Water and wastewater treatment plants - BMEEOVKMV61

I. Subject Specification

1. Basic Data

1.1 Title

Drinking water and wastewater treatment plants

1.2 Code

BMEEOVKMV61

1.3 Type

Module with associated contact hours

1.4 Contact hours

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

1.5 Evaluation

Midterm grade

1.6 Credits

3

1.7 Coordinator

name	Dr. Patziger Miklós
academic rank	Associate professor
email	patziger.miklos@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKMV61
https://fiek2.mywire.org/course/view.php?id=3523

1.10 Language of instruction

english

1.11 Curriculum requirements

Recommended elective in the Specialization in Water and Hydro-Environmental Engineering (MSc) programme

1.12 Prerequisites

Recommended prerequisites:

- Water and wastewater treatment II. (BMEEOVKMF-1)

The course cannot be taken if the following course has been already completed:

- Víz- és szennyvíztisztító telepek tervezése és üzemeltetése (BMEEOVKMJ05)

1.13 Effective date

2 February 2022

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to transfer practical knowledge in the field of design and operation of drinking water and wastewater treatment plants. During the semester, we organize operational and design workshops, as well as a number of plant visits and field exercises. Invited lecturers also hold classes and consultations on issues related to operation and design of drinking water and wastewater treatment plants. The objective of the course is the practical application of the methods learned from water and wastewater treatment in the design and operation field.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Understands the main aspects and solutions of the design of drinking water treatment plants for the treatment of deep well waters
2. Is aware of practical knowledge related to the operation of drinking water treatment plants using specific technologies
3. Understands the basics of water safety planning
4. Knows the basics of sewerage and wastewater treatment
5. Knows the possible basic steps (technological units) of wastewater treatment
6. Is aware of the basic design issues of wastewater treatment plants using a given technology
7. Is aware of practical knowledge related to the operation of wastewater treatment plants using a given technology

B. Skills

1. Recognizes the main errors related to the design of wastewater treatment plants using a given technology, is able to make suggestions to solve them
2. Recognizes the main errors related to the design of drinking water treatment plants using a given technology, is able to make suggestions to solve them
3. Understands the main errors related to the operation of drinking water treatment plants using a given technology, is able to make suggestions for their solution
4. Understands the main errors related to the operation of wastewater treatment plants using a given technology, is able to make suggestions for their solution

C. Attitudes

1. Cooperates with the lecturers and the classmates
2. He/she constantly expands his/her knowledge, and in addition to the compulsory curriculum, he/she searches answers from web resources as well.

3. When preparing written documents he/she seeks to produce well-structured and clear documentation as it can be expected by the engineering profession.

D. Autonomy and Responsibility

1. Use of systematic approach in problem solving

2.3 Methods

Theoretical lectures, oral and written communication. Use of IT tools and techniques, laboratory practices. Field trips.

2.4 Course outline

Week	**Lecture / field trip topics**
1.	Water safety planning
2.	Planning process of wastewater treatment plants (participating specializations, the permission and application process, planning stages)
3.	Fluid dynamics and technological basics of design/reconstruction of wastewater treatment plant units
4.	Drinking water supply of large cities - field trip
5.	Operation of wastewater treatment plants (regional systems)
6.	Sludge treatment and biogas production - case study
7.	Visit of large wastewater treatment plant I.
8.	Visit of large wastewater treatment plant II.
9.	Visit of drinking water treatment plant - surface water treatment I.
10.	Visit of drinking water treatment plant - surface water treatment II.
11.	Design of drinking water treatment plants
12.	Energy balance of wastewater treatment plants - case study
13.	Current research issues in water and wastewater treatment I.
14.	Current research issues in water and wastewater treatment II.

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

1. Henze M., Harremoes P., Cour Jansen J. la, Arvin E. (2002) Wastewater Treatment – Biological and

Chemical Processes (Springer)
2. Water Treatment Plant Design (American Water Works Association)
3. Slides of the lectures

2.6 Other information

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail from the lecturers: (laky.dora@emk.bme.hu; patziger.miklos@emk.bme.hu)

This Subject Datasheet is valid for:

Inactive courses

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	MT1	A.1-A.7; B.1-B.4; C.1-C.3; D.1

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

3.3 Evaluation system

Abbreviation	Score
MT1	100%
Total	**100%**

3.4 Requirements and validity of signature

The signature can be obtained if at least 45% of the points is achieved in the midterm test.
At least 70% attendance at lectures and field trips is expected.

3.5 Grading system

Grade	Points (P)
excellent (5)	85<=P
good (4)	70<=P<85%
satisfactory (3)	57<=P<70%
passed (2)	45<=P<57%
failed (1)	P<45%

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
Attendance at the lectures and field trips	14×3=42
Preparation for the midterm test	48
Sum	**90**

3.8 Effective date

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