

I. Subject Specification**1. Basic Data***1.1 Title***ROAD SAFETY***1.2 Code***BMEEOUVMSFIN06-00***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

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1.8 Department

Department of Highway and Railway Engineering

1.9 Websiteepito.bme.hu<https://edu.epito.bme.hu/course/view.php?id=5252>*1.10 Language of instruction*

hungarian

1.11 Curriculum requirements

Compulsory in the Highway and Railway Engineering (MSc) programme

*1.12 Prerequisites**1.13 Effective date*

1 September 2025

2. Objectives and learning outcomes

2.1 Objectives

The course introduces students to the basic concepts and evaluation methods of road safety. Students must learn about and interpret road safety indicators. During the semester, students should learn about and master the process of surveying traffic safety and apply modern methods. As a result, students should get a comprehensive picture of both the tools and possibilities of road safety and the operation and limitations of calculation procedures.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Is aware of the concepts and definitions related to road safety. 2. Has an overview of the statistical indicators describing the Hungarian and international road safety situation. 3. Is familiar with the basic design methods of safe road infrastructure. 4. Is aware of the design requirements of self-explanatory road design and forgiving road environment. 5. Has an overview of the characteristics of vehicles that are important for road safety. 6. Is aware of the characteristics of road users' behaviour and human factors. Is aware of the methods of analysing traffic behaviour. 7. Is familiar with the strategies, objectives and related road infrastructure safety management engineering tasks. 8. Has an overview of the methods of on-site road safety investigations.

B. Skills

1. Is able to interpret traffic safety statistical data and the indicators that can be derived from them. 2. Can apply the basic planning methods of safe road infrastructure. 3. Uses the principles of self-explanatory road design during infrastructure design. 4. Uses the principles of a forgiving road environment during infrastructure design. 5. Is able to apply methods of surveying traffic behaviour. 6. Explores traffic safety problems of specific locations in a structured way based on the methodology. 7. Can develop proposals to improve traffic safety based on an investigation carried out at a given location. 8. Uses the concepts and definitions of traffic safety professionally.

C. Attitudes

1. Cooperates with the lecturer and with fellow students. 2. Continuously extends his/her knowledge and professional vocabulary through continuous learning. 3. Participates actively in classes, shares his/her opinion and is open to listening to the opinions of others. 4. Develops precise problem-solving skills. 5. In his/her speeches, he/she strives for precise, professional wording.

D. Autonomy and Responsibility

1. Prepares for class as needed, based on prior instructions from the instructor, using the provided course materials. 2. Prepares responsibly for performance evaluations and successful completion of assignments. 3. Monitors legislative, technical, technological and administrative changes related to the field. 4. Independently conducts a traffic safety audit of a given location and develops proposals to eliminate problems.

2.3 Methods

In addition to regular contact classes, extracurricular tasks help students acquire the subject's competencies.

2.4 Course outline

Lectures: 1. Scope of road safety problem. Safety trends in EU and in Hungary. 2. Data collection methods, EU and Hungarian statistical databases. Road Safety indicators (absolute, relative and performance indicators) 3. Vehicle's active and passive safety systems. Automated vehicle systems. 4. Requirements of safe infrastructure. Forgiving Road Environment. 5. Self-explaining road environment design. Role of speed. 6. Human factors. Behaviour of drivers, cyclists and pedestrians. Characteristics of vulnerable road users. 7. 1st mid-term test 8. Road Safety Management, personal and social. Managing the risks. Road risk analysis tools. 9. Safety audit. 10. Redesign of road layout – case studies. Micromobility and Road Safety 11. Design safe cyclist network. Design of safe motorcyclist roads 12. Accident analysis with forensic tools 13. Safety aspect of ITS and C-ITS services 14. 2nd mid-term test Practical lessons and assignments: 1. Evaluation of road safety indicators in EU and in Hungary. 2. Preparing a geographical heat map of accidents. 3. Measurement of traffic flow characteristics. 4. Measurement of blind spot. 5. Analysis of car following distance and time gap. 6. Practice of road safety audit. 7. Presentation of assignments.

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. Documents that can be downloaded from the course website (lecture slides, data, etc.) 2. PIARC (World Road Association): Road Safety Manual – third edition, June 2024 <https://roadsafety.piarc.org/en> 3. Evangelos Bekiaris, Marion Wiethoff, Evangelia Gaitanidou – Infrastructure and Safety in a Collaborative World, Road Traffic Safety, Springer 2011, DOI: 10.1007/978-3-642-18372-0 4. Christina M. Rudin-Brown, Samantha L. Jamson – Behavioural Adaptation and Road Safety, CRC Press 2013, ISBN: 978-1-4398-5667-3 5. Dominique Lord, Xiao Qin, Srinivas R. Geedipally – Highway Safety Analytics and Modeling, Elsevier, ISBN: 978-0-12-816818-9 6. Elvik, Høy, Vaa, Sørensen – The Handbook of Road Safety Measures, Emerald, 2009, ISBN: 978-1-84855-250-0

2.6 Other information

Attendance at lectures is 70% mandatory. Students absent from four or more sessions will not be able to obtain the semester credits.

2.7 Consultation

Teachers are available for consultation during their office hours, as advertised on the department website and on the semester schedule.

This Subject Datasheet is valid for:

II. Subject requirements**Assessment and evaluation of the learning outcomes****3.1 General rules**

The assessment of learning outcomes is specified in clause 2.2. is based on active participation in lectures, the overall result of semester assignment, and the result of mid-term tests.

3.2 Assessment methods

Assessment Name (Type)	Code	Assessed Learning Outcomes
Mid-term test 1	MT1	A.1-6. B.1,8. C.2. D.1-2.
Mid-term test 2	MT2	A.5-8. B.1, 6-8. C.2. D.1-2.
Assignments (homework)	HW	A.1-2,5-6,8. B.1,2,5-8. C.3-5. D.4.

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

3.3 Evaluation system

Code	Weight
MT1	20%
MT2	20%
HW	60%
Total	100%

3.4 Requirements and validity of signature

The subject's completion criterion is to collect at least 50% of the total points of the Tests plus 50% of the total points of the Assignments (homeworks). Unsatisfactory performance during the tests or the assignments will lead to a final mark 'failed' (1). Signature cannot be obtained.

3.5 Grading system

Grade	Score (P)
excellent (5)	$0 \leq P$
good (4)	$0 \leq P < 0\%$
satisfactory (3)	$0 \leq P < 0\%$
pass (2)	$0 \leq P < 0\%$
fail (1)	$P < 0\%$

3.6 Retake and repeat

The homework can be submitted with delay till a pre-defined late submission date – usually one week after the regular deadline – by paying a fee. The two midterm tests can be made up or repeated once during the semester. In case of a repeat, the new score will overwrite the previous score. After paying the fee specified in the regulations, the student may make a second attempt to correct the failed midterm test.

3.7 Estimated workload

Activity	Hours/Semester
Participating at lessons	$14 \times 3 = 42$
Completing homeworks	$2 \times 20 = 40$
Preparing for midterm tests	$2 \times 19 = 38$

3.8 Effective date

1 September 2025

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