Hydraulic Engineering Design Project - BMEEOVVA-QP

I. Subject Specification

1. Basic Data

1.1 Title

Hydraulic Engineering Design Project

1.2 Code

BMEEOVVA-QP

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Consultation	2

1.5 Evaluation

Midterm grade

1.6 Credits

6

1.7 Coordinator

name	Dr. Tamás Krámer
academic rank	Associate professor
email	kramer.tamas@emk.bme.hu

1.8 Department

Department of Hydraulic and Water Resources Engineering

1.9 Website

https://epito.bme.hu/BMEEOVVA-QP
https://edu.epito.bme.hu/course/view.php?id=3603

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Specialization in Infrastructure Engineering (BSc) programme

1.12 Prerequisites

Strong prerequisites (must have completed):

- EODHAI41 Infrastructure Study Project

Weak prerequisites (must obtain signature):

- EOVVA-F1 Water Damage Prevention and Water Use

Parallel prerequisites (must have completed earlier, or completing in the same semester):

- EOVVA-F2 River Basin Management

1.13 Effective date

1 September 2023

2. Objectives and learning outcomes

2.1 Objectives

The objective of the course is that the student gains experience in solving water damage and water use problems through the preparation of a complex water damage prevention and water use plan, putting into use the methods taught in the prerequisite subjects.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Synthese information acquired during prior learning.

B. Skills

1. Can prepare a preliminary hydrological plan and lay the foundations for a detailed hydrological plan.
2. Can design a drainage system for a simple inland flooding.
3. Is able to design an irrigation system for a medium sized area.
4. Can design a simple water intake structure.
5. Is able to control the stability of a flood protection main protection line.
6. The ability to document the design and related calculations in an orderly manner in the technical specifications, calculations and drawings, in the manner expected of an engineer, and to express his/her ideas on the design in a professional manner.

C. Attitudes

1. Cooperates with the instructor in the development of his/her knowledge.
2. Extends his/her knowledge through continuous learning.
3. Is open to the use of information technology tools for the preparation of plans and the calculations on which they are based.
4. Strives to learn and routinely use the tools needed to solve problems in hydraulic engineering.
5. Works accurately and without errors.
6. Strives to apply the principles of energy efficiency and environmental awareness in solving hydraulic engineering problems.

D. Autonomy and Responsibility

1. Independently thinks through hydraulic engineering tasks and problems and solves them on the basis of given resources.
2. Is open to well-founded critical comments.
3. Applies a systems approach to thinking.

2.3 Methods

The student must complete individually a complex homework exercise with loosely interdependent subtasks, assisted by consultations with the lecturers. A written documentation must be produced, IT must be used and work must be organised so that midterm milestones are met.

2.4 Course outline

The student will design utilisation and water damage control facilities associated with a lowland, dammed river section and the adjacent inland floodplain. Based on individual input data, the student

- prepares a hydropower management plan for a dam,
- designs a farmland drainage network,
- designs an irrigation system and the river intake structure that supplies it,
- designs a model cross-section for a flood protection levee along the river.

All assignments and input data are available at the start of the semester. As this is a consultation-type course, each student can progress at their own pace, but midterm milestones must be met.

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. Mosonyi, E.: Water Power Developments Vol.1. Low Head Power Plants. Akadémiai Kiadó, Budapest, 1987.

b) Lecture notes and slides

1. Those of the prerequisite subjects

c) Online material

1. Students' individual assignments and solution guides to the tasks on the subject's web page

d) Recommended literature

1. US Bureau of Reclamation (1993) - Drainage manual. https://www.usbr.gov/tsc/techreferences/mands/mands-pdfs/DrainMan.pdf
2. B.C. Sprinkler Irrigation Manual (2014). https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/water/irrigation/sprinkler-irrigation-manual
3. The International Levee Handbook. https://webissimo.developpement-durable.gouv.fr/IMG/pdf/A_The_International_Levee_Handbook_C731__cle7f8a33.pdf
4. US Army Corps of Engineering (1989) - Hydropower. Publication EM 1110-2-1701. https://www.publications.usace.army.mil/LinkClick.aspx?fileticket=i95PzC5j8uI%3d&tabid=16439&portalid=76&mid=43544

2.6 Other information

None.

2.7 Consultation

The lecturers will display their individual weekly consultation times at the beginning of the semester.

This Subject Datasheet is valid for:

2024/2025 semester II

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

Learning outcomes are evaluated based on the documented results of the semester homework project.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Homework project	HW	A.1; B.1-B.6; 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

Abbreviation	Score
HW	100%
Sum	**100%**

3.4 Requirements and validity of signature

No signature can be obtained.

3.5 Grading system

The final grade is the grade (1-5) given to the homework. The following aspects are graded (1-5) and a weighted average is calculated.

Aspect	Weight
Task 1 - Hydropower	22%
Task 2 - Levee	16%
Task 3 - Drainage	22%
Task 4 - Irrigation	22%
Task 5 - Siphon	11%
Technical description	7%
Sum	**100%**

3.6 Retake and repeat

1. The student may submit the homework past the deadline until the last day of the repeat period at 12 pm (noon). A late fee is due.
2. The student may improve his/her homework and resubmit it until the deadline set out in (1), without paying any extra fee.

3.7 Estimated workload

Activity	**Hours/semester**
Execution of homework	170
Consultations (incl. preparation)	10
Sum	180

3.8 Effective date

1 September 2023

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