Ecology - BMEEOVKMI52

I. Subject Specification

1. Basic Data

1.1 Title

Ecology

1.2 Code

BMEEOVKMI52

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2

1.5 Evaluation

Midterm grade

1.6 Credits

3

1.7 Coordinator

name	Dr. Kozma Zsolt
academic rank	Associate professor
email	kozma.zsolt@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKMI52
https://fiek2.mywire.org/course/view.php?id=3486

1.10 Language of instruction

english

1.11 Curriculum requirements

Compulsory in the Infrastructure Engineering (MSc) programme

1.12 Prerequisites

1.13 Effective date

1 September 2017

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to provide appropriate ecological knowledge for civil engineering student, so that (i) they will be able to identify and solve simpler ecological challenges, and (ii) when dealing with more complex problems they are able to formulate adequate questions for ecological experts and can utilize the given answers. A further goal is to provide a deeper insight into difficult ecological problems through case studies.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows and understands the main concepts and tools of ecology
2. knows the fundamental ecological laws and processes
3. through case studies she/he knows the different field, methods and tools of applied ecology
4. understands the ecological impacts of human activity

B. Skills

1. she/he is able to use the concepts of ecology
2. able to understand certain ecological systems
3. able to evaluate the ecological effects of engineering activities (design, construction and maintenance of engineering structures)
4. can identify and solve simpler ecological problems, or find and communicate with the appropriate experts
5. is capable to communicate her/his thoughts and ideas in relation with ecology in a clear and structured way

C. Attitudes

1. strives to get familiarized with the tools and methods necessary to deal with ecological issues
2. aims to enforce the principles of energy efficiency and environmental awareness in her/his work

D. Autonomy and Responsibility

1. formulates and works out the solution of ecological problems on her/his own
2. applies the system theory paradigm on her/his own

2.3 Methods

Lectures, calculation exercises, verbal communication, usage of IT tools

2.4 Course outline

Hét	Előadások és gyakorlatok témaköre
1.	Comparison of temporal, spatial scales of ecological processes and engineering activities. Similarities and differences in engineering and ecological expertises. The main characteristics of ecological processes.
2.	Fundamental concepts, definitions and ideas of ecology.
3.	General behavior of ecological systems. Primary production, nutrient cycles, material and energy flows.
4.	Interactions in ecology (1): intra- and interspecific interactions. Patterns in ecology.
5.	Interactions in ecology (2): The interactions between populations and their environmental. Principle of limitation and its applications.
6.	Biogeochemical flows. The hydrological cycle. Human impacts on natural cycles.
7.	Overview of the first six lectures.
8.	Bioindication, biomagnification, biomonitoring. Case studies.
9.	Ecological aspects of water management. Wetlands and their characteristics. Engineering impacts on wetlands, ecological effects of hydraulic structures.
10.	Ecological aspects of hydromorphological interventions. Aims and design principles. Technological solutions, international case studies. Comparison of classical engineering and ecological solutions.
11.	Nature based solutions in wastewater management.
12.	Ecological and environmental problems from human activities (1): agriculture, forestry, industry and mining. Possible solutions.
13.	Ecological and environmental problems from human activities (2): infrastructure and tourism. Possible solutions.
14.	Final 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

- Lecture slides and recordings. Supplementary materials on the course webpage.
- Ellis, E.C., Kaplan, J.O., Fuller, D.Q., Vavrus, S., Goldewijk, K.K., Verburg, P.H (2013) Used planet: A global history. Proceedings of the National Academy of Sciences May 2013, 110 (20) 7978-7985; https://doi.org/10.1073/pnas.1217241110
- Ellis, E.C. (2015) Ecology in an anthropogenic biosphere, Ecological Monographs, 85(3), 2015, pp. 287–331, https://doi.org/10.1890/14-2274.1

2.6 Other information

2.7 Consultation

After appointment with the lecturers.

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 learning results listed in section 2.2 will be checked in a final test on the last week of the semester.

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
final test	T1	A.1-A.4; B.1-B.5; 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
T1	100%
Összesen	**100%**

3.4 Requirements and validity of signature

Students must reach at least 50% on the final test in order to get the signature.

3.5 Grading system

Érdemjegy	Pontszám (P)
jeles (5)	80%<=P
jó (4)	70%<=P<80%
közepes (3)	60%<=P<70%
elégséges (2)	50%<=P<60%
elégtelen (1)	P<50%

3.6 Retake and repeat

The retake of the final test is only possible on the retake week.
The first retake attempt is free. Always the last result count.
There is a fee for the second retake attempt.

3.7 Estimated workload

Tevékenység	Óra/félév
attendance at the lectures	14×2=28
preparation for the test	62
Összesen	**90**

3.8 Effective date

1 September 2021

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