Natural wastewater treatment - BMEEOVKDT83

I. Subject Specification

1. Basic Data

1.1 Title

Natural wastewater treatment

1.2 Code

BMEEOVKDT83

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	28
Consultation	12
Field course	(1)

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Ferenc Szilágyi
academic rank	Honorary professor
email	szilagyi.ferenc@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKDT83
https://fiek2.mywire.org/course/view.php?id=2579

1.10 Language of instruction

Natural wastewater treatment - BMEEOVKDT83

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english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

Understanding the effectiveness and limitations of the different natural treatment methods. Comparison the natural treatment systems with activated sludge treatment from many aspects. Planning capabilities of such systems.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Ability to understand the operation and contaminant removal processes in these systems.
2. Basic knowledge about the advantages and disadvantages of natural treatment in comparison with common activated sludge treatment.
3. Basic knowledge about the design criteria of the different natural treatment systems.

B. Skills

1. Knows the operation of the different natural treatment systems.
2. Knows the legal background of application.
3. Understand the processes leading to decrease contaminant concentrations during the treatment process.
4. Ability to make corrections if disorder operation occurs.

C. Attitudes

1. Cooperates with the teacher and fellow students in expanding the knowledge.
2. Open to use the IT possibilities.
3. Strives for economic efficiencies.
4. Self-made expand the knowledge in the given topic.

D. Autonomy and Responsibility

1. Independently solve and consider the task and problems.
2. Open for criticism.
3. Take a systematic approach for thinking.

2.3 Methods

Lectures with theoretical knowledge. Written and oral communication. Use IT tools. Solving case study in group, literature search, field trip.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Introduction between natural treatment system and activated sludge sewage treatment.
2.	Types and characteristics of the natural treatment systems. Inter comparison among the systems based on capacity range, effectiveness and cost. Detailed experiences of sewage pond systems based on literature data.
3.	Detailed experiences of root zone treatment systems on literature data.
4.	Detailed experiences of marshland treatment systems based on literature data.
5.	Detailed experiences of sand and soil filtration systems based on literature data.
6.	Evaluation of the environmental characteristics in order to select the appropriate natural system to fit the local circumstances.
7.	Field trip to an existing natural treatment plant.
8.	Design criteria of the root-zone treatment systems.
9.	Design criteria of the pond treatment systems.
10.	Design criteria of the root-zone treatment systems. Design criteria of the pond treatment systems.
11.	Design criteria of the marshland treatment systems.
12.	Design criteria of the irrigation sewage treatment systems.
13.	Summary of the experiences of the existing natural treatment plants and comparison of their main characteristics with the activated sludge plant in the same capacity range.
14.	Oral exam.

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

2.6 Other information

2.7 Consultation

This Subject Datasheet is valid for:

Natural wastewater treatment - BMEEOVKDT83

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Exam	E	A.1-A.3; B.1-B.4; C.1-C.4; D.1-D.3

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
E	100
Sum	**100%**

3.4 Requirements and validity of signature

3.5 Grading system

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 grade is calculated based on performance in the exam.

3.6 Retake and repeat

3.7 Estimated workload

Activity	Hours/semester
Lectures	14×2=28
Literature review	1×30=30
Preparation for the exam	1×32=23
Sum	**90**

3.8 Effective date

1 September 2022

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Inactive courses