Design of Water Use Structures - BMEEOVVMV61

I. Subject Specification

1. Basic Data

1.1 Title

Design of Water Utilisation Structures

1.2 Code

BMEEOVVMV61

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

4

1.7 Coordinator

name	Dr. Csoma Rózsa
academic rank	Associate professor
email	csoma.rozsa@emk.bme.hu

1.8 Department

Department of Hydraulic and Water Resources Engineering

1.9 Website

https://epito.bme.hu/BMEEOVVMV61
https://fiek2.mywire.org/course/view.php?id=3537

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 Damage Prevention, Water Utilisation (BMEEOVVMV61)
- Hydraulic Engineering Project Work (BMEEOVVA-FP)

1.13 Effective date

2 February 2022

2. Objectives and learning outcomes

2.1 Objectives

The course introduces the hydraulic engineering structures for water level regulation, their hydrological, hydraulic, soil mechanical, structural, constructional and operational problems and their solution possibilities demonstrated with a design project.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. to be aware of the general terminology of water level regulation structures,
2. to be aware of the most important methods in the field of hydraulic engineering structures, and their application possibilities
3. to be aware of the basic relationships stability and safety in case of large hydraulic engineering structures
4. to be aware of the basic concepts of the seepage calculations around structures
5. to be aware of the most important aims of water level regulation structures in Hungary and all over the world

B. Skills

1. to be able to choose the best structure for a given aim of water utilisation, based on the comparison of their advantages and disadvantages,
2. to be able to identify and analyse the hydraulic process going on in compound systems of structures, and to choose the best method available for the dimensioning
3. to be able to determone seepage parameters around structures
4. to be able to prove the stability of river barrages,
5. based on the knowledge collected in the field of informatics to be able to solve problems of medium size computational requirements,
6. to be able to present the results in clear technical drawings,
7. to be able to present his/her results in proper written form,

C. Attitudes

1. to collaborate with the teachers and his/her mates in gaining knowledge,
2. to follow the lectures, to make effort to understand the study material,
3. to be open to the use of IT tools and equipment
4. to strive for the proper identification of water level regulation problems and their proper solution,
5. to strive for accuracy in his/her calculations/solutions,
6. to realize the importance of the effects of human activities on the environment.

D. Autonomy and Responsibility

1. to be independent in problem statements and solutions in case of water level regulation problems,
2. to be open to careful and deep going critique,
3. to understand the complexity, comprehensiveness of the problems and recognizing the synergies.

2.3 Methods

Theoretical lectures, design guidelines and continuous consultation, oral and written communication, the application of IT tools and technics, to prepare a larger project work, the organisation of the work.

2.4 Course outline

Hét	**Előadások és gyakorlatok témaköre**
1.	The aim of water level regulation, the most important types of structures in Hungary, and around the world, introduction of the design work
2.	Main parts of the water level regulation structutes, the control of flood capacity
3.	Hydraulical backgrounds
4.	The control of the stilling basin
5.	Supplementary elements of the structure
6.	Preliminary dimensioning, preliminary design
7.	The discussion on the preliminary design
8.	Stability of the structure: loads and resistance, design conditions, uplift and sliding
9.	Seepage around the structure, The control of the hydraulic stability
10.	Soil reaction, connections to the designers of other specializations (steel, RC)
11.	Soil reaction. connections to the designers of other specialization (steel, RC)
12.	Drawings of the project
13.	Written elements of the project, the contents of the technical description
14.	Summary

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

a) Textbooks:

1. CHANSON, Hubert: The Hydraulics of Open Channel Flow: An Introduction. Elsevier, 2004.
2. CHANSON, Hubert: Energy Dissipation in Hydraulic Structures. CRC Press, 2020.

b) Online materials: materials uploaded to the web site of the subject, e.g.:

1. Lecture notes, electronic lecture notes,

2. Slides of lectures and practices,:

2.6 Other information

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website at the beginning of the semester.

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 midterm presentation, a test and the final project work.

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
presentation of the preliminary design	PREZ	A.1-A.2; B.1-B.2, B.5-B.7; C.1, C.4; D.1-D.2
Project work	HW	A.1-A.5; B.1-B.7; C.1-C.6; D.1-D.3
Midterm test	T	A.1-A.5; B.1-B.4; C.2
Activity during the classes	A	A.1; B.7; C.1-C.6; 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

Jele	Részarány
Prez	10
HW	55
T	25
A	10
Összesen	**100%**

3.4 Requirements and validity of signature

No signature can be obtained.

3.5 Grading system

At least 70% of the attendance of lectures and seminars are expected.
In case of fulfilling the attendance requirements and project work assignments with the grade at least „satisfactory", the final grade is the average value of the grade of the presentations and the homework assignments and the class activity weighted according to the clause 3.3.

3.6 Retake and repeat

1. The project work – after the payment of the fee as described in the Regulations – can be submitted with delay until the last day of the supplementary week, until 12:00 a.m..
2. The submitted and accepted homework can be corrected without any fee until the deadline described in the point 1.
3. The two midterm presentations have no minimum requirements, therefore they cannot be retaken.
4. "Class activity" A cannot be repeated, cannot be substituted with other forms of activity.

3.7 Estimated workload

Activity	**Hours/semester**
Contact hours	14×3=42
Preparation for the classes	5
Preparation for the presentations	23
Project work	45
Home studying of the written material	5
Sum	**120**

3.8 Effective date

2 February 2022

This Subject Datasheet is valid for:

Inactive courses