Urban Environment - BMEEOVKAI42

I. Subject Specification

1. Basic Data

1.1 Title

Urban Environment

1.2 Code

BMEEOVKAI42

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2
Consultation	1

1.5 Evaluation

Midterm grade

1.6 Credits

3

1.7 Coordinator

name	Dr. Kardos Máté Krisztián
academic rank	Assistant professor
email	kardos.mate@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKAI42
https://fiek2.mywire.org/course/view.php?id=3582

1.10 Language of instruction

english

1.11 Curriculum requirements

Compulsory in the Specialization in Infrastructure Engineering (BSc) programme

1.12 Prerequisites

Strong prerequisites:

- Basics of Environmental Engineering (BMEEOVKAT41)

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to introduce civil engineering students to the typical environmental and public health problems of urbanized areas. It discusses the role of the city in the development of environmental problems, as well as the root causes of the effects on air, soil, water and wildlife caused by the environmental load from the operation of the settlements, and the interventions - mainly civil engineering - to eliminate them.
Students get to know the concepts related to air pollution, highlighting the role of traffic and the formation of odors in sewer networks. Students will learn about the process of contamination of rainwater flowing from the surface of urban areas. Students gain insight into the methods of eliminating typical urban soil pollution and preventing the spread of pollution, as well as the basics of protection against noise, vibration and radiation.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Understands the basics of interactions between settlements and their environment.
2. He is aware of the hydrological characteristics of settlements and the system of civil engineering solutions for public health infrastructure.
3. He knows the air pollution problems of the settlements and the possibilities of mitigating them.
4. Knows the composition, sources, regional and periodic changes, medium and long-term effects and mitigation options of the pollution of the settlement surface.
5. Knows the types and generation of municipal waste and is aware of the basics of waste management tools.
6. You are aware of the possible sources of soil pollution in settlements, as well as the basics of pollution detection, monitoring and cleaning options.
7. You know the typical noise sources of settlements, the permissible noise levels and the methods of noise measurement. He is knowledgeable about active and passive defense solutions and noise protection plans.

B. Skills

1. Able to recognize and see through the environmental protection aspects that arise during civil engineering work in the settlement environment.

C. Attitudes

1. He cooperates with the instructor and his group mates during the expansion of knowledge.
2. He expands his knowledge by continuously acquiring knowledge, and for this he even looks for answers to his questions from web sources in addition to the mandatory course materials.

D. Autonomy and Responsibility

1. He uses the systematic approach in his thinking.
2. As a civil engineer, he feels a responsibility to work on the creation of more environmentally friendly settlements.

2.3 Methods

- Lectures with theoretical knowledge
- Written and oral communication
- Use of IT tools and techniques
- Personal consultation

2.4 Course outline

Week	Topic
1.	**Introduction**: description of the structure and requirements of the subject. Conceptual definitions. Characteristics of the urban environment, general causes of environmental problems caused by the city.
2.	**Settlement structure** and environmental protection. Steps in the development of settlements. Typical settlement structures. The concept of "green belt".
3.	**Air pollution** in settlements. Pollutants, emission sources and environmental effects. Measures to improve urban air quality.
4.	**Hydrological characteristics** of the settlements. Collection, drainage and treatment of rainwater falling on the settlement. Blue-green infrastructures at the service of the population of the settlement. Effects of climate change.
5.	Collection, drainage and cleaning of urban **wastewater**. Sewage odor problems. Engineering methods to avoid and reduce odor emissions. The basic schemes and steps of wastewater treatment, the most important artefacts.
6.	Composition and sources of contamination of the **settlement surface**. Qualitative and quantitative characterization of pollutants emitted during road and rail transport. Possible prevention (developments in vehicle technology, alternative drive modes) and mitigation (rainwater treatment) of pollution emitted by traffic.
7.	Territorial and seasonal changes in the pollution of the **settlement surface**: characteristics and description of the accumulation of pollutants during dry periods and

	their washing away during rainfall events. Medium and long-term effects.
8.	**Partial summary**
9.	**Noise and vibration**. Typical sources of noise in the settlement. Methods of noise measurement. Permissible noise levels. Active and passive defense solutions, noise protection plans.
10.	**Waste management** in settlements. The concept, types, generation and quantity of waste. Toolbox for municipal waste management. Prevention, utilization, use, treatment and final disposal. Additional activities (collection, selective collection, transport).
11.	**Mobility** and sustainability. Development of sustainable urban mobility plans (SUMP) in Hungary. Smart cities.
12.	Urban **soil pollution**. Sources, detection, monitoring. Characteristics of the spread of soil pollution, methods of preventing the spread. Soil cleaning methods.
13.	Summary.
14.	Midterm test.

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

Downloadable: presentation slides.

2.6 Other information

2.7 Consultation

During the consultation hours of the lecturers announced on the department's website, in the lecturers' room or at a time agreed in advance with the lecturer. Special appointments can be requested via e-mail from the lecturers: kardos.mate@emk.bme.hu, acs.tamas@emk.bme.hu, varga.laura@emk.bme.hu.

This Subject Datasheet is valid for:

2023/2024 semester I

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes specified in clause 2.2. above and the evaluation of student performance occurs via one written test.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Midterm test	MT	A.1-A.7; B.1; C.1-C.2; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Jele	Részarány
MT	100%
Sum	**100%**

Criterion for completion of the subject is to collect at least 50% of the total points of the written test (WT1).

3.4 Requirements and validity of signature

It is not possible to obtain a signature in this subject.

3.5 Grading system

If the student satisfies the attendance criteria, his/her mark will be determined as follows.

Grade	Points (P)
excellent (5)	80%<=P
good (4)	70%<=P<80%
satisfactory (3)	60%<=P<70%
passed (2)	50%<=P<60%
failed (1)	P<50%

The final grade is calculated based on the written midterm test (MT)

3.6 Retake and repeat

The midterm test can be repeated – once without paying a fee – at a previously determined date given in the course schedule. If the first repetition is also unsatisfactory (failed), then the test can be repeated once more, during the repetition week, by paying a fee.

3.7 Estimated workload

Activity	Hours/semester
participation at the lectures	14×2=28

preparation for the courses	14×1=14
home studying of the written material	18
preparation for the test	30
Sum	**90**

3.8 Effective date

1 September 2022

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