

I. Subject Specification**1. Basic Data***1.1 Title***WATER UTILISATION, MATER DAMAGE PREVENTION***1.2 Code***BMEEOVVA-F1***1.3 Type*

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	4

1.5 Evaluation

Exam

1.6 Credits

5

1.7 Coordinator

name	Sándor Baranya
academic rank	Associate professor
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1.8 Department

Department of Hydraulic and Water Resources Engineering

1.9 Website<https://epito.bme.hu/BMEEOVVA-F1><https://edu.epito.bme.hu/course/view.php?id=5210>*1.10 Language of instruction*

english

1.11 Curriculum requirements

Compulsory in the Specialization in Infrastructure Engineering (BSc) programme

1.12 Prerequisites

Required previous subjects (need to be completed to register)

Hydrology 2 (BMEEOVVAI41)

Subjects from which previous midterm signature are required to register

Hydraulic Engineering, Water Management (BMEEOVVAT43)

Hydraulics 2 (BMEEOVVAI42)

1.13 Effective date

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to transfer knowledge about the methods of river engineering, flood defence, lowland and hillside water management, hydropower utilization, fluvial navigation, agricultural water utilization. The course also provides the theoretical basis for the follow-up course called Hydraulic Engineering Design Project.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Knows the basic flow and sediment transport processes, and morphological features of streams
2. Knows the regulation methods of gullies, torrents, creeks and rivers, together with the most relevant design principles and technical features.
3. Understands the basic concepts of flood defence, knows the methods of flood damage mitigation and the technical solutions of flood defence.
4. Understands the operation principles, the technical features and the most important design phases of flood protection dikes, weirs, dams,
5. Knows the basic principles of hydropower utilization, the set-up, function and operation principles of hydraulic structures, and able to perform the basic hydrologic and hydraulic calculations to support hydropower use.
6. Knows the technical solutions of lowland and hillside water management, the operation and design principles of drainage systems.
7. Knows the technical solutions, design and operation principles of irrigation systems.
8. Knows the basic principles of fluvial navigation, the technical methods of waterway management, the operation and design principles of waterway related hydraulic structures.

B. Skills

1. Adequate use of the concepts of water damage prevention and water use.
2. Ability to make recommendations on engineering measures for stream regulation.
3. Ability to perform a feasibility study of a flood defence dyke.
4. Ability to determine the basic data need of a hydropower utilization plan, ability to perform the basic hydrologic-hydraulic calculations of hydropower utilization. Ability to perform the design calculations of a drainage system.
5. Ability to perform the design calculations of an irrigation system.

C. Attitudes

1. Open to connect the gained knowledge with other disciplines (e.g. environment protection, economy)
2. Aims to apply the gained knowledge in practice.
3. Open to reveal literature related to the course.

D. Autonomy and Responsibility

1. Applies the system thinking approach.

2.3 Methods

Lectures

2.4 Course outline

Week	Topics of lectures and/or exercise classes	
1.	Tasks of water damage prevention. Basics of stream morphology.	
2.	River regulation: Causes, methods.	
3.	Flood defence: principles, flood management.	
4.	Flood defence system and typical floods in Hungary.	
5.	Methods and tools of flood defence (e.g. dykes, dams, reservoirs)	
6.	Weirs and barrages. Water storage. Water transfer.	
7.	Hydropower utilization I.: Possibilities of hydropower utilization.	
8.	Hydropower utilization II.: Methods and tools of hydropower utilization.	
9.	Water drainage I.: Lowland and hillside drainage.	
10.	Water drainage II.: Groundwater drainage.	
11.		

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	Agricultural water utilization I.: Irrigation methods.	
12.		
	Agricultural water utilization II.: Irrigation tools. Fishponds, la	
13.		
	Fluvial navigation I.: Ships, basic concepts of navigation and w	
14.		
	Fluvial navigation I.: Hydraulic structures of waterways, harbor	

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. PPT presentations.

2.6 Other information

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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:

2025/2026 semester II

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 midterm test and oral examination.

3.2 Assessment methods

Evaluation form	abbrev.	assessed learning outcome
1st midterm test	ZH	A.1-A.4, B.2-B.3
oral examination	V	A.5-A.8, B.1, B.4-B.6, C.1

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

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3.3 Evaluation system

abbreviation	score
ZH	50%
Total achievable during the semester	50%
V	50%
Sum	100%

3.4 Requirements and validity of signature

Participation on, at least, 70% of the seminars and pass the test in the midterm period.

3.5 Grading system

The final grade will be calculated, once the requirements of 3.4 are met, based on the grade of the midterm test and the grade of the oral exam in the examination period.

3.6 Retake and repeat

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1) The midterm test can be repeated (free of charge for the first time). New grade replaces the old one. Time of repeat will be given in the detailed semester schedule.

2) Should the repeat fail, a second attempt can be made, paying the fee according to regulations. Time of repeat will be given in the detailed semester schedule.

3.7 Estimated workload

activity	hours/semester
contact hours	14×4=56
preparation for the tests	42
home studying of the written material	10
preparation for the examination	42
in total	150

3.8 Effective date

1 September 2017

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2025/2026 semester II