

SUBJECT DATASHEET

I. SUBJECT SPECIFICATION

1 BASIC DATA

1.1 Title

ROADS

1.2 Code

BMEEOUVAT42

1.3 Type

Module with associated contact hours

1.4 Contact hours

type	hours/week
lectures	2/week
seminars/exercise classes	0/week

1.5 Evaluation

midterm

1.6 Credits

2

1.7 Coordinator

name: KISGYÖRGY, Lajos
academic rank: associate professor
email: kisgyorgy.lajos@epito.bme.hu

1.8 Department

Department of Highway and Railway Engineering (<http://www.epito.bme.hu/uvt>)

1.9 Website

<http://www.epito.bme.hu/BMEEOUVAT42>

1.10 Language of instruction

Hungarian and English

1.11 Curriculum requirements

Compulsory in the Structural engineering (BSc) programme

1.12 Prerequisites

Railway Tracks (bMEEOUVAT41)

1.13 Effective date

September 1, 2017.

2 OBJECTIVES AND LEARNING OUTCOMES

2.1 Objectives

The objective of the subject is to present a general overview of the road design and road construction field including transportation systems, mobility and sustainable transportation. The

processes of design and planning is discussed to understand how the idea becomes to reality in case of roads. Basics of road dynamics with details and procedures of alignment and junction design is discussed here with typical solutions of junctions, crossings and intersections. The most important details of traffic engineering with traffic safety studies are parts of the subject as well as the most important chapters of urban transportation, pavement materials, requirement and design of pavement structures with dewatering systems, earthworks and maintenance technologies.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. will learn the nomenclature of the road transportation branch,
2. will learn the basic guidelines of transportation policies,
3. will learn the design process and its elements,
4. will learn the principles of road alignment design,
5. will learn the types of intersections with the principles of their design,
6. will learn the principles of road traffic signs,
7. will learn the definitions, methods and phenomena describing road traffic,
8. will learn the basics of traffic safety analysis,
9. will learn the basic context and the elements of urban transportation,
10. will learn the materials and types of pavement structures,
11. will learn the basics of design of pavement structures,
12. will learn the basic construction and maintenance technologies.

B. Skills

1. will be able to prepare a simplified authorization plan,
2. will be able to design the horizontal alignment based on his/her own choice of parameters,
3. will be able to design the vertical alignment based on the horizontal alignment,
4. will be able to design sample cross sections and cross sections based on the alignment,
5. will be able to draw the basic configurations of at-grade intersections and name the elements,
6. will be able to draw the basic configurations of multi-level intersections and name the elements,
7. will be able to do simple assessments of design problems,
8. will be able to design an asphalt pavement structure.

C. Attitudes

1. cooperates with the lecturer and with fellow students,
2. is intent on understanding and learning the concept, the principles and the design of roads and transportation,
3. is intent on precise and error-free problem solving,

D. Autonomy and responsibility

1. is open to the new information and fact-based critics,
2. is aware of the relevance of deadlines, is intent to keep them,
3. is able to think in system.

2.3 Methods

Lectures, exercises, written and oral communications, application of IT tools and techniques, assignments solved individually.

2.4 Course outline

week: Topics of lectures and/or exercise classes

1. Introduction. History of road transportation. Transportation systems, sustainable transportation. Planning and design process, phases. Functional de-

- sign.
2. Elements and design of cross-sections. Design patterns. Typical layers of pavements, drawing a sample cross-section.
 3. Elements and design of the horizontal alignment. Drawing of a curve with symmetrical transition curves.
 4. Elements and design of the vertical alignment. Spatial coordination, super-elevation runoff.
 5. Application of superelevation transition in a transition curve. Drawing cross-sections. Finalization of the site plan and the long section.
 6. Parameters of road traffic: traffic volume, speed and density. Capacity calculations and considerations. Traffic safety analysis.
 7. Traffic management. Road signs and signalized intersections.
 8. Capacity calculations and requirements of intersections. At-grade junctions and their design.
 9. Roundabouts and multi-level intersections.
 10. Urban transportation. Pedestrians, cyclists, obstacle-free spaces. Public transportation, parking, traffic management of city centers.
 11. Materials, production and construction of asphalt pavements. Damages and maintenance of asphalt pavements.
 12. Design methods of asphalt pavement structures: design volume and courses of pavements. Load bearing capacity of earthworks. Standard pavement structures, reconstruction of existing pavement structures.
 13. Invited lecture 1: "The design process in a real road design project".
 14. Invited lecture: 2 "CAD softwares – the same projects with enhanced tools".

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*

Downloadable materials:

1. KISGYÖRGY, L.: Roads, 2015 (<http://www.epito.bme.hu/BMEEOUVAT42>)
2. Other materials on the website of the subject (www.oktatas.epito.bme.hu)

2.6 *Other information*

2.7 *Consultation*

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

II. SUBJECT REQUIREMENTS

3 ASSESSEMENT 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 tests and projects.

3.2 Assessment methods

Evaluation form	abbrev.	assessed learning outcomes
midterm test 1	ED1	A1-A4; B2-B4; B7
midterm test 2	ED2	A6-A8; B6-B7
midterm test 3	ED3	A5; B6-B7
midterm test 4	ED4	A9-A12; B7-B8
project 1	P1	A3-A6; B1-B4
project 2	P2	A3-A6; B1-B4

The dates of midterm tests can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

abbreviation	score
ED 1-4	60%
P 1-2	40%
Sum	100%

Criterion for completion of the subject is to collect at least 50% of the total points of the Tests plus 50% of the total points of the projects. Unsatisfactory performance during the tests or the projects will lead to a final mark 'failed' (1) independently of the results of the Test and Assignment.

3.4 Requirements and validity of signature

Criterion for the signature is to collect at least 50% of the total points of the Test and 50% of the points of the projects according to Section 3.3.

The previously acquired total points of the tests or the projects can be taken into account in the next 6 semesters.

3.5 Grading system

If the student satisfies the attendance criteria, his/her mark will be determined as follows.

The mid-semester result will be determined on the basis of point 3.3 above. The final mark is calculated on the basis of the sum of the points of the Tests and the Projects, as shown in the following table:

grade	performance (P)
excellent (5)	$80 \leq P$
good (4)	$70 \leq P < 80\%$

satisfactory (3)	$60 \leq P < 70\%$
passed (2)	$50 \leq P < 60\%$
failed (1)	$P < 50\%$

3.6 *Retake and repeat*

- 1) No single tests can be failed, since there is no minimum requirement for one test itself. However, the test performance (sum of the points of the four tests) must be at least 50 % as an average.
- 2) If the test performance calculated from the points collected on the four tests is unsatisfactory, then one of the tests can be retaken on the repetition week.

3.7 *Estimated workload*

activity	hours/semester
contact hours	$14 \times 2 = 28$
preparation for the tests	$4 \times 3 = 12$
home studying of the written material	$2 \times 10 = 20$
in total	60

3.8 *Effective date*

September 1, 2017.