

I. Subject Specification

1. Basic Data

1.1 Title

Infrastructural Design Project

1.2 Code

BMEEODHAI41

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 | Attila Kollár |
| academic rank | Assistant professor |
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1.8 Department

Department of Highway and Railway Engineering

1.9 Website

<https://epito.bme.hu/BMEEODHAI41>
<https://edu.epito.bme.hu/course/view.php?id=3591>

1.10 Language of instruction

english

1.11 Curriculum requirements

Compulsory in the Specialization in Infrastructure Engineering (BSc) programme

1.12 Prerequisites

Hydraulic Engineering, Water Management (BMEEOVVAT43) - weak

Highway and Railway Design (BMEEOUVAI43) - weak

Public Works II. (BMEEOVKAI41) - weak

1.13 Effective date

1 September 2023

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to convey a comprehensive and complex design approach. The task specification is based on a small urban area. The main infrastructural facilities, road network, water utilities, as well as the overall water management of the micro-region are to be planned.

The planning task is to be developed in the following steps:

- micro-regional concept covering all disciplines,
- detailed plans of the designated parts of the individual disciplines up to the level of design for approval,
- detailed design of designated parts with bill of quantities.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. is familiar with the steps of synthesizing simple planning procedures used in road design,
2. knows the calculation and design steps used in pavement reinforcement design,
3. has the knowledge on the steps of simple public utility planning procedures,
4. is aware of of simple water management questions.

B. Skills

1. is able to define the number of traffic lanes based on traffic data,
2. can develop a suitable pavement structure based on estimated future traffic data,
3. is able to prepare road construction plans and traffic engineering plans of an urban road at 'plan for approval' level, based on previous studies,
4. is able to perform hydraulic engineering design task based on previous studies,
5. is able to perform utility planning tasks based on previous studies,
6. is able to express his thoughts in an orderly form orally, in writing and in standard planning work sections.

C. Attitudes

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1. cooperates with the instructor during consultations,
2. is open to the professional use of IT tools,
3. strives to learn and skillfully use the tools and techniques required to solve the design problem,
4. strives for accurate and precise task solutions,
5. during the preparation of the tasks, he/she tries to produce work that is accurate and comprehensible, has an orderly appearance, that is expected at an engineering standard,
6. during the preparation of the tasks, he/she tries to implement the principles of sustainability, integrated planning and environmental awareness.

D. Autonomy and Responsibility

1. thinks through planning tasks and problems and solves them based on given resources,
2. accepts well-founded critical comments with an open mind,
3. applies the systematic approach in his/her thinking,
4. prepares well for the consultations in order to make the consultations smoother,
5. makes a responsible decision in relation to the frequency of appearances in consultation hours, in accordance with his abilities and prior preparation, in order to fulfill the tasks at the expected level.

2.3 Methods

During the consultation, assistance in solving planning tasks (for connecting previously learned elements into a project), verbal communication, and individual homework assignments prepared in teamwork or independently.

2.4 Course outline

| Week | Topics of lectures and/or exercise classes |
|------|--|
| 1. | <u>Roads</u> : Assignment, Task description Traffic planning: capacity analysis of the intersection: number of lanes |
| 2. | <u>Hydraulic Engineering</u> : Assignment, Task description |
| 3. | <u>Roads</u> : Center line on site plan; Sample cross-sections (drafts) |
| 4. | Hydraulic Engineering – Milestone 1 Consultation |
| 5. | Hydraulic Engineering – Milestone 1, second deadline <u>Roads</u> – Milestone 1: Edge of pavements <u>Roads</u> : Long-section design, pavement structure design, cross-sections |
| 6. | Hydraulic Engineering – Milestone 2 |

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| | |
|-----|---|
| | Roads – Milestone 1, second deadline |
| 7. | Hydraulic Engineering – Milestone 2, second deadline Consultation |
| 8. | Roads – Milestone 2: profile&cross-sections Roads: Content of the authorization plan |
| 9. | Public works: Assignment, Task description Roads – Milestone 2, second deadline |
| 10. | Hydraulic Engineering – Milestone 3 Consultation |
| 11. | Public works – Milestone 1 Hydraulic Engineering – Milestone 3, second deadline |
| 12. | Public works – Milestone 1, second deadline Consultation |
| 13. | Consultation |
| 14. | Submission |

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

Study-aids, guidelines and downloadable materials as specified in the class, technical specifications

2.6 Other information

Due to the special nature of the subject, participation in consultation classes is not mandatory. Failure to participate in no way exempts the student either from solving the tasks to an appropriate standard, or from lack of knowledge presented in the consultation classes.

2.7 Consultation

The teachers are available for consultation during their office hours, as advertised at the department website.

This Subject Datasheet is valid for:

2024/2025 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 three separate homeworks.

During the semester, there is a continuous partial performance evaluation (6 milestones).

Completion of the milestones is mandatory, and upon successful completion of the predetermined requirements, the student will receive a separate signature for each one.

Homeworks can only be submitted if all milestones have signatures. Otherwise, the course cannot be passed.

The student passes if all homeworks have received at least satisfactory (2) marks.

3.2 Assessment methods

| Evaluation form | Abbreviation | Assessed learning outcomes |
|--|---------------------|--|
| 1. Hydraulic engineering (with continuous partial performance evaluation - 3 milestones) | HW1 | A.4; B.4; C.1-C.6; D.1-D.5 |
| 2. Highway engineering (with continuous partial performance evaluation - 2 milestones) | HW2 | A.1, A.2; B.1-B.3, B.6; C.1-C.6; D.1-D.5 |
| 3. Public works (with continuous partial performance evaluation - 1 milestone) | HW3 | A.3; B.5; C.1-C.6; D.1-D.5 |

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 |
|---------------------|--------------|
| HW1 | 33.3% |
| HW2 | 33.3% |
| HW3 | 33.3% |
| Sum | 100% |

3.4 Requirements and validity of signature

Signature cannot be obtained.

3.5 Grading system

| Grade | Points (P) |
|------------------|----------------------|
| excellent (5) | $90 \leq P$ |
| good (4) | $75 \leq P < 90\%$ |
| satisfactory (3) | $62.5 \leq P < 75\%$ |
| passed (2) | $50 \leq P < 62.5\%$ |
| failed (1) | $P < 50\%$ |

3.6 Retake and repeat

All milestones have an additional deadline, (usually 1 week after the regular deadline) in accordance with the detailed [semester schedule](#), in addition to paying the fee specified in the regulations. Only work submitted before the given deadline can receive a signature. Furthermore, no corrections can be made after the additional deadline, so if the submitted work does not meet the minimum requirements, it cannot get a signature.

Homeworks can be handed in late (usually 1 week after the regular deadline) in accordance with the detailed [semester schedule](#), in addition to paying the fee specified in the regulations. Submitted and accepted homework can be corrected free of charge by the last deadline.

3.7 Estimated workload

| Activity | Hours/semester |
|---|---------------------|
| Contact hours | $2 \times 14 = 28$ |
| Preparation for the courses with Homework | $2 \times 76 = 152$ |
| Sum | 180 |

3.8 Effective date

26 January 2024

This Subject Datasheet is valid for:

2024/2025 semester II