** Case studies.

**Practice:** Students' presentations based on their study.

**14<sup>th</sup> week:**

**Lecture:** Improvement chance of the test.

**Practice:** Students' presentations based on their study.

**Requirements**

**A, for a signature:** Completing and presenting their study; writing the test with a minimum result of 30%.

**B, for a grade:** Signature and writing the test with a minimum result of 61%.

**Urban Waste Management**

Code: MK5HUGKK3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

## Topics:

This subject aims to cover different areas of waste management. Legislation and regulation of wastes. European Union waste management policy, waste strategy in the EU. Municipal solid waste (MSW), hazardous waste, sewage sludge, and other wastes. Life cycling analysis of materials recycling. Waste containers, collection systems, transport. The logistics of solid waste collection. Types of collection systems, equipment, and personnel requirements. The economics of waste management. Options of waste treatment and disposal. Waste landfill, types of waste landfilled. Waste incineration, incineration technologies. Other waste treatment technologies: pyrolysis, gasification, composting, anaerobic digestion. Composting of municipal solid wastes. Environmental, public, and industrial health considerations. Hazardous waste definition, classification and generation. Green engineering and sustainable design aspects. Integrated waste management strategies.

## Literature:

Required:

- Jerry A. Nathanson, Richard A. Schneider: Basic Environmental Technology: Water Supply, Waste Management and Pollution Control. Prentice Hall (6th Edition, 2015), 456 pages, ISBN-13: 9780132840149
- George Tchobanoglous and Frank Kreith: Handbook of Solid Waste Management. McGraw-Hill Education (2nd edition, 2002), 950 pages, 2002, ISBN-13: 9780071356237

Recommended:

- Paul T. Williams, Waste Treatment and Disposal. John Wiley & sons, Ltd. (2nd edition, 2005), 392 pages, ISBN-13: 9780470849132
- Trevor Letcher, Daniel Vallero: Waste: A Handbook for Management. Academic Press (1st edition, 2011), 604 pages, ISBN 9780123814753
- Alireza Bahadori: Waste Management in the Chemical and Petroleum Industries, Wiley, 2013. ISBN: 978-1-118-73175-8

## Schedule

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** The current situation and challenges of waste management in the world. Environmental, public, and industrial health considerations.

#### 4<sup>th</sup> week:

#### 3<sup>rd</sup> week:

**Lecture:** Legislation and regulation of wastes. European Union waste management policy, waste strategies.

#### 5<sup>th</sup> week:

**Lecture:** The logistics of solid waste collection. Waste containers, types of

**Lecture:** Options of waste treatment and disposal. The economics of waste management. Waste management plans.

**6<sup>th</sup> week:**

**Lecture:** Waste landfill, types of waste landfilled. Landfills for hazardous waste, for non-hazardous waste, and for inert waste.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week**

**9<sup>th</sup> week:**

**Lecture:** Life cycling analysis of materials recycling. Recyclable materials, municipal recycling facilities. Turning waste into a resource and build up a circular economy.

**11<sup>th</sup> week:**

**Lecture:** Other waste treatment technologies: pyrolysis, gasification. Shipment of waste around the world.

**13<sup>th</sup> week:**

**Lecture:** Processing and utilization of plastic and rubber wastes, degradable plastics and their significance in waste management.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

collection systems, equipment, and personal requirements.

**7<sup>th</sup> week:**

**Lecture:** Waste incineration, incineration technologies. Negative effects on the environment caused by the incineration of waste. Operational conditions, technical requirements, and emission limit values for incineration and co-incineration plants.

**10<sup>th</sup> week:**

**Lecture:** Composting, anaerob digestion. Composting of municipal solid wastes. Treatment methods for biodegradable waste.

**12<sup>th</sup> week:**

**Lecture:** Green engineering and sustainable design aspects. Integrated waste management strategies.

**14<sup>th</sup> week:**

**Lecture:** Waste from the chemical industry, their handling and utilization.

## Requirements

### A, for a signature:

Attendance at lectures is recommended, but not compulsory. Active participation is requested and evaluated by the teacher in every class. There are no tests during the semester.

### B, for a grade:

The course ends in a written exam covering the whole semester material and the students get a grade on the bases of its result. The minimum requirement for the end-term test is 60%.

The grade for the tests is given according to the following (score/grade):

0 – 59: fail (1); 60 – 69 points: pass (2); 70 – 79 points: satisfactory (3); 80 – 89 points: good (4); 90 – 100 points: excellent (5)

If the score of the end-term test is below 60, the student will be allowed to write it again and improve their grades.

## Ecological Planning

Code: MK5KOR3S5TX17-EN

ECTS Credit Points: 5

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s):

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 2

### Topics:

This course has two main objectives. The first is to describe the basic science of ecology as well as environmental pressures and impacts. The second is to introduce and explain key ecological concepts/tools, as well as new approaches and good methods in design and planning in the field of sustainable urban development and landscape management.

### Literature:

Required:

- Jari Niemäla, Urban Ecology, Patterns, Processes and Applications, Oxford University Press, 2014, ISBN 978-0-19-964395-0

Recommended:

- Perlman, D. L., Milder, Practical Ecology for Planners, Developers, and Citizens. Island Press. 2004, ISBN-10 1559637161
- Forster Ndubisi, Ecological Planning, Johns Hopkins University Press, 2002, ISBN 13: 9780801868016

### Schedule

#### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** Introduction of the ecological approach in planning processes. New ideas and tools.

#### 3<sup>rd</sup> week:

**Lecture:** Environmental pressures and impacts.

**Practice:** Explaining the goals and elements of group work. Forming groups among students, case study selection.

**4<sup>th</sup> week:**

**Lecture:** Systems thinking and design thinking – the new way of planning and design.

**Practice:** Group work: Elaborating a conceptual model, a DPSIR model and a Leopold Matrix for the case study.

**6<sup>th</sup> week:**

**Lecture:** Sustainable building and urban development and planning – ecological approach applied in engineering.

**Practice:** Group work: Listing the ecological planning tools to be applied.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week**

**9<sup>th</sup> week:**

**Lecture:** Sponge cities, green cities.

**Practice:** Group work: Analysing the ecological planning tools to be applied.

**11<sup>th</sup> week:**

**Lecture:** Management of point and diffuse pollution sources.

**Practice:** Weak solutions and good practices.

**13<sup>th</sup> week:**

**Lecture:** Integrated river basin management. The ecohydrological approach (cont.).

**Practice:** Finalizing group work.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week: Test**

**Practice:** Group work: Analysing the environmental pressures and impacts in the case study.

**5<sup>th</sup> week:**

**Lecture:** Settlement as ecosystem. The role and importance of ecosystems in urban areas. Interactions between natural and manmade environments.

**Practice: Group work:** Group work: Analysing the interactions and the ecosystem services in the case study.

**7<sup>th</sup> week:**

**Lecture:** Smart cities. (water, waste and energy issues),

**Practice:** Group work: Analysing the ecological planning tools to be applied.

**Field trip**

**10<sup>th</sup> week:**

**Lecture:** Renewable energy sources.

**Practice:** Weak solutions and good practices.

**12<sup>th</sup> week:**

**Lecture:** Introduction into Ecohydrology. Ecological aspects in the water management and rural planning. Engineering measures in wetlands (goals, types and impacts).

**Practice:** Weak solutions and good practices.

**14<sup>th</sup> week:**

**Lecture:** Integrated rural and urban development for the sustainability.

**Practice:** Presentation of group work.

**Requirements**

**A, for a signature:**

Participation at practice is compulsory. Students have to attend practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. Attendance at practice will be recorded by the practice leader. Students write a test at the end of the semester, and present the result of their group work carried out during the course.

Test:	Maximum:	50 points
Presentation:	Maximum:	50 points
Summa:	100 points	(Minimum: 60 points)

### **B, for a grade:**

The grade of the test and the presentation defining the mid-semester grade.

The grade is given according to the following:

0 – 59: fail (1); 60 – 69 points: pass (2); 70 – 79 points: satisfactory (3); 80 – 89 points: good (4); 90 – 100 points: excellent (5)

## **Urban Renewal Processes**

Code: MK5MAG1S03TX17-EN

ECTS Credit Points: 3

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup>, year 1<sup>st</sup> semester

Prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### **Topics:**

Phenomena, tools and procedures of urban rehabilitation processes via actual, already finalized or ongoing programmes in the EU and worldwide. Segregation. Improvement of housing conditions as an essential criterion of these actions. Good and bad practices: explanation along with the structural, economic, legal background of the projects. Urban heritage. Discussion and profound analysis of the urban renewal programmes. The future path of more efficient rehabilitation.

Studio: urban rehabilitation is an integrated part of the Urban Design Studio (design task).

Lectures: interactive + frontal lecture + various tasks at the lectures

### **Literature:**

*Recommended:*



5. Fitz, A. -Krasny, E. -Architekturzentrum Wien, 2019. Critical Care: Architecture and Urbanism for a Broken Planet. The MIT Press, Cambridge/London. ISBN 978-0-262-53683
6. Council of Europe, 2005. Guidance on urban rehabilitation. Council of Europe Publishing, Strasbourg. ISBN 978-92-871-5528-3
7. UNESCO, 2016. Culture: urban future; global report on culture for sustainable urban development. UNESCO, Paris. ISBN:978-92-3-100170-3
8. Case Studies: Social Rehabilitation, Industrial Heritage, Evaluation of Urban Renewal Processes. Collected articles and handbooks are going to be available on the e-learning platform.

## Schedule

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** Urban renewal processes. Introduction – phenomena.

#### 4<sup>th</sup> week:

**Lecture:** Field trip (joint: Urban Design, Urban Morphology)

#### 6<sup>th</sup> week:

**Lecture:** Segregation. Social Urban Rehabilitation. Case Studies.

### 8<sup>th</sup> week: 1<sup>st</sup> drawing week

#### 9<sup>th</sup> week:

**Lecture:** Urban Rehabilitation Towards Urban Sustainability and Resilience.

#### 11<sup>th</sup> week:

**Lecture:** Acts and policies: individual case studies.

#### 13<sup>th</sup> week:

**Lecture:** How to include urban renewal in the urban design process.

### 15<sup>th</sup> week: 2<sup>nd</sup> drawing week

#### 3<sup>rd</sup> week:

**Lecture:** Urban Rehabilitation. Case Studies.

#### 5<sup>th</sup> week:

**Lecture:** Urban Revitalisation. Case Studies.

#### 7<sup>th</sup> week:

**Lecture:** Functional Urban Rehabilitation. Case Studies.

#### 10<sup>th</sup> week:

**Lecture:** Changing neighbourhoods. Social Inclusion.

#### 12<sup>th</sup> week:

**Lecture:** Urban Heritage. UNESCO and local authorities. Case Studies.

#### 14<sup>th</sup> week:

**Lecture:** Systematization and discussion. Valorisation and evaluation.

## Requirements

A, for a signature:

Participation in lectures is compulsory. Students must attend lectures and may not miss more than three lectures during the semester (11+3). In case of further absences, a medical certification or another official certificate from other authorities must be presented. The attendance is recorded by the lecturer. Being late is equivalent to an absence. In case of unofficially justified absence over the 3 allowed, the subject will not be signed (completed) and the student must repeat the course.

**B, for grade:**

The final evaluation takes into consideration the performance at the lectures and the Urban Rehabilitation section of the Urban Design Studio.

## Urban Planning I

Code: MK5MAG2S5TX17-EN

ECTS Credit Points: 5

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: Yes (Urban Planning II)

Number of teaching hours/week (lecture + practice): 2 + 2

**Topics:**

The first part of the course entitled “Urban Planning” focuses on the process of urban development. Main topics are as follows: goals, technics, participants, and resources of urban development. Students will be able to produce urban development plans like feasibility study, urban development concept, and integrated urban development strategy.

**Literature:**

Required:

- Weber, R. & Crane, R. (Eds.), 2012: The Oxford Handbook of Urban Planning. Oxford University Press, Oxford. ISBN 978-0-19-023526-0
- Bayer, M., Frank, N. & Valerious, J., 2010: Becoming an Urban Planner. John Wiley and Sons, Hoboken, NJ. ISBN 978-0-470-27863-5

Recommended:

- Gehl, J., 2010: Cities for People. Island Press, 978-1597265737

## Schedule

1<sup>st</sup> week Registration week

**2<sup>nd</sup> week:**

**Lecture:** Challenges that cities are facing worldwide. Urban development as response for the challenges.

**Practice:** Investigating challenges that cities are facing worldwide.

**4<sup>th</sup> week:**

**Lecture:** The basis of the urban development process: The Feasibility study

**Practice:** Creating a Feasibility study.

**6<sup>th</sup> week:**

**Lecture:** Long-term goals of the urban development process: The Urban development concept.

**Practice:** Creating an Urban development concept.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week****9<sup>th</sup> week:**

**Lecture:** Planning operative development projects: The Integrated urban development strategy.

**Practice:** Creating an Integrated urban development strategy.

**11<sup>th</sup> week:**

**Lecture:** Case studies: urban development in Europe.

**Practice:** Analysing selected case studies.

**13<sup>th</sup> week:**

**Lecture:** Case studies: urban development in Latin America.

**Practice:** Analysing selected case studies.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week****3<sup>rd</sup> week:**

**Lecture:** Goals, methods, participants, and resources of urban development. Sustainable urban development.

**Practice:** Planning the urban development process.

**5<sup>th</sup> week:**

**Lecture:** The basis of the urban development process: The Feasibility study

**Practice:** Creating a Feasibility study.

**7<sup>th</sup> week:**

**Lecture:** Long-term goals of the urban development process: The Urban development concept.

**Practice:** Creating an Urban development concept.

**10<sup>th</sup> week:**

**Lecture:** Planning operative development projects: The Integrated urban development strategy.

**Practice:** Creating an Integrated urban development strategy.

**12<sup>th</sup> week:**

**Lecture:** Case studies: urban development in Northern America.

**Practice:** Analysing selected case studies.

**14<sup>th</sup> week:**

**Lecture:** Case studies: urban development in Asia.

**Practice:** Analysing selected case studies.

**Requirements****A, for a signature:**

Attendance at lectures is recommended, but not compulsory.

Participation at practice is compulsory. Students have to attend the practical classes and may not miss more than three practical classes during the semester. In case a student

misses more than three, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. The attendance at practice will be recorded by the practice leader. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments for the course with them to each practice. Active participation is evaluated by the teacher in every class.

Students (or the group of students) have to submit all the three urban development strategies as scheduled minimum at a sufficient level.

**B, for a grade:**

An oral exam has to be taken in order to get a grade.

## Urban Planning II

Code: MK5MAG3S5TX17-EN

ECTS Credit Points: 5

Evaluation: exam

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): Urban Planning I

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 2

**Topics:**

The second part of the course entitled “Urban Planning” focuses on the process of urban planning. Main topics are as follows: the necessity of planning, the history of planning, plan making and the types of plans, planning agents, and institutions in planning, land-use planning, and the practice of zoning.

**Literature:**

Required:

- Weber, R. & Crane, R. (Eds.), 2012: The Oxford Handbook of Urban Planning. Oxford University Press, Oxford. ISBN 978-0-19-023526-0
- Bayer, M., Frank, N. & Valerious, J., 2010: Becoming an Urban Planner. John Wiley and Sons, Hoboken, NJ. ISBN 978-0-470-27863-5

Recommended:

- Gehl, J., 2010: Cities for People. Island Press, 978-1597265737

## Schedule

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** The history of urban planning, and the necessity of planning. Part I

**Practice:** Types of plans. Part I

#### 4<sup>th</sup> week:

**Lecture:** Principle goals of planning. Part I

**Practice:** Land-use planning. Part I

#### 6<sup>th</sup> week:

**Lecture:** Plan making. Modelling urban systems. Part I

**Practice:** Planning and zoning. Part I

### 8<sup>th</sup> week: 1<sup>st</sup> drawing week

#### 9<sup>th</sup> week:

**Lecture:** Planning agents, and institutions in planning. Part I

**Practice:** How to create structure plans. Part I

#### 11<sup>th</sup> week:

**Lecture:** Case studies: urban planning in Europe.

**Practice:** Analysing selected case studies.

#### 13<sup>th</sup> week:

**Lecture:** Case studies: urban planning in Latin America.

**Practice:** Analysing selected case studies.

### 15<sup>th</sup> week: 2<sup>nd</sup> drawing week

#### 3<sup>rd</sup> week:

**Lecture:** The history of urban planning, and the necessity of planning. Part II

**Practice:** Types of plans. Part I

#### 5<sup>th</sup> week:

**Lecture:** Principle goals of planning. Part II

**Practice:** Land-use planning. Part II

#### 7<sup>th</sup> week:

**Lecture:** Plan making. Modelling urban systems. Part I

**Practice:** Planning and zoning. Part II

#### 10<sup>th</sup> week:

**Lecture:** Planning agents, and institutions in planning. Part II

**Practice:** How to create structure plans. Part II

#### 12<sup>th</sup> week:

**Lecture:** Case studies: urban planning in Northern America.

**Practice:** Analysing selected case studies.

#### 14<sup>th</sup> week:

**Lecture:** Case studies: urban planning in Asia.

**Practice:** Analysing selected case studies.

## Requirements

### A, for a signature:

Attendance at lectures is recommended, but not compulsory.

Participation at practice is compulsory. Students have to attend the practical classes and may not miss more than three practical classes during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. The attendance at practice will be recorded by the practice leader. Being late counts as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes

should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments for the course with them to each practice. Active participation is evaluated by the teacher in every class.

Students (or the group of students) have to submit a land-use plan, a zoning plan, and a structure plan as scheduled minimum at a sufficient level.

**B, for a grade:**

An oral exam has to be taken in order to get a grade.

## **Urban Design**

Code: MK5MAG4S4TX17-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 0 + 3

**Topics:**

The subject "Urban Design" focuses on the formation and types of the cities, and the past and the present of the urbanism as a discipline, with special emphasis on the second half of the 20th century. During the semester the actual questions of the urbanisation will also be discussed; namely the problems of the post-industrial age, the rehabilitation; and the newest trends of urbanism. During the practical lectures the students has to solve two design problems: the healing of a damaged urban tissue, and the rehabilitation of an industrial site.

**Literature:**

Required:

- Weber, R. & Crane, R. (Eds.), 2012: The Oxford Handbook of Urban Planning. Oxford University Press, Oxford. ISBN 978-0-19-023526-0
- Matthew Carmona et. al, 2003: Public Places, Urban Spaces: The Dimensions of Urban Design. Routledge. ISBN 1856178277
- Vítor Oliviera, 2016: Urban Morphology. An Introduction to the Study of the Physical Form of Cities. Springer. ISBN 978-3-319-32081-6

Recommended:

- Bayer, M., Frank, N. & Valerious, J., 2010: Becoming an Urban Planner. John Wiley and Sons, Hoboken, NJ. ISBN 978-0-470-27863-5

## Schedule

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** Historical outline 1. Formation and characteristic of the historic cities in the Ancient Europe and outside Europe.

**Practice:** General discussion about the first student project (urban tissue healing), selection of the location.

#### 4<sup>th</sup> week:

**Lecture:** Morphology 1. The elements of Urban Form.

**Practice:** Design work (urban tissue healing).

#### 6<sup>th</sup> week:

**Lecture:** Urbanism in the 19th century and in the first half of the 20th century in Europe.

**Practice:** Design work (urban tissue healing).

### 8<sup>th</sup> week: 1<sup>st</sup> drawing week

#### 9<sup>th</sup> week:

**Lecture:** Urban rehabilitation. Historic centres, rust zones.

**Practice:** Design work (industrial rehabilitation).

#### 11<sup>th</sup> week:

**Lecture:** Contemporary trends of urbanism 1. New Urbanism, Smart City.

**Practice:** Design work (industrial rehabilitation).

#### 13<sup>th</sup> week:

**Lecture:** Case studies. Miskolc and Kosice: two medium sized cities in Central Europe;

#### 3<sup>rd</sup> week:

**Lecture:** Historical outline 2. Formation and characteristic of the historic cities in the Middle Ages and in the Early Modern age in Europe.

**Practice:** On-site investigation, exploring the problems.

#### 5<sup>th</sup> week:

**Lecture:** Morphology 2. The agents and processes of urban transformation.

**Practice:** Design work (urban tissue healing).

#### 7<sup>th</sup> week:

**Lecture:** Urbanism in the second half of the 20th century in Europe and worldwide.

**Practice:** General discussion about the second student project (industrial rehabilitation), selection of the location.

#### 10<sup>th</sup> week:

**Lecture:** Contemporary trends of urbanism 1. New Urbanism, Smart City

**Practice:** Design work (industrial rehabilitation).

#### 12<sup>th</sup> week:

**Lecture:** Case study. Vienna and Budapest: two large cities in Central Europe, parallels and differences.

**Practice:** Design work (industrial rehabilitation).

#### 14<sup>th</sup> week:

**Lecture:** Case studies outside Europe.

parallels and differences. Berlin: the capital of the united Germany, twice.

**Practice:** Design work (industrial rehabilitation).

**Practice:** Design work (industrial rehabilitation).

15<sup>th</sup> week: 2<sup>nd</sup> drawing week

## Requirements

### A, for a signature:

Participation at practice is compulsory. Students have to attend the practical classes and may not miss more than three practical classes during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Students cannot make up a practice with another group. Attendance at practice will be recorded by the practice leader. Being late counts as an absence. Missed practice classes should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments for the course with them to each practice. Active participation is evaluated by the teacher in every class.

Students (or the group of students) have to submit both design projects as scheduled minimum at a sufficient level.

### B, for a grade:

A successful test has to be taken in order to get a grade.

## City Operations and Smart Cities

Code: MK5TEL4S4TX17-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 3 + 0

### Topics:

Administration: Municipality, Budget, Taxes. Transportation and Infrastructure: Information Technology, Planning and Development, Public Transit and Light Rail, Street Transportation, Roads, Bicycle Transit Systems. Community Services: Housing, Human Services, Library, Neighborhood Services, Parks and Recreation, Education, Arts & Culture. Economic Development: Aviation, Community and Economic Development. Environment / Sustainability: Environmental Programs, Public Works, Water Services/Water Strategy,



Sustainability, Greenfields. Public Safety: Emergency Management, Fire, Police, Human Resources, Law.

**Literature:**

Required:

- Robert H. Clarke, 1996. Public Works: Engineering in Local Government. Thomas Telford, London.
- K. Wellman, Marcus Spiller, 2012. Urban Infrastructure: Finance and Management. John Wiley & Sons, Hoboken, New Jersey.

Recommended:

- Genevieve Giuliano, Susan Hanson, 2017. The Geography of Urban Transportation, Fourth Edition. Guilford Publications, New York – London.

**Schedule**

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Lecture:</b> Administration: Municipality, Budget, Taxes.</p> <p><b>4<sup>th</sup> week:</b>  <b>Lecture:</b> Transportation and Infrastructure: Information Technology, Planning and Development, Public Transit and Light Rail, Street Transportation, Roads, Bicycle Transit Systems. Part II</p> <p><b>6<sup>th</sup> week:</b>  <b>Lecture:</b> Community Services: Housing, Human Services, Library, Neighbourhood Services, Parks and Recreation, Education, Arts &amp; Culture. Part II</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Lecture:</b> Transportation and Infrastructure: Information Technology, Planning and Development, Public Transit and Light Rail, Street Transportation, Roads, Bicycle Transit Systems. Part I</p> <p><b>5<sup>th</sup> week:</b>  <b>Lecture:</b> Community Services: Housing, Human Services, Library, Neighbourhood Services, Parks and Recreation, Education, Arts &amp; Culture. Part I</p> <p><b>7<sup>th</sup> week:</b>  <b>Lecture:</b> Economic Development: Aviation, Community and Economic Development. Part I</p>
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<p><b>9<sup>th</sup> week:</b>  <b>Lecture:</b> Economic Development: Aviation, Community and Economic Development. Part II</p>	<p><b>10<sup>th</sup> week:</b>  <b>Lecture:</b> Environment / Sustainability: Environmental Programs, Public Works,</p>

**11<sup>th</sup> week:**

**Lecture:** Environment / Sustainability: Environmental Programs, Public Works, Water Services/Water Strategy, Sustainability, Greenfields. Part II

**13<sup>th</sup> week:**

**Lecture:** Case studies. Part I

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

Water Services/Water Strategy, Sustainability, Greenfields. Part I

**12<sup>th</sup> week:**

**Lecture:** Public Safety: Emergency Management, Fire, Police, Human Resources, Law.

**14<sup>th</sup> week:**

**Lecture:** Case studies. Part II

**Requirements****A, for a signature:**

Participation at lectures is compulsory. Students have to attend lectures and may not miss more than three of them during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded by the lecturer. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed lectures must be made up for at a later date, being discussed with the tutor.

**B, for a grade:**

An oral exam has to be taken in order to get a grade.

**Real Estate Development and Management**

Code: MK5TEL3S3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

**Topics:**

Development of the land market; changes in the ownership and tenure system. Land evaluation procedures. History, structure, aims and role of real estate registers. Real estate law (national and community level). Real estate management versus settlement

economics and site management. Evolution of modern immovable property. Identification of real property. Real estate financing. Residential property development: processes and actors. Real property analysis. Real estate marketing: demand, supply and adjustment. Overview of real estate markets (Hungary, EU, USA). Housing policy.

## Literature:

Required:

- Emerging Trends in Real Estate Europe 2016 (<https://www.pwc.ch/en/publications/2016/emerging-trends-in-real-estate-europe-2016.pdf>)
- Vulnerabilities in the EU residential real estate sector (November 2016) ([https://www.esrb.europa.eu/pub/pdf/reports/161128\\_vulnerabilities\\_eu\\_residential\\_real\\_estate\\_sector.en.pdf](https://www.esrb.europa.eu/pub/pdf/reports/161128_vulnerabilities_eu_residential_real_estate_sector.en.pdf))
- Real Property Law and Procedure in the European Union (Reports 2015) <http://www.eui.eu/DepartmentsAndCentres/Law/ResearchAndTeaching/ResearchThemes/ProjectRealPropertyLaw.aspx>

Recommended:

- Real Property Law and Procedure in the European Union (General Report) Final Version, 2005) (<http://www.eui.eu/Documents/DepartmentsCentres/Law/ResearchTeaching/ResearchThemes/EuropeanPrivateLaw/RealPropertyProject/GeneralReport.pdf>)

## Schedule

### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Lecture:** Introduction to the basic terms in real estate management: Properties. Property deed. Real estate management. Landuse. Forms of management.

#### 4<sup>th</sup> week:

**Lecture:** Land and real estate register: The history of land and real estate registration. Aims and significance of land and real estate registration. Principles by real estate laws. Parts of registration. Steps in land and real estate registration.

#### 6<sup>th</sup> week:

**Lecture:** Basic issues related to settlement economics and site management: Subjects and objects of settlement economics, roles

#### 3<sup>rd</sup> week:

**Lecture:** The land, as the base of real estate management: History and current situation of the methods and structure of landuse in Hungary. Changes in the property and ownership after the Second World War.

#### 5<sup>th</sup> week:

**Lecture:** Sources of law related to real estates: Conceptual definition of real estate law. Hungarian sources of real estate laws. Quasi sources of law. Community regulations related to real estates.

#### 7<sup>th</sup> week:

**Lecture:** Property management: Evolution of the modern property management. Economic and property cycle. Role of

and characters. Enforcement of public role and community interests in settlement economics. Set of instruments of settlement economics. Economic policy of local governments. "Environmental" relations of settlements. Asset management in urban environments.

**8<sup>th</sup> week: 1<sup>st</sup> drawing week**

**9<sup>th</sup> week:**

**Lecture:** Real estate development in practice: Definition of real estate development. Development of residential properties: process and actors. Role and methods of market research in real estate development. Property market analyses. Introduction to the most important related indicators and statistics.

**11<sup>th</sup> week:**

**Lecture:** Real estate marketing I: Definition of marketing (actors, concepts, marketing-mix, advertising campaign). Introduction of the most important components of marketing activities from the aspect of the real estate market. Sales vs. marketing. Market research methods in residential property developments.

**13<sup>th</sup> week:**

**Lecture:** Housing policy in Hungary and in the European Union: Overview of the Hungarian housing policy: from the socialist years (1953-1990) to the present. Fluctuations in the rent rate. Changes in the state share in the number of new flats. EU measures related to housing policy. Comparison of housing policy on the level of Member States. Changes in the real estate stock of the European Union.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

property management. Property financing. Types of properties owned by local governments. Tasks of the Real Estate Management Groups in the local governments.

**10<sup>th</sup> week:**

**Lecture:** Construction sector and settlement planning: Legislation related to construction industry. Planning and approval of settlement management. Elements of spatial planning and environmental impact assessment.

**12<sup>th</sup> week:**

**Lecture:** Real estate marketing II: Impacts of the EU accession on the real estate markets of the Member States. Opportunities and regulations in the real estate market in the EU and in the Member States.

**14<sup>th</sup> week:**

**Lecture:** Real estate financing and the system of housing support: Financial sources. Bank loans for property development. Banking experience in real estate financing. Special financing instruments: leasing. Comparison of loans and housing supports on the level of property owners. Efficiency of the banking and supporting systems. Housing preferences and other support forms. Tax advantages, expense advantages, exemption from expenses. Employer residential support (after 2014). Family Housing Allowance.

## Requirements

### A, for a signature:

Attendance at lectures is recommended, but not compulsory.

### B, for a grade:

The course ends in a colloquium.

## Municipal Administration

Code: MK5TELS3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### Topics:

The primary goal of this course is to familiarize students with the roles that municipalities fulfil in local affairs. To achieve this, the course focuses on three areas in this semester:

- the basic elements of self-governments,
- the most important international trends,
- and the characteristics of municipal tasks.

The course also aims to cover all important municipal bodies and their operation.

### Literature:

Required:

- Panara, Carlo - Varney, Michael R. (eds), Local Government in Europe. The 'Fourth Level' in the EU Multi-Layered System of Governance, Routledge, 2015, ISBN: 978-1-138-93004-9
- Schaap, Linze - Daemen, Harry (eds), Renewal in European Local Democracies. Puzzles, Dilemmas and Options, VS Verlag für Sozialwissenschaften, 2012, ISBN: 978-3-531-18763-1
- Loughlin, John - Hendriks, Frank - Lidstrom, Anders, The Oxford Handbook of Local and Regional Democracy in Europe, Oxford University Press, 2012, ISBN: 978-0-19-956297-8

Recommended:

- Bowman, Ann O'M. - Kearney, Richard C., State and Local Government, Wadsworth Publishing, 2016, ISBN: 978-1-305-38847-5
- Stenberg, Carl W. - Austin, Susan Lipman, Managing Local Government Services. A Practical Guide, International City/County Management Association, 2013, ISBN: 978-0-87-326709-0

## Schedule

1 <sup>st</sup> week Registration week	
<p><b>2<sup>nd</sup> week:</b></p> <p><b>Lecture:</b> Local administration, self-governments and municipal administration: evolution, history and models.</p> <p><b>4<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Types of local self-governments. The attributes of local self-governmental tasks. Cases and examples.</p> <p><b>6<sup>th</sup> week:</b></p> <p><b>Lecture:</b> The tasks of councillors and the principles of corporative operations. Direct methods of local governance.</p>	<p><b>3<sup>rd</sup> week:</b></p> <p><b>Lecture:</b> Basic questions of local governance in international documents. The most important regulations of the European Charter of Local Self-Government.</p> <p><b>5<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Scope of self-government's duties and authority; the role of self-governments in municipal administration.</p> <p><b>7<sup>th</sup> week:</b></p> <p><b>Lecture:</b> The mayor's scope of duties. Cases and examples.</p>
8th week: 1st drawing week / 1st test	
<p><b>9<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Cooperation in municipal administration, the partnerships of self-governments I.</p> <p><b>11<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Connections of local self-governments and central organs I.</p> <p><b>13<sup>th</sup> week:</b></p>	<p><b>10<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Cooperation in municipal administration, the partnerships of self-governments II. Special rules of capital cities, catchment areas and middle level self-governments.</p> <p><b>12<sup>th</sup> week:</b></p> <p><b>Lecture:</b> Connections of local self-governments and central organs II. A short outlook: the property and economy of municipal administration.</p> <p><b>14<sup>th</sup> week:</b></p>

**Lecture:** New tendencies of self-governments' regulation I. An international overview.

**Lecture:** New tendencies of self-governments' regulation II. What is the future of municipal administration?

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week / 2<sup>nd</sup> test**

## Requirements

### A, for a signature:

Attendance is **compulsory**. Students have to attend the lectures and may not miss more than three lectures during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Attendance at lectures will be recorded. In case of further absences, a medical certificate needs to be presented. Active student's participation should be required.

### B, for a grade:

Students have to **submit all the two tests** as scheduled minimum at a sufficient level. In order to take a **mid-semester grade** – minimum (2) pass grade, – minimum point of test has to be taken. The minimum and the maximum points related to the tests can be obtained are the follows:

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#### Tests:

1. Test:	Maximum:	<b>50 points</b>	Minimum:	<b>30 points</b>
2. Test:	Maximum:	<b>50 points</b>	Minimum:	<b>30 points</b>
<b>Summa points:</b>	Maximum:	<b>100 points</b>	Minimum:	<b>60 points</b>

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## Built Heritage Protection

Code: MK5TEL6S3TX17-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 2<sup>nd</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2 + 0

### Topics:

Definition and types of historic buildings and monuments. Evolution of the concept of historic building protection. The Athens Charter (1933), the Venice Charter (1964), the

Washington Charter (1987), the Valletta Principles (2011). Physical ageing and functional ageing. Urbanization ageing – necessity or pretence? Renewal of historic towns: case studies from Hungary (Eger, Pécs, Székesfehérvár, Budapest, Debrecen, etc.) and other European countries (Warsaw, Southampton, Edinburgh, Greifswald, Gdansk, etc.) Tourism and protection in historic towns.

**Literature:**

Required:

- Architectural heritage protection – Guidelines for planning authorities. Dublin, ISBN 0-7557-7006-4
- The Valletta Principles for Safeguarding and Management of Historic Cities, Towns and Urban Areas. ISBN 978-960-93-4331-2

Recommended:

- Ashworth, G.J. – Tunbridge, J.E.: The Tourist-Historic City. Routledge, 1990, ISBN 978-008-04-3675-3
- Jankó, F.: Urban Renewal of Historic Towns in Hungary: Results and Prospects for Future in European Context. In Csapó, T. – Balogh, A. (eds): Development of Settlement Network in the Central European Countries. Springer –Verlag, 2012, pp. 161-174. ISBN 978-3-642-20313-8
- Hardy, M. (ed): The Venice Charter Revisited: Modernism, Conservation and Tradition in the 21<sup>st</sup> Century. Cambridge Scholars Publishing, 2008. ISBN 978-184-71-8688-1

**Schedule**

<b>1<sup>st</sup> week Registration week</b>	
<p><b>2<sup>nd</sup> week:</b>  <b>Lecture:</b> Evolution and history of the concept of built heritage protection. From the Athens Charter to the Valletta Principles.</p> <p><b>4<sup>th</sup> week:</b>  <b>Lecture:</b> Natural and social factors threatening the built heritage.</p> <p><b>6<sup>th</sup> week:</b>  <b>Lecture:</b> Special problems of protection of tenements houses and public buildings. Churches, monasteries and other parochial buildings. Synagogues, as special group of built heritage.</p>	<p><b>3<sup>rd</sup> week:</b>  <b>Lecture:</b> Physical, functional and urbanization ageing; their role and importance in urban planning and built heritage protection.</p> <p><b>5<sup>th</sup> week:</b>  <b>Lecture:</b> Special problems of protection of castles, towns-walls, fortresses.</p> <p><b>7<sup>th</sup> week:</b>  <b>Lecture:</b> Protection of residences and mansions as special group of historic buildings. Traditional countryside buildings.</p>
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	



**9<sup>th</sup> week:**

**Lecture:** Ruins. Conservation, renovation, addition, reconstruction.

**11<sup>th</sup> week:**

**Lecture:** UNESCO Built Heritage Sites. World Heritage Sites in Hungary. Protected historic sites in Hungary.

**13<sup>th</sup> week:**

**Lecture:** A historic landscape as a special synthesis of living and built heritage.

**10<sup>th</sup> week:**

**Lecture:** Industrial built heritage. Special objects: statues, engineering facilities, graveyards, parks, etc.

**12<sup>th</sup> week:**

**Lecture:** Historic cities and towns. Protection and renovation – case studies from Hungary, Poland, UK and Germany.

**14<sup>th</sup> week:**

**Lecture:** A new challenge: tourism in historic sites.

**15<sup>th</sup> week: 2<sup>nd</sup> drawing week**

**Requirements**

**A, for a signature:** participation in the lectures (at least 11 of 14)

**B, for a grade:** oral exam or making an essay

## DIPLOMA

The diploma shall be issued to the students within thirty days from having successfully passed the final exam at the grandaunt's special request. Otherwise, the diploma shall be awarded to him/her at the graduation ceremony of the Faculty.

The diploma is a public document bearing the coat of arms of the Hungary, certifying that the studies have been successfully completed in the Urban Systems Engineering master program. The diploma displays the name of the HEI (higher education institution), its institutional identification number, the serial number of diploma, the name and the place and date of birth of its holder, the level of qualification or the degree awarded, the program, the specialization, and its mode of attendance, as well as the place, day, month and year of issue. The diploma shall also contain the signature of the rector (in case of incapacitation the vice-rector), and shall bear the stamp of the University of Debrecen.

At the graduate's special request, a certificate on the completion of studies may be issued. The document does not contain any references to the qualification of the graduate, it merely proves that the he/she has taken a successful final exam. The Faculty shall keep a record of the certificates issued.

In the Urban Systems Engineering training program the diploma grade is calculated as the grade average of the results of the following items:

- weighted grade point average, (A)
- average of the grades of the thesis (evaluation of the supervisor and the referee) (B),
- grade for final exam presentation (C).

The diploma grade is calculated as follows:  $(A + B + C)/3$

The diploma shall be assessed on the basis of the calculation of the grade average as follows:

Outstanding	4,81 – 5,00
Excellent	4,51 – 4,80
Good	3,51 – 4,50
Satisfactory	2,51 – 3,50
Pass	2,00 – 2,50

### Honours Degrees/Diplomas

A degree/diploma with honours shall be issued to students who receive an excellent grade in all the subjects of the final exam, excellent grade for the thesis, the grade average of all their exam and seminar grades is 4.00. or better, and who do not have a grade lower than satisfactory (3) among his/her grades.

MODEL CURRICULUM OF URBAN SYSTEMS ENGINEERING MSC

The curriculum of the program is available in excel format on the webpage of the Faculty of Engineering (<https://eng.unideb.hu/en/node/195>).

Nr.	Group	Name of Subject	Kno.	Subject Code	1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester	Pre requisites:
1	Natural Sciences	Geographic Information Systems (GIS)	2 3	MK5GEO1S05TX17-EN	0 4 m 5				-
2	Social Sciences	Urban Morphology	2 10	MK5TEL1S02TX17-EN	2 0 e 2				-
3		Urbanization	2 10	MK5TEL2S04TX17-EN	3 0 e 4				-
4	Planning Studies	Urban Transportation Planning I.	2 7	MK5KOZ1S04TX17-EN	2 2 m 4				-
5		Urban Transportation Planning II.	2 7	MK5KOZ2S04TX17-EN		2 2 e 4			Urban Transportation Planning I.
6		Public Works I.	2 4	MK5VIZ1S04TX17-EN		2 2 m 4			-
7		Public Works II.	2 4	MK5VIZ2S04TX17-EN			2 2 e 4		Public Works I.
8		Urban Artifacts	2 8	MK5TAR1S03TX17-EN			2 0 m 3		-
9		Urban Environmental Protection	5 2	MK5TKOVK03TX17-EN	2 0 e 3				-
10		Greenfield Management	2 9	MK5KOR1S03TX17-EN		2 0 m 3			-
11		Strategic Environmental Assessment	2 9	MK5KOR2S05TX17-EN			2 2 m 5		-
12		Urban Waste Management	5 6	MK5HUGKK03TX17-EN			2 0 e 3		-
13		Ecological Planning	2 9	MK5KOR3S05TX17-EN		2 2 e 5			-
14		Urban Renewal Processes	2 1	MK5MAG1S03TX17-EN	2 0 m 3				-
15		Urban Planning I.	2 1	MK5MAG2S05TX17-EN		2 2 m 5			-
16		Urban Planning II.	2 1	MK5MAG3S05TX17-EN			2 2 e 5		Urban Planning I.
17		Urban Design	2 1	MK5MAG4S04TX17-EN	0 3 m 4				-
18		City Operations & Smart Cities	2 10	MK5TEL4S04TX17-EN		3 0 e 4			-
19		Real Estate Development and Management	2 10	MK5TEL3S03TX17-EN	2 0 e 3				-
20		Municipal Administration	2 10	MK5TEL5S03TX17-EN		2 0 e 3			-
21		Built Heritage Protection	2 10	MK5TEL6S03TX17-EN			2 0 e 3		-
22	Opt. Subj.	Elective Course I.					0 2 m 3		-
23		Elective Course II.					0 2 m 3		-
24	Inters.	Internship	2 10	MK5TEL7S05TX17-EN		4 weeks m 5			-
25	Thesis	Thesis		MK5DIP1S30TX17-EN				0 12 m 30	-

560 Sum of Lecture Hours  
 522 Sum of Seminar Hours  
 1082 Sum of Contact Hours  
 12 Sum of Exam  
 13 Sum of Semester Mark  
 0 Sum of Sign  
 120 Credits  
 20 Mean Contact Hours per Week

<b>Summa:</b>	13	9	22	28	15	8	23	33	12	10	22	29	0	12	12	30
Exam:			4				4				4					0
Mid semester grade:			4				4				4					1
Signature			0				0				0					0

Fields of Knowledge:						
1.	2 1	Studies in construction	M A G	14	15	16 17
2.	2 3	Studies in geoinformatics	G E O	1		
3.	2 4	Studies in water building engineering	V I Z	6	7	
4.	2 7	Studies in transportation planning	K O Z	4	5	
5.	2 8	Studies in structural engineering	T A R	8		
6.	2 9	Studies in environmental sciences	K O R	10	11	13
7.	2 1 0	Studies in urban planning	T E L	2	3	18 19 20 21 24
8.	5 2	Specificity in environmental engineering	K O V	9		
9.	5 6	Environment protection technologies IV	H U G	12		
<b>Pre-master courses</b>	1	Introduction to Water Related Public Works				
	2	Introduction to Urban Design				
	3	Introduction to Urban Transportation Infrastructure Planning				
	4	Introduction to the Sustainable Use of Environmental Resource				