BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Artificial intelligence**				
2. … in Hungarian	Mesterséges intelligencia			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**4 | k**
6. Credits	**3**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**1 lecture**	**0 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**90 hours**
Contact hours	28 hours	**Preparation for seminars**	20 hours	**Homework**	0 hours
Reading written materials	20 hours	**Midterm test preparation**	22 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Control for Transport and Vehicle Systems		
14. Subject coordinator	Dr. Bécsi Tamás	**15. Email address**	becsi.tamas@kjk.bme.hu
16. …department	Department of Control for Transport and Vehicle Systems		
17. Lecturers	Dr. Bécsi Tamás		
18. Indicative prerequisites	- - -, - - -, - - -		

19. Aim of the subject

The aim of the course is to familiarize students with the basic principles, technological background and application possibilities of artificial intelligence. Special attention is paid to the ethical dimension of the use of AI, including issues of data protection, responsibility and social impacts. Students analyze and interpret the practical role, benefits and dilemmas of AI through real or realistic case studies.

20. Thematics of lectures

The lecture provides an introduction to the history, concepts, basic operating mechanisms of AI, and the basic principles of machine learning. The course material covers various structures of artificial intelligence: rule-based systems, decision trees, classical machine learning models, and then provides a deeper insight into modern deep learning architectures. Students will become familiar with, among others, convolutional neural networks; generative adversarial networks, etc. The comparison of different learning methods – supervised, unsupervised, and reinforcement – is also emphasized. A prominent topic is the presentation of the operation, teaching, and practical application of large language models (LLMs). Students will learn how these models work, what they are capable of, what risks they may pose, and how they can be used consciously in different fields.

The course also addresses the ethical and social aspects of AI: transparency, accountability, data protection, algorithmic biases, and the sustainable and equitable use of artificial intelligence. At the end of the course, students will analyze AI solutions from industry, education, healthcare, and the public sector through real or simulated case studies.

21. Thematics of practices

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22. Thematics of laboratories

The aim of the lab activities associated with the course is to give students hands-on experience in developing artificial intelligence-based models. The tasks are carried out in an AI-assisted way, where AI is used as a tool to support model building, coding and debugging. During the exercises, students will be introduced to different learning methods and AI application domains, fostering the development of reflective, problem-solving thinking.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Knows the basic concepts of machine learning, the functioning of the "Internet of Things" (IoT), and the role of computer communication and application software in AI systems. (K:T17;J:T17,T21;L:T21)

2. Is aware of the basic principles of the operation of artificial intelligence and its ethical and data protection aspects. (K:T16;L:T20)

b) skills (k)

1. Is able to process structured data, use and design artificial intelligence applications, and effectively search, evaluate and manage digital content. (K:K4,K28,K29,K30,K31;J:K4,K36,K37,K38;L:K4,K31,K32,K33)

2. Is able to communicate, collaborate and interact effectively using digital technologies. (K:K12,K31;J:K12,K39;L:K12,K34)

3. Able to design, operate and test IT systems based on models. (K:K11,K34;J:K11,K42;L:K11,K37)

c) attitude (a)

1. Accepts the professional and ethical responsibility associated with the use of artificial intelligence and actively represents the values of digital rights and democracy. (J,K,L:A1,A2)

2. Continuously develops his/her AI-related knowledge with a reflective, self-critical attitude, is open to changes and technological self-education. (J,K,L:A3,A12)

3. Has a positive attitude towards complex problems related to artificial intelligence, strives for effective, responsible solutions and considers possible alternatives. (J,K,L:A4,A6,A10,A13)

d) autonomy and responsibility (o)

1. Able to take initiative and make decisions independently, from internal motivation, in the design, evaluation or application of artificial intelligence. (J,K,L:O1,O2,O4)

2. Has a critical and responsible attitude towards information related to AI, formulates his/her judgments in a well-founded and autonomous manner. (J,K,L:O5,O6)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 1 2. midterm test 2	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,t2,k2,a3,o1,o2 2. t1,t2,k1,k3,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

To obtain the semester grade, the combined average of Midterm 1 and Midterm 2 must reach at least 50%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Only one of the mid-semester requirements can be made up through repeated replacement.

27. Final grade in percentage of performance

Excellent 88-100%
Good 75-87%
Satisfactory 63-74%
Pass 50-62%
Fail 0-49%

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Basic theories of engineering**				
2. … in Hungarian	Mérnöki alapismeretek			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**1 | k**
6. Credits	**7**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**2 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	30 hours	**Homework**	0 hours
Reading written materials	46 hours	**Midterm test preparation**	50 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Aeronautics and Naval Architecture		
14. Subject coordinator	Dr. Veress Árpád	**15. Email address**	veress.arpad@kjk.bme.hu
16. …department	Department of Aeronautics and Naval Architecture		
17. Lecturers	Dr. Szabó Géza, Dr. Béda Péter, Forberger Árpád, Dr. Veress Árpád		
18. Indicative prerequisites	- - -, - - -, - - -		

19. Aim of the subject

The aim of the subject is to bring the physical knowledge previously acquired at different educational places to the same level. Learning the engineering way of thinking, problem- and task-solving skills. Carrying out and evaluating simpler measurements. Electronics. Introduction to Vector Algebra. Curve fitting to measurement data. Interactive tasks using MATLAB. Writing dynamics and Newtonian equations. Hydrostatics, Pascal and Archimedes' law. Basic thermodynamic concepts, investigation of cycles, states of ideal gas. Examination of drives, their role in vehicle engineering practice.

20. Thematics of lectures

Basics of Statics and Strength of Materials. Basics of Kinematics — Kinetics. Basics of Mechanical Machines. Basics of Fluid Flow Processes in Vehicles. Basics of Thermal Processes in Vehicles. Basics of Electronics. Basics of Measurement Technology / Metrology.

21. Thematics of practices

Exercises are completed after each corresponding chapter by means of solving calculation tasks.

22. Thematics of laboratories

Writing balance equations, interactive tasks related to rigid bodies and material points, application of lossy Bernoulli equation with interactive tasks using MATLAB.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basic physical rules of thermal and fluid dynamics, statiscs, streght of structures, vehicle dynamics, electronics (J,K,L:T2,T3,T6,T7)

b) skills (k)

1. is able to reproduce, adapt and interpret the knowledge about thermal and fluid dynamics, statiscs, streght of structures, vehicle dynamics, electronics in a meaningful way (J,K,L,:K10,K13,K14,K17;J:K36,K45;K:K28,K37;L:K31,K40)

2. is able to communicate the ideas and plans about basic theories of engineering clearly and visually to others (J,K,L,:K10,K13,K14,K17;J:K36,K45;K:K28,K37;L:K31,K40)

c) attitude (a)

1. strives for completeness in the acquisition of knowledge, cooperates with the instructor and fellow students, is empathetic and tolerant towards members of the team (J,K,L:A1-A4,A6,A7,A10-A13)

2. is receptive and proactive in the performance of the tasks assigned to itself, self-critical towards the assigned tasks (J,K,L:A1-A4,A6,A7,A10-A13)

d) autonomy and responsibility (o)

1. comply with and enforce environmental and social standards in their chosen field of work, and are able to self-monitor and correct errors independently, while listening to the professional opinions of others (J,K,L:O2-O6)

2. makes responsible decisions in solving tasks in the chosen field of activity, formulating independent proposals to solve the challenges identified (J,K,L:O2-O6)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,k1,k2,a1,a2,o1,o2 2. t1,k1,k2,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

successful (min. 50%) completion of the midterm tests

27. Final grade in percentage of performance

Excellent 80-100%
Good 70-79%
Satisfactory 60-69%
Pass 50-59%
Fail 0-49%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Second retake or delayed completion is only from one midterm requirement.

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Basics of engineering mechanics**				
2. … in Hungarian	Műszaki mechanika alapjai			**3. Programme code**	kl
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**5**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**150 hours**
Contact hours	56 hours	**Preparation for seminars**	14 hours	**Homework**	0 hours
Reading written materials	10 hours	**Midterm test preparation**	40 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Railway Vehicles and Vehicle System Analysis		
14. Subject coordinator	Dr. Béda Péter	**15. Email address**	beda.peter@kjk.bme.hu
16. …department	Department of Railway Vehicles and Vehicle System Analysis		
17. Lecturers	Dr. Béda Péter, Dr. Forberger Árpád, Horváth Ádám, Görögh Tamás		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

The aim of the course is to explain basic mechanical knowledge used in the current field.

20. Thematics of lectures

Basic Concepts and Principles
- Rigid body, force, system of forces
- Degrees of freedom, constraints, possible displacements
- The d'Alembert–Lagrange principle – an analytical approach to equilibrium and motion

Statics
- Systems of forces – reduction, classification, conditions for equilibrium
- Constraints and fundamental equations of statics
- Static analysis of simple structures
- Statistically determinate and indeterminate beams
- Friction – Coulomb's law
- Internal forces and load effects

Strength of Materials
- Concepts and states of stress and strain
- Design of axially loaded members (tension/compression)
- Bending of beams, buckling (stability of members)
- Torsion – analysis of circular cross-section shafts
- Design considerations and criteria

Kinematics and Dynamics
- Kinematics: classification of motions, trajectories, velocities
- Fundamental equation of dynamics – Newton's second law and its generalization
- Planar motion of rigid bodies – combination of translation and rotation

Elements of Vibration Theory

21. Thematics of practices

Solving practical problems related to the theory presented in the lecture.

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

He/She knows the basic mechanical principles, relationships and procedures necessary for practicing the field. (K,L:T2,T3,T4,T7;K:T10)

b) skills (k)

He/She is able to apply the basic mechanical relationships necessary for the field of expertise in his/her engineering projects. (K,L:K10,K13,K17,K18;K:K28,K37;L:K31,K40)

c) attitude (a)

1. strives for completeness in the acquisition of knowledge, cooperates with the instructor and fellow students, is empathetic and tolerant towards members of his/her team

2. is receptive and proactive in the performance of the tasks assigned to him/her, self-critical of the tasks assigned to him/her (K,L:A4)

d) autonomy and responsibility (o)

1. Comply with standards in their chosen field of work, and are able to self-monitor and correct errors independently, while listening to the professional opinions of others (K,L:O3,O4)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH	1. 50%	1. t1,k1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. written exam	1. V	1. 50%	1. t1,k1,a1,a2,o1

26. Conditions for obtaining signature / midterm grade

successful completion of the midterm test (min. 50%)

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

The midterm test can be replaced with the replacement places written in the delayed completion week.

27. Final grade in percentage of performance

0-49	(1)	fail
50-59	(2)	pass
60-69	(3)	satisfactory
70-84	(4)	good
85-	(5)	excellent

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Basics of freight forwarding**				
2. … in Hungarian	Szállítmányozás alapjai			**3. Programme code**	I
4. Subject code				**5. Term | role**	**4 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**1 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	9 hours	**Homework**	20 hours
Reading written materials	25 hours	**Midterm test preparation**	24 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Transport Technology and Economics		
14. Subject coordinator	Dr. Mészáros Ferenc	**15. Email address**	meszaros.ferenc@kjk.bme.hu
16. …department	Department of Transport Technology and Economics		
17. Lecturers	Dr. Duleba Szabolcs, Dr. Mészáros Ferenc		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

The aim of the course is to provide an introduction to the basic current requirements and regulatory framework for the transport modes of national and international freight transport and freight forwarding as part of supply chains, international customs regulations, the structure and tariff structure of the resulting supply chains, the conditions and effects of the choice of modes.

20. Thematics of lectures

Basic freight forwarding methods and their regulatory framework: freight forwarding concepts, key contract types, customs procedures, pricing methods, parities, freight insurance; the special conditions of carriage, specifications and techniques specific to each mode of carriage.

21. Thematics of practices

Investigation of calculations and case studies, preparation of teamwork case study.

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. understand the basic legal framework of freight transport (T2)
2. know the main organisational rules for sub-sector-specific and intermodal transport and transport chains (T8,T13)
3. understands the principles of tariff calculation, parities, basic customs concepts and insurance used (T15)
4. use digital techniques to select the most appropriate modes of transport (T14)

b) skills (k)

1. be able to navigate in the transport law and insurance framework (K6)
2. compares and analyses the advantages and disadvantages of different types of transport chains (K16,K19)
3. develop and apply the elements of a freight calculation, calculate the freight charge to be paid by the consignor or consignee and the customs duty to be paid on the basis of parities (K20,K24)
4. use digital tools and technologies to perform tasks (S1)

c) attitude (a)

1. strives for completeness in the acquisition of knowledge, cooperates with the teacher and fellow students, is empathetic and tolerant towards members of his/her team (A5,A6,A16,A17)
2. is open, receptive and proactive in carrying out the tasks entrusted to him/her, whether already known or yet to be discovered, and self-critical of the tasks entrusted to him/her (A4,A10,A14,A15)

d) autonomy and responsibility (o)

1. comply with and enforce environmental and social standards in their chosen field of work, and are able to self-monitor and correct errors independently, while listening to the professional opinions of others (O4,O5,O6,O15,O17)

2. makes responsible decisions in solving managerial tasks in his/her chosen field of activity, formulating independent proposals to solve the challenges identified (O2,O3,O12)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. team assignment 3. team assignment reflection	1. ZH 2. F 3. R	1. 60% 2. 25% 3. 15%	1. t1,t2,t3,k1,k3 2. t4,k2,k3,k4,a1,a2,o1,o2 3. a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

min. 50% completion of the midterm test, and submission and presentation of the team assignment of acceptable quality, and reflective evaluation of the other team's assignment

27. Final grade in percentage of performance

Excellent 88-100%
Good 75-87%
Satisfactory 63-74%
Pass 50-62%
Fail 0-49%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Second retake or delayed completion is only from one midterm requirement.

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Basics of lean thinking**				
2. … in Hungarian	Lean szemlélet alapjai			**3. Programme code**	I
4. Subject code				**5. Term | role**	**4 | k**
6. Credits	**6**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	70 hours	**Preparation for seminars**	10 hours	**Homework**	50 hours
Reading written materials	10 hours	**Midterm test preparation**	20 hours	**Exam preparation**	20 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Sztrapkovics Balázs	**15. Email address**	balazs.sztrapkovics@logisztika.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Sztrapkovics Balázs Bakos András		

18. Indicative prerequisites	Value creation systems (strong), Material technology, industrial manufacturing systems (suggested), - - -

19. Aim of the subject

To familiarise students with the lean management philosophy, techniques and methodologies, and to learn their practical application at skill level.

20. Thematics of lectures

Introducing the continuous improvement methods. Teamwork, the establishment of a suggestion system, the importance, and techniques of motivating the employee. Creativity techniques, advantages and disadvantages of each technique. Problem-finding tools, failure analysis methods application in practice, defining the required datas for each method. The bases of standardization, the steps to implement standards in the company, PDCA and SDCA cycles. The zero failure concept. The elimination of the failures (Jidoka, Poka-Yoke). Production leveling methods in lean management, mathematical formulas to apply Heijunka in the production. Process improvement techniques, and methods, the schedule of the Kaizen events. The importance of the lead time, Value Stream mapping, element symbols and steps. The bases of ergonomy. Methodologies for production material supply (Milkrun, Kanban Waterspider Kit car). Just in time and Just in Sequence methodologies are presented. Storage and material handling technologies in manufacturing. Introduction to changeover time and related concepts, reducing changeover time.

21. Thematics of practices

Application of the methods and techniques which was presented in the lecture. Introducing case studies, and also apply the methods during workshops. Doing calculation exercises according to lean management.

22. Thematics of laboratories

Presentation of the practical tools needed to solve the homework, consultations on the homework

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows and applies lean management tools and techniques based on the principles of lean philosophy (T2, T18)

b) skills (k)

1. Ability to identify customer needs, analyse processes using lean tools and, based on these analyses, eliminate losses using lean tools (K1, K9, K16, K17, K18, K20, K21, K23, K26, K27, K40)

c) attitude (a)

1. assess and analyse current processes in a systematic way using lean methodologies (A3, A4,A5, A6)

d) autonomy and responsibility (o)

1. Önállóan képes folyamatok felmérésére veszteségek azonosítására (O2, O3, O4, O5, O6)
2. Önállóan képes rendszerszintű fejlesztési javalsatok kidolgozására értékelésére (O12, O15, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. termly homework assignment 1. sub-assessment 2. termly homework assignment 2. sub-assessment 3. midterm test 4. obligatory consultations	1. HF1 2. HF2 3. ZH 4. KK	1. 20% 2. 20% 3. 10% 4. 0%	1. t1,k1,a1,a2,o1,o2 2. t1,k1,a1,a2,o1,o2 3. t1,k1,a1,a2,o1,o2 4. t1,k1,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written prerequisite test 2. Written exam 3. Oral exam (optional)	1. B 2. V1 3. V2	1. 10% 2. 40% 3. 50%	1. t1,k1,a1,a2,o1,o2 2. t1,k1,a1,a2,o1,o2 3. t1,k1,a1,a2,o1,o2

26. Conditions for obtaining signature / midterm grade

Achieve a separate 50% for each of the two performance assessments of the semester homework and a minimum of 50% of the points in the midterm test

27. Final grade in percentage of performance

0%-49% fail
50%-56% pass
57%-64% satisfactory
65%-74% good
75%-100% excellent

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test and the semester task can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

Two obligatory consultations at a scheduled time and in a time and format agreed with the instructor.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Become a logistics engineer**				
2. … in Hungarian	Logisztikai mérnök leszek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**1 | k**
6. Credits	**3**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**2 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**90 hours**
Contact hours	28 hours	**Preparation for seminars**	15 hours	**Homework**	30 hours
Reading written materials	17 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Kovács Gábor	**15. Email address**	kovacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Kovács Gábor, Dr. Bóna Krisztián, Dr. Bohács Gábor, Lénárt Balázs		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

Introducing students to the main areas of the logistics engineering profession, providing a broad insight into the professional subjects of the education.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Within the framework of the labs, students gain insight into intra- and extralogistics systems, the basics of supply chains and logistics information systems; in an absolutely example-oriented manner. These illustrative examples take place either in university labs or during company visits.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

-

b) skills (k)

1. able to recognize the needs of logistics engineers (K1)
2. able to collect the needs in a logical system using appropriate communication tools (K2, K5, K9)

c) attitude (a)

1. interested in his profession, committed, motivated to develop and learn, adheres to general social norms (A1, A2, A3, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A18)

d) autonomy and responsibility (o)

1. able to work independently and in a team, confident and aware of responsibility (O1, O4, O7, O8, O9, O10, O11, O13, O14)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. semester task	1. F	1. 100%	1. k1,k2,a1,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
At least 50% completion of the semester task.	Excellent 87,5-100% Good 75-87,5% Satisfactory 62,5-75% Pass 50-62,5% Fail 0-49%
28. Attendance and participation requirements	
According to the rules of CoS.	
29. Late completion opportunities	
The semester task can be retaken once during the semester or the delayed completion period.	
30. Consultation opportunities	
At a time and in a form agreed with the teacher.	
31. Validity of the subject datasheet starts from:	
01 September, 2025	

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Control engineering**				
2. … in Hungarian	Irányítástechnika			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**4 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**1 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	14 hours	**Homework**	0 hours
Reading written materials	32 hours	**Midterm test preparation**	32 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Control for Transport and Vehicle Systems		
14. Subject coordinator	Dr. Tettamanti Tamás	**15. Email address**	tettamanti.tamas@kjk.bme.hu
16. …department	Department of Control for Transportation and Vehicle Systems		
17. Lecturers	Dr. Tettamanti Tamás, Dr. Varga Balázs, Wágner Tamás, Ormándi Tamás		
18. Indicative prerequisites	Mathematics A1a (weak), Electrotechnics - Electronics (weak), - - -		

19. Aim of the subject

The Control Engineering course covers the fundamentals of classical and modern control engineering for linear, time-invariant systems. This includes the basics of system theory (modeling, identification, time-domain and frequency-domain analysis, stability), frequency-domain control (basic transfer functions, series compensation, PID control, filters), state-space theory based modeling and control (state feedback structure, pole placement, LQ control, discrete-time modeling, Kalman filtering). Students who complete the course will be able to interpret, apply and design industrial control solutions in automotive engineering, transport engineering and logistics.

20. Thematics of lectures

In the Control Engineering lectures, students learn the basics of classical and modern control engineering for linear, time-invariant systems through practical examples (from automotive, transport, and logistics fields). The lectures will be presented in Matlab Live Script format in order to demonstrate the applicable methods directly in algorithmic form and to allow the students to easily try them in an interactive way. Lecture topics: basic concepts of control engineering, control design process, time domain analysis of system properties, BIBO stability, Laplace transformation, mathematical modeling of systems, transfer function, system identification, description of systems with basic transfer functions, control block diagram, frequency domain, Bode diagram, closed loop systems analysis, series compensation structure, PID control, tuning of PID control, filters, physical realization of controls/filters, state space theory, state space canonical forms, relationship between transfer function and state space, state space properties (stability, controllability), feedback control structure, pole placement, LQ control, state space identification, discrete-time state space, discrete-time LQ control, Kalman filtering.

21. Thematics of practices

In the practical part of the Control Engineering course, students will learn the basics of classical and modern control engineering for linear, time-invariant systems by solving practical examples. Topics of the exercises: system modeling (electronic and mechanical systems), time domain analysis, stability analysis, Laplace transformation, transfer function calculation, frequency domain analysis, application of Bode diagrams, series compensation problems, state space theory based modeling and analysis (stability, controllability), application of feedback control structure (pole placement, LQ control), discrete time state space, discrete time LQ control.

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Knowledge of the basic modeling, analysis and regulation paradigms of the control engineering for linear, time-invariant systems in the field of vehicle engineering, transport and logistics. (J:T9,T15)

b) skills (k)

2. The student understands the modeling approach and the regulation method used for a given control problem for linear, time-invariant systems in the field of vehicle engineering, transport and logistics.
(J:K10,K11,K12,K17,K36,K40,K42,K43,K44;K:K10,K11,K12,K17,K28,K32,K34,K35,K36;L:K10,K11,K12,K17,K31,K35,K37,K38,K39)

c) attitude (a)

3.The student is interested in the implementation of system modeling and control in the field of vehicle engineering, transport and logistics. (J,K,L:A2)

d) autonomy and responsibility (o)

4. The student is able to independently resolve a given control problem in the field of vehicle engineering, transport and logistics. (J,K,L:O1,O3)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. written midterm test 1. 2. written midterm test 2. 4. four electronic practice assignments	1. ZH1 2. ZH2 3. EF	1. 40% 2. 40% 3. 20%	1. t1,k1,a1,o1 2. t1,k1,a1,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

Successful completion of the midterm tests (min. 50% each), successful completion of the 4 electronic practice assignments (min. 85% each).

27. Final grade in percentage of performance

Excellent 92-100%
Good 79-91%
Satisfactory 67-78%
Pass 50-66%
Fail 0-49%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Second retake or delayed completion is allowed for both midterm tests.

30. Consultation opportunities

There will be a practical lesson and a consultation before the midterm exam. Moreover, consultation is possible at a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Database management systems**				
2. … in Hungarian	Adatbázis rendszerek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	56 hours	**Preparation for seminars**	30 hours	**Homework**	0 hours
Reading written materials	10 hours	**Midterm test preparation**	24 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Lénárt Balázs	**15. Email address**	balazs.lenart@logisztika.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Lénárt Balázs, Bertalan Marcell		
18. Indicative prerequisites	Programming (suggested), - - -, - - -		

19. Aim of the subject

Mastering the data and information management tasks and tools of decision-making methodologies that arise during logistics engineering activities.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Databases of integrated logistics information systems, databases for operational management of the logistics process. The concept of a database, data modeling, basics of relational database management. Mastering the standard language of database management (SQL): creating data tables, editing and running queries. Performing data preparation tasks in a business intelligence application.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the data preparation tasks required for logistics analyses, can collect data and group them appropriately (T2)
2. knows the basic concepts of database management (T2)
3. knows the standard language of database management (T2)

b) skills (k)

1. is able to review complex logistics data structures and create queries on them (K4, K31, K32, S1)
2. is able to execute data insert, data update and deletion commands (K4, K31, K32, S1)
3. is able to build and prepare data tables for subsequent statistical analyses (K4, K29, K39, S1)

c) attitude (a)

1. strives for data-based decision-making in his professional work (A3, A4, A16)
2. is interested in new things, has a cooperative attitude towards the organization of logistics processes (A3, A4, A14, A15)

d) autonomy and responsibility (o)

1. is aware of the significance of his/her work and the consequences of mistakes (O3, O4)
2. formulates independent suggestions for solving tasks (O3, O4)
3. is able to self-monitor and independently correct mistakes by learning about the professional opinions of others (O3, O4)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes

1. first midterm test 2. second midterm test	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2,o3 2. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2,o3

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

A minimum of 50% completion of the two midterm tests is required for the final grade.

27. Final grade in percentage of performance

Excellent 80-100%
Good 70-80%
Satisfactory 60-70%
Pass 50-60%
Fail 0-50%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The two midterm tests can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Electrotechnics - Electronics**				
2. … in Hungarian	Elektrotechnika - Elektronika			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**6**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**3 lecture**	**1 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	70 hours	**Preparation for seminars**	14 hours	**Homework**	16 hours
Reading written materials	26 hours	**Midterm test preparation**	24 hours	**Exam preparation**	30 hours
13. Organisational unit in charge	Department of Control for Transport and Vehicle Systems				
14. Subject coordinator	Dr. Szabó Géza	**15. Email address**	szabo.geza@kjk.bme.hu		
16. …department	Department of Control for Transport and Vehicle Systems				
17. Lecturers	Dr. Szabó Géza				
18. Indicative prerequisites	- - -, - - -, - - -				

19. Aim of the subject

The aim of the course is to introduce the most important engineering topics in electronics and electrical engineering and to provide a basic level of proficiency.

20. Thematics of lectures

It provides basic engineering knowledge of principles of electrotechnics, of its measurements, of its basic models. Introduces students to the operating principles of the basic elements of electronics, to their parameters, features, characteristics as well as their selection/engineering options. It also introduces the students to the schematics, modelling and analysis principles of amplifying and switching circuitry, and shows the special transportation and vehicle applications. It presents the principles and main parameters of electrical machines as well as their application in vehicle and transportation.

21. Thematics of practices

Application of the principles presented on lectures, solving exercises. The aim is to teach independent application of circuit principles and independent problem solving.

22. Thematics of laboratories

Laboratory measurements from selected topics.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. understands the basic principles and basic relationships of electrotechnics, the operation, symbols, features and characteristics of basic electronic components, the amplifying and switching circuits, and the working principles of electrical machines. (J,K,L:T2,T4,T6,T7)

b) skills (k)

1. is able to understand and analyze the operation of simple electronic circuits. (J,K,L:K10,K17;J:K36,K42;K:K28,K34;L:K31,K37)

c) attitude (a)

1. participates in solving basic electric problems in the field of transport or vehicle, to work efficiently and willingly with specialists of other fields (in particular: electrical engineering). (A2)

d) autonomy and responsibility (o)

1. is aware of and treats the responsibility associated with the task solution during electric and electronic system problem solving and analysis. (O1,O3)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH1	1. 6%	1. t1,k1,a1,o1
2. midterm test	2. ZH2	2. 6%	2. t1,k1,a1,o1

3. homework 4. homework 5. laboratory measurement and report 6. laboratory measurement and report 7. laboratory measurement and report	3. HF1 4. HF2 5. LJ1 6. LJ2 7. LJ3	3. 7,5% 4. 7,5% 5. 2% 6. 2% 7. 2%	3. t1,k1,a1,o1 4. t1,k1,a1,o1 5. t1,k1,a1,o1 6. t1,k1,a1,o1 7. t1,k1,a1,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. oral exam	1. V	1. 67%	1. t1,k1,a1,o1

26. Conditions for obtaining signature / midterm grade

During the semester: two midterm tests, two homework and three laboratory measurements with their report about the results.

27. Final grade in percentage of performance

0%-49%: fail; 50%-60%: pass; 61%-70%: satisfactory; 71-80%: good; 81%-100%: excellent

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm tests have individual re-tests and second (paid) re-tests; the second (paid) re-test can be taken only if a test or a re-test has been taken. Homeworks can be corrected or submitted during the delayed completion week (paid). The laboratory practices can be re-taken during the delayed completion week; protocols about labs can be submitted or corrected during the delayed completion week (paid).

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Fluid dynamics, thermodynamics and heat transfer 1.**				
2. … in Hungarian	Hő- és áramlástan 1.			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**4**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**1 lecture**	**2 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	56 hours	**Preparation for seminars**	10 hours	**Homework**	0 hours
Reading written materials	0 hours	**Midterm test preparation**	22 hours	**Exam preparation**	32 hours

13. Organisational unit in charge	Department of Aeronautics and Naval Architecture		
14. Subject coordinator	Dr. Veress Árpád	**15. Email address**	veress.arpad@kjk.bme.hu
16. …department	Department of Aeronautics and Naval Architecture		
17. Lecturers	Dr. Hargitai Csaba, Jankovics István, Dr. Veress Árpád		
18. Indicative prerequisites	Basic theories of engineering (suggested), Mathematics A2a (suggested), - - -		

19. Aim of the subject

Understanding the basic thermodynamic, heat transfer and flow processes, learning their theoretical and practical aspects

20. Thematics of lectures

Introduction: Systems, Fluid dynamics, thermodynamics and heat transfer and their applications in logistics, transportation and vehicle engineering, Continuum mechanics, Kinetic theory of gases, introduction of basic parameters (ρ, v, p, T), equations of state. Fluid dynamics: Liquids, steams, and gases in p-v-T state space (compressible and incompressible mediums), Description of fluid motions according to Euler and Lagrange, The principle of mass, momentum and energy conservation laws, Hydrostatics, Newtonian fluid, The basic laws of viscous flow, Boundary layer, Boundary layer separation, Internal, external and cascade flows, Fluid dynamics in and around of logistics', transportation's and vehicle's systems – forces and coefficients, Similarity theory of fluids, Compressible fluids: sound speed in liquids and gases, Pressure waves, Doppler's effect, Sound barrier, Mach cone, Allievi's water hammer effect. Thermodynamics: Heat and specific heat, The 1st law of thermodynamics, Thermodynamic processes, The 2nd law of thermodynamics, Cycles, useful work, thermal efficiency and coefficient of performance, Air with moisture and corresponding processes, Introduction to heat transfer – classification, principles, characteristics, applications and their conditions.

21. Thematics of practices

Exercises are completed after each corresponding chapter by means of solving calculation tasks.

22. Thematics of laboratories

Temperature measurement of gases. Measurement of thermodynamic processes. Determination the ratio of specific heats by experiments. Investigation of thermodynamic processes in moist air. Reynolds experiment. Volume flow measurement. Determination of contraction factor. Jet engine model.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the theoretical together with measurement- and analytical calculation-based practical aspects of the studied chapters in fluid dynamics, technical thermodynamics and heat transfer in continuum flow regime with especial care for the logistics, transportation and vehicle engineering, meanwhile she/he knows the advantages, disadvantages, conditions and application ranges of the different processes and methods; (J,K,L:T4,T7;J:T9)

2. knows the relevant professional literature, she/he knows the way of finding, questing the needed detailed technical information about the investigated problem and the student knows and the student is able to use diagrams and tables in the field of fluid dynamics, thermodynamics and heat transfer. (J,K,L:T4,T7;J:T9)

b) skills (k)

1. can complete theoretical and practical (measurements, experiments, tests and calculations) tasks in the field of fluid dynamics, technical thermodynamics and heat transfer in line with the content of the subject in the field of maintenance and developments with verification, plausibility check and validation (in case of relevancies) (J,K,L:K10,K11,K17;J:K22,K26,K27,K29,K32,K33,K36;K:K28;L:K31)

2. can recognise the desired modifications (e.g.: improvements and developments) in the fields of the subject, the student can perform the needed actions for changes and can check, analyse and understand the results of the modifications. (J,K,L:K10,K11,K17;J:K22,K26,K27,K29,K32,K33,K36;K:K28;L:K31)

3. can understand complex systems and processes, can plan, monitor, evaluate and making decision together with considering all external and internal effects acting on the investigated activity and the effects of her/his activity on other systems. (J,K,L:K10,K11,K17;J:K22,K26,K27,K29,K32,K33,K36;K:K28;L:K31)

c) attitude (a)

1. aims to complete the studies at the highest level, under the shortest time, by providing the knowledge and capacity at the best to obtain knowledge for deep and independent professional work; (J,K,L:A2)

2. cooperates with professors and mates during the studies; (J,K,L:A2)

3. continuously increases the knowledge independently by having information from the external literature given by the lectures to complete the studies; (J,K,L:A2)

d) autonomy and responsibility (o)

1. completes the homework, reports about laboratory practices and makes exercises about calculation tasks independently; (J,K,L:O3)

2. takes responsibility for guiding mates by the quality of the work and by keeping ethic norms; (J,K,L:O3)

3. takes responsibility for applying the knowledge in line with the studied conditions, limitations and constraints; (J,K,L:O3)

4. can friendly accept the well-established constructive criticism and can utilize that in future; (J,K,L:O3)

5. can accept the form of the cooperation; she/he can work alone or in a team member depends on the actual situation; (J,K,L:O3)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH	1. 0%	1. t1,t2,k1-k3,a1-a3,o1-o5

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam	1. V	1. 100%	1. t1,t2,k1-k3,a1-a3,o1-o5

26. Conditions for obtaining signature / midterm grade

Requirement for signature of the subject: successful completion of the midterm exam and the laboratory practices.

28. Attendance and participation requirements

According to the rules of Study and Examination Regulations.

29. Late completion opportunities

Second retake from the midterm test.

27. Final grade in percentage of performance

Excellent 80-100%
Good 70-79%
Satisfactory 60-69%
Pass 50-59%
Fail 0-49%

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Freight transporting systems**				
2. … in Hungarian	Áruszállítási rendszerek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**5 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**3 lecture**	**2 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	16 hours	**Homework**	40 hours
Reading written materials	20 hours	**Midterm test preparation**	20 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Kovács Gábor	**15. Email address**	kovacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Kovács Gábor, Dr. Bóna Krisztián, Dr. Sztrapkovics Balázs, Bakos András		

18. Indicative prerequisites	Intralogistics (strong), Basics of freight forwarding (strong), - - -

19. Aim of the subject

To familiarize students with the role of freight transport processes in logistics chains, with modern methods of managing and controlling freight transport processes, and with the specific means and facilities of freight transport and loading.

20. Thematics of lectures

Tasks, groups, physical processes of freight transport systems, characteristics of transport chains, subsectors, freight transport needs, modal split. Characterization of the transported goods, units of load, load stress. Loading of transport vehicles, general aspects, bridging devices and structures, fastening equipments. Load securing methods. Groups of vehicles of the rail transportation, wagons, closed wagons, other special vehicles, fasteners, loading instructions. Groups, fixings, loading instructions and regulations of road freight transport vehicles. Water and air freight vehicles and their loading aspects, fasteners, pipeline transportation technology. Combined freight transport systems, container transport, road-water-rail combined freight transport systems. Conventional methods and tools for loading vehicles, manual and machine loading, cycle time. Unusual freights, transport of dangerous goods, regulation of various sub-sectors. Logistics services and service centres. The gateway concepts. Supply and development of city centres. City logistics projects and their effects, city logistics in Hungary. Transport networks, basics of transport control.

21. Thematics of practices

Develop central transshipment processes. Intermodal unit, loading of transport vehicles, loading plan. Traffic data, rail transport connection, road transport connection, container transport connection, other facilities. Material handling tasks, choice of material handling equipments, time needed for material handling, number of material handling machines. Cargo forces, cargo securing modes (rail and road).

22. Thematics of laboratories

Testing cargo securing and loading methods under laboratory conditions. Using basic functions of transport control software.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basics of transport logistics, transport chains, modes of transport, goods transport vehicles (T1, T2, T8)
2. knows the parameters influencing transport and loading technology, their tools and methods (T3, T11, T13, T16)
3. knows the basics of logistics service centers and city logistics (T10, T14)

b) skills (k)

1. able to understand the processes and structure of freight transport networks and to use them appropriately (K6, K15, K19, K20, K22)
2. able to choose between different freight transport modes (K9, K16, K24)
3. able to perform basic cargo, loading bay and transport planning tasks (K13, K14, K17, K18, K21, K40)

c) attitude (a)

1. strives to organize and execute transportation processes precisely during his/her work (A3, A4, A10, A17)

2. interested in new things, has a cooperative attitude towards organizing transportation processes (A5, A6, A14, A15, A16)

d) autonomy and responsibility (o)

1. independently responsible for operating transport networks, performing basic organizational and planning tasks (O2, O4, O5, O12, O15)

2. aware of the significance of his work and the consequences of mistakes (O3, O6, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test (this can be replaced with short tests written during lectures) 2. semester task	1. ZH 2. F	1. 20% 2. 30%	1. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2 2. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam 2. Oral exam	1. I 2. SZ	1. 25% 2. 25%	1. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2 2. t1,t2,t3,k1,k2,k3,a1,a2,o1,o2

26. Conditions for obtaining signature / midterm grade

The midterm test can optionally be replaced by continuous partial performance evaluations, at least 50% performance of each the midterm test and the semester task is the condition of the signature.

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test and the semester task can be retaken once during the semester or the delayed completion period.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Future technolgies in logistics**				
2. … in Hungarian	Jövőtechnológiák a logisztikában			**3. Programme code**	I
4. Subject code				**5. Term | role**	**5 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	17 hours	**Homework**	30 hours
Reading written materials	25 hours	**Midterm test preparation**	24 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Rózsa Zoltán	**15. Email address**	rozsa.zoltan@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Rózsa Zoltán, Dr. Bohács Gábor, Dr. Bóna Krisztián		

18. Indicative prerequisites	Intralogistics (strong), Supply chain control (strong), Basics of lean thinking (suggested)

19. Aim of the subject

Students should become familiar with current trends in logistics, future directions, and related technologies.

20. Thematics of lectures

The subject lectures focus on understanding and mastering the revolutionary changes taking place in the field of logistics, with particular emphasis on the triad of digitalization, automation and artificial intelligence. Of these key areas, automation is particularly in focus, providing a comprehensive overview of the latest technological developments and their practical application in logistics processes. Accordingly, we discuss in detail the various forms of robotics in warehousing and transportation, automated material handling systems, the logistics potential of autonomous vehicles, and the application possibilities of drone technology from package delivery to inventory. We also present the role of machine vision in quality control and the optimization of warehouse processes. Furthermore, the logistical role of technologies such as generative AI, wearable sensors, virtual reality, and remote control is also discussed. The importance of cybersecurity in protecting digitalized logistics systems is also emphasized. The subject also touches on advanced analytical methods to support decision-making. The role of 3D printing in on-demand manufacturing and spare parts logistics, the concept and application of smartification in logistics infrastructure, the use of digital twins in process simulation and optimization, the role of digital marketplaces in logistics services, and the importance of edge computing in real-time data analysis and rapid responsiveness. In addition to the above, the topics are constantly updated in accordance with current industry trends and the latest research results, ensuring that students have up-to-date knowledge in the dynamically developing field of logistics.

21. Thematics of practices

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22. Thematics of laboratories

The aim of the lab is for students to deepen the theoretical knowledge acquired in the lectures through practical tasks, with a special focus on automation technologies. The primary focus of the exercises is the automation of logistics processes, which includes learning about the practical application of robotics, automated material handling systems, autonomous vehicles and drone technology. The students solve automation and programming tasks. In addition, they become familiar with the operation and control principles of automated material handling systems, analyzing various industry implementations through case studies. During the lab, image processing plays an important role in logistics, and the students learn basic image processing algorithms. A significant part of the exercises is the detailed discussion of real industry use cases, where students can analyze the advantages and disadvantages of various automation solutions, as well as the challenges associated with their implementation, with the involvement of experts. The topics are complemented by factory visits and technology demonstrations, where students can see the latest automation technologies in action in a logistics environment, including robotic processes in modern warehouses and the operation of autonomous logistics vehicles. During the lab, students also participate in project work, where they have to design and present an automation solution to a specific logistics problem.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows current logistics trends (T10, T11)
2. knows the basics of logistics automation (T19, T21)
3. knows the main elements and applications of logistics drone technology (T10, T11)

b) skills (k)

1. is able to identify opportunities for automation of logistics processes (K18)
2. is able to analyze logistics problems, assess current trends and apply appropriate technology (K30, K31, K35, K36)
3. is able to take a systems approach and also make component-level selection (K37, K38)

c) attitude (a)

1. cooperates with the instructor and fellow students in solving tasks (A5, A15, A16, A17)
2. is receptive and proactive in completing the tasks assigned to him/her, self-critical in relation to the tasks assigned to him/her (A4, A5, A6, A10, A14)
3. is interested in new things, receptive in acquiring new knowledge (A5, A6, A14, A15, A16)
4. strives to perform the tasks correctly, flawlessly and precisely during his/her work (A4, A10, A16)

d) autonomy and responsibility (o)

1. is aware of the significance of his/her work and the consequences of mistakes made while solving tasks (O3, O4, O5, O6, O15, O17)
2. formulates independent proposals for solving the identified challenges (O2, O3, O4, O5, O6, O12, O15)
3. is able to self-monitor and independently correct mistakes after learning about the professional opinions of others (O2, O3, O4, O6, O17)
4. is aware of the importance of the division of tasks and leadership tasks in the case of team work (O15)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test	1. ZH1	1. 12%	1. t1-t3,k1-k3,a1-a4,o1-o4
2. second midterm test	2. ZH2	2. 12%	2. t1-t3,k1-k3,a1-a4,o1-o4
3. first practical small task	3. KF1	3. 4%	3. t1-t3,k1-k3,a1-a4,o1-o4
4. second practical small task	4. KF2	4. 4%	4. t1-t3,k1-k3,a1-a4,o1-o4
5. first homework	5. HF1	5. 4%	5. t1-t3,k1-k3,a1-a4,o1-o4
6. second homework	6. HF2	6. 4%	6. t1-t3,k1-k3,a1-a4,o1-o4

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam	1. V	1. 60%	1. t1-t3,k1-k3,a1-a4,o1-o4

26. Conditions for obtaining signature / midterm grade

At least 50% completion of the midterm tests and homework assignments separately, and at least 50% completion of the small assignments in total, is required for the signature.

27. Final grade in percentage of performance

Excellent 80-100%
Good 70-80%
Satisfactory 60-70%
Pass 50-60%
Fail 0-50%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm tests, the small tasks, and the homeworks can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Gamification**				
2. … in Hungarian	Gamification			**3. Programme code**	I
4. Subject code				**5. Term | role**	**6 | k**
6. Credits	**6**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**5 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	70 hours	**Preparation for seminars**	50 hours	**Homework**	32 hours
Reading written materials	28 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Sárdi Dávid Lajos	**15. Email address**	sardi.david@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Sárdi Dávid Lajos, Bertalan Marcell		

18. Indicative prerequisites	Supply chain control (strong), Statistical analyses in logistics (suggested), - - -

19. Aim of the subject

Application of the logistics and statistical analysis methodologies learned in the previous semesters in a simulation game, learning about the operation of logistics systems within the framework of the simulation game.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Presentation of the simulation game used during the semester. Creating student teams for the semester simulation game. Student team opening presentation, team introductions. Launch of simulation game, independent takeover of simulated companies by student teams. Simulation game during the semester, application of logistics and statistical methodologies learned. Independent application of logistics and statistical methodologies in the first small task. Independent application of logistics and statistical methodologies in the second small task. Independent application of logistics and statistical methods in the third small task. Independent application of logistics and statistical methods in the fourth small task. Mid-semester presentation by the student teams, presenting the progress made in the first half of the semester and the results obtained so far. Independent application of logistics and statistical methods in the fifth small task. Independent application of logistics and statistical methods in the sixth small task. Independent application of logistics and statistical methods in the seventh small task. Final presentation by the students, presentation of the whole semester's work, the results obtained, and the lessons learnt from the simulation game as a team.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows complex enterprise supply systems and their main elements (T8, T9, T10, T17, T18, S1)
2. knows methodologies applicable to the analysis of complex enterprise logistics systems (T8, T9, T10, T17, T18, S1)

b) skills (k)

1. is able to apply basic logistics and statistical analysis methodologies in complex enterprise logistics systems (K2, K5, K7, K8, K12, K28, K31, K32, K34)

c) attitude (a)

1. cooperates with the teacher and fellow students in solving tasks (A5, A7, A15, A16)
2. is receptive and proactive in carrying out the tasks assigned, and is, self-critical in the tasks (A3, A4, A5, A6, A10, A11, A14)
3. is interested in new things, receptive to new knowledge (A5, A6, A14, A15, A16)
4. strives to carry out tasks correctly, accurately and precisely (A3, A4, A10, A12, A16)

d) autonomy and responsibility (o)

1. understands the importance of the work and the consequences of mistakes made in solving the tasks (O3, O4, O5, O6, O9, O15, O17)
2. formulates independent proposals to solve the challenges identified (O1, O2, O3, O4, O5, O6, O12, O13, O14, O15)
3. is able to self-monitor and correct mistakes independently by listening to the professional opinions of others (O2, O3, O4, O6, O8, O9, O11, O14, O17)
4. is aware of the division of tasks and the presence of management responsibilities when working in a team (O8, O9, O11, O13, O14, O15)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. opening presentation	1. P1	1. 10%	1. t1,t2,k1,a1-a4,o1-o4
2. mid-semester presentation	2. P2	2. 10%	2. t1,t2,k1,a1-a4,o1-o4
3. closing presentation	3. P3	3. 10%	3. t1,t2,k1,a1-a4,o1-o4
4. first small task in the simulation game	4. KF1	4. 10%	4. t1,t2,k1,a1-a4,o1-o4
5. second small task in the simulation game	5. KF2	5. 10%	5. t1,t2,k1,a1-a4,o1-o4
6. third small task in the simulation game	6. KF3	6. 10%	6. t1,t2,k1,a1-a4,o1-o4
7. fourth small task in the simulation game	7. KF4	7. 10%	7. t1,t2,k1,a1-a4,o1-o4
8. fifth small task in the simulation game	8. KF5	8. 10%	8. t1,t2,k1,a1-a4,o1-o4
9. sixth small task in the simulation game	9. KF6	9. 10%	9. t1,t2,k1,a1-a4,o1-o4
10. seventh small task in the simulation game	10. KF7	10. 10%	10. t1,t2,k1,a1-a4,o1-o4

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

At least 50% completion of all presentations, attendance at all three presentations and at least 50% completion of the small practical tasks in the simulation game are required for the final grade.

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

According to the rules of CoS. In the case of small tasks, a maximum of four out of seven small tasks chosen by the student teams may be resubmitted, if the total point of the seven small tasks does not reach 50%. In the case of presentations, a maximum of two out of three presentations chosen by the student teams may be retaken, provided that the total point of the three presentations does not reach 50%.

27. Final grade in percentage of performance

Excellent 85-100%
Good 70-85%
Satisfactory 60-70%
Pass 50-60%
Fail 0-50%

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Intralogistics**				
2. … in Hungarian	Intralogisztika			**3. Programme code**	I
4. Subject code				**5. Term | role**	**4 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**2 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	17 hours	**Homework**	30 hours
Reading written materials	25 hours	**Midterm test preparation**	24 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Bohács Gábor	**15. Email address**	bohacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Bohács Gábor, Dr. Bóna Krisztián, Dr. Rinkács Angéla		

18. Indicative prerequisites	Value creation systems (strong), Packaging technology (strong), Material technology, industrial manufacturing systems (suggested)

19. Aim of the subject

To familiarize students with the operation of intralogistics systems, their most common mechanical components, and their basic calculation algorithms. Presentation of the typical topology of continuous and discntinuous operating material handling and storage systems. Basic analyzing methods of material handling processes. In addition to the structural design of warehouse equipment, it also introduces students to operational, automation, and safety issues.

20. Thematics of lectures

Historical overview and system models of intralogistics systems. The function and operation of material handling machines used in intralogistics, and the basic calculations associated with them. Typical construction of forklifts and applicable automation solutions. Stacking and retrieval machines, and automated warehouse systems with satellite carts. Conveyor systems. Performance and reliability of continuous and discontinuous operating material handling systems. Determination of material handling time requirements. Examination of material handling processes. Storage systems and their main components, storage type technologies and topological solutions. Typical design variants of traditional and high-bay warehouse systems. Technical, technological and organizational solutions for order picking. Methods of organizing and managing storage processes. Structural design, operation and automation issues of warehouse equipment. Safety issues of material handling and warehousing.

21. Thematics of practices

Practical application of the methods presented in the lectures. Practicing the calculation basics of material handling machines through examples. Intensity and performance calculation. MTM and AIM methods. Multi-moment method, time measurement. Practicing the tasks of storage systems.

22. Thematics of laboratories

Carrying out measurements of material handling and warehouse equipment in the department laboratory (forklift, crane, conveyor), and comparing the results with calculations performed in practice. Analyzing a complex process using time measurement and the AIM method in group work.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Knows the systematic approaches to the design and operation of intralogistics systems. (T1,T8,T16,T18,T19,S1,S2)
2. Knows the national and international standards and regulations to ensure that the intralogistics system operates as prescribed. (T2,T10)
3. Understands the theoretical and practical elements of science that influence the development of intralogistics machines. (T3,T11)

b) skills (k)

1. Able to assess compliance with legal requirements for individual components of intralogistics (K6)
2. Able to formulate the advantages and disadvantages of alternative solutions (K9,K23,K37)

3. Able to read and interpret technical drawings and documentation of equipment used in intralogistics systems, and to operate the equipment based on the documentation (K13,K14,K18,K22,K25,K26,K27,K35,K36,K40)
4. Able to perform basic tests related to the evaluation of systems (K15,K16,K17,K38)
5. Define intralogistics processes, their characteristics and effects (K19,K20,K21)

c) attitude (a)

1. strives for completeness in acquiring knowledge, takes initiative in completing missing details, (A3,A4)
2. is receptive and proactive in completing the tasks assigned to him, self-critical in relation to the tasks assigned to him (A5, A6)
3. is interested in new things, is receptive in acquiring new knowledge (A10,A14,A15,A16)
4. strives for correct, flawless and precise execution of tasks during his work (A16)
5. Follows up on legislative, technical, technological and administrative changes related to logistics (A17)

d) autonomy and responsibility (o)

1. is aware of the significance of his/her work and the consequences of mistakes made while solving tasks (O3, O4, O5, O6)
2. formulates independent proposals for solving the identified challenges (O2, O3, O4, O5, O6, O12, O15)
3. is able to self-monitor and independently correct mistakes after learning about the professional opinions of others (O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test	1. ZH1	1. 10%	1. t1-t3,k1-k5,a1-a5,o1-o3
2. first small task	2. KF1	2. 5%	2. t1-t3,k1-k5,a1-a5,o1-o3
3. second small task	3. KF2	3. 5%	3. t1-t3,k1-k5,a1-a5,o1-o3
4. third small task	4. KF3	4. 10%	4. t1-t3,k1-k5,a1-a5,o1-o3

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam	1. V	1. 70%	1. t1-t3,k1-k5,a1-a5,o1-o3

26. Conditions for obtaining signature / midterm grade

The average of the evaluation of the small assignments must reach 50%. The midterm test must be at least 50%.

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test can be retaken once during the semester or the delayed completion period. In the case of small tasks, a maximum of one assignment per can be supplemented.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Labour safety**				
2. … in Hungarian	Biztonságtechnika			**3. Programme code**	kl
4. Subject code				**5. Term | role**	**5 | k**
6. Credits	**3**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**1 lecture**	**0 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**90 hours**
Contact hours	28 hours	**Preparation for seminars**	10 hours	**Homework**	8 hours
Reading written materials	24 hours	**Midterm test preparation**	20 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Rinkács Angéla	**15. Email address**	rinkacs.angela@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Rinkács Angéla, Dr. Bohács Gábor		

18. Indicative prerequisites	Electrotechnics - Electronics (strong), Intralogistics (strong), - - -

19. Aim of the subject

The aim of the students' occupational health and safety education is to ensure that professionals involved in the operation of logistics and transport systems are aware of the basic rules and practices of occupational health and safety. The goals of occupational health and safety education are: accident prevention, legal and regulatory knowledge, knowledge of occupational health and safety tools and techniques, ensuring a safe working environment, post-accident procedures, etc.

20. Thematics of lectures

The concept system of labour safety, the forms of manifestation of dangers and harms. The concept and current level of labour safety. Occupational accident processes, causes of occupational accidents, the course of accidents, consequences. Areas and boundaries of labour safety. Working environment protection, labour health. Basic ergonomic concepts. General principles of safety technology. Safety-technical characteristics of protective equipment. Influence of environmental effects on the safe operation of machines. Formulation and professional treatment of ergonomic problems. Man-machine-environment relationship systems. The domestic situation of the application of ergonomics. Electrical safety regulations and regulations. Safe installation, operation and maintenance of high-current electrical equipment. Contact protection. Contact protection classes. Grounded and ungrounded networks, contact protection methods with and without protective conductors. Labour safety issues of material handling machines. Labour safety issues of storage equipment. Taking the human factor into account when designing technical systems. Processes of introducing new information technologies. Issues of ergonomic analysis and design. Lighting of workplaces. Natural and artificial lighting requirements and methods for rooms and workspaces. Workplace noise abatement. Properties of noise sources, noise reduction methods. Flow technology noise sources. Noise pollution reduction with installation and organization methods. Labour safety and environmental aspects of plant installation. Factors influencing human performance and strain in the human-computer system. Ergonomic analysis.

21. Thematics of practices

-

22. Thematics of laboratories

Safety issues of warehouse technology and material handling machines. Racking systems and personal protective equipment. New occupational safety trends.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basics and concepts of safety technology, the language of the applied regulations (K,L:T1,T2)
2. knows the related electrotechnical and natural science aspects, requirements, and design tools of safety technology (K,L:T6,T7)
3. knows the operation and operation of material handling machines related to safety technology (K:T10;L:T11,T16)

b) skills (k)

1. is able to ensure compliance with legal requirements and interpret relevant risk assessment measures (K,L:K6,K17;K:K21,K23,K26;L:K25,S1)

c) attitude (a)

1. strives to precisely organize and implement safety processes in his/her work (K,L:A2,A4,A5,A6)
2. interested in new developments, has a cooperative attitude towards organizing safety processes (K:A14;L:A14,A15,A16,A17)

d) autonomy and responsibility (o)

1. independently responsible for operating safety processes and performing basic organizational and planning tasks (K,L:O2,O4,O5;K:O12)
2. aware of the significance of his/her work and the consequences of errors (K,L:O3,O6;L:O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. semester task 2. midterm test	1. F 2. ZH	1. 60% 2. 40%	1. t1,t2,t3,k1,a1,a2,o1,o2 2. t1,t2,t3,k1,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

Completion of at least 50% of the semester task and at least 50% of the midterm separately, and completion of the laboratory tasks.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test, the semester task and one laboratory work can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Logistics information systems**				
2. … in Hungarian	Logisztikai információs rendszerek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**5 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	36 hours	**Homework**	0 hours
Reading written materials	30 hours	**Midterm test preparation**	30 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Lénárt Balázs	**15. Email address**	balazs.lenart@logisztika.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Lénárt Balázs, Bertalan Marcell		

18. Indicative prerequisites	Database management systems (strong), Supply chain control (strong), Intralogistics (suggested)

19. Aim of the subject

Learning information management methods and tools that arise during logistics engineering activities.

20. Thematics of lectures

Introduction of enterprise softwares used in logistics systems. Product identification systems in the logistics processes of companies. Structure of automatic product identification systems, components, areas of their application. Information content of product identifiers, types. Types of readers, comparison of their operating characteristics. The role of standards in business processes, standard and non-standard data carriers, their comparison and application. Data management and communication in the supply chain. Standard tracking solutions. Telematics solutions.

21. Thematics of practices

-

22. Thematics of laboratories

1. Practicing of an enterprise resource planning system through lab sessions: master data management, order management, inventory, cash register management, invoicing.
2. Practicing standard automatic product identification solutions within the framework of lab sessions.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Knows the software and IT tools required for the operation of logistics processes (T1, T2)
2. Knows the basic operation of enterprise management systems (T1, T2)
3. Knows the operation of automatic product identification systems (T1, T2)

b) skills (k)

1. is able to review the structure of softwares used in logistics processes and understand their relationships (K4, K12, K31, K32, S1)
2. is able to manage enterprise management systems at the user level (K4, K31, K32, K34, S1)
3. is able to participate in the introduction of automatic product identification systems in logistics processes (K4, K29, K38, K39, S1)

c) attitude (a)

1. strives to develop appropriate information management processes in his/her professional work (A1, A2, A3, A4, A16)
2. is interested in new developments, has a cooperative attitude towards organizing information connections in logistics processes (A3, A4, A10, A14, A15, A17)

d) autonomy and responsibility (o)

1. is aware of the significance of his/her work and the consequences of mistakes made while solving tasks (O3, O4, O5, O6, O15, O17)
2. formulates independent proposals for solving the identified challenges (O2, O3, O4, O5, O6, O12, O15)

3. is able to self-monitor and independently correct mistakes after learning about the professional opinions of others (O2, O3, O4, O6, O17)
4. is aware of the importance of the division of tasks and leadership tasks in team work (O15)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test 2. second midterm test	1. ZH1 2. ZH2	1. 25% 2. 25%	1. t1-t3,k1-k3,a1,a2,o1-o4 2. t1-t3,k1-k3,a1,a2,o1-o4

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam	1. V	1. 50%	1. t1-t3,k1-k3,a1,a2,o1-o4

26. Conditions for obtaining signature / midterm grade

At least 50% completion of the midterm tests separately is required for the signature.

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The two midterm tests can be retaken once during the semester or the delayed completion period.

27. Final grade in percentage of performance

Excellent 80-100%
Good 70-80%
Satisfactory 60-70%
Pass 50-60%
Fail 0-50%

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Logistics modelling**				
2. … in Hungarian	Logisztikai modellezés			**3. Programme code**	I
4. Subject code				**5. Term | role**	**6 | k**
6. Credits	**7**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	26 hours	**Homework**	70 hours
Reading written materials	30 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Kovács Gábor	**15. Email address**	kovacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Kovács Gábor, Dr. Bóna Krisztián, Dr. Sárdi Dávid Lajos		

18. Indicative prerequisites	Mathematics A3l (strong), Statistical analyses in logistics (strong), Programming (suggested)

19. Aim of the subject

To familiarize students with the modeling principles, procedures, and methods applied in the field of logistics.

20. Thematics of lectures

Introduction to basic modeling knowledge. Fundamentals of process modeling, simpler process description languages. Fundamentals of simulation modeling, simpler simulation models. Modeling approaches applied in extra- and intralogistics systems; modeling goals. Fundamentals of modeling procedures applied in thematic logistics areas and their relationships. Fundamental application possibilities of artificial intelligence in logistics modeling.

21. Thematics of practices

-

22. Thematics of laboratories

Within the framework of the labs, students can apply the logistics models presented in the lectures in the appropriate environment.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows and applies the methods of modeling the supply chain, intra- and extra-logistics systems (T9, T17, T18)
2. knows the related mathematical background (T4)

b) skills (k)

1. able to perform basic analytical modeling and process design, process management and resource allocation in the field of extra- and intralogistics systems (K17, K21, K23, K28)
2. able to use available digital modeling tools (K31, K32, K39)

c) attitude (a)

1. strives to organize and execute modelling processes precisely during his/her work (A3, A4, A10)
2. interested in new things, has a cooperative attitude towards modelling processes (A5, A6, A14, A15, A16)

d) autonomy and responsibility (o)

1. independently responsible for modelling logistics processes, performing basic organizational and planning tasks (O2, O4, O5, O12, O15)
2. aware of the significance of his work and the consequences of mistakes (O3, O6, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. semester task 2. semester lab task	1. F 2. LF	1. 70% 2. 30%	1. t1,t2,k1,k2,a1,a2,o1,o2 2. t1,t2,k1,k2,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

At least 50% completion of each semester task.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The semester tasks can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Logistics project**				
2. … in Hungarian	Logisztikai projekt			**3. Programme code**	I
4. Subject code				**5. Term | role**	**6 | k**
6. Credits	**6**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**6 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	84 hours	**Preparation for seminars**	16 hours	**Homework**	64 hours
Reading written materials	16 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Sárdi Dávid Lajos	**15. Email address**	sardi.david@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Sárdi Dávid Lajos, Bakos András, Bertalan Marcell, Dr. Bohács Gábor, Dr. Bóna Krisztián, Dr. Kovács Gábor, Lénárt Balázs, Dr. Rinkács Angéla, Dr. Rózsa Zoltán, Dr. Sztrapkovics Balázs		
18. Indicative prerequisites	Freight transporting systems (strong), Logistics information systems (strong), - - -		

19. Aim of the subject

To familiarise students with the structure of logistics projects and to implement an independent project.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Demonstrate the basic structure, design and management of logistics projects through examples of real projects, in training-style laboratory sessions. Presentation and case study of different logistics projects that have been implemented, in training-style laboratory sessions. Design, planning and implementation of an own logistics project, related consultations with a supervisor.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knowledge of the structure of logistics projects (T5, S1, S2)
2. knowledge of the steps and solutions for planning, organizing and implementing logistics projects (T5, S1, S2)

b) skills (k)

1. is able to structure, plan and organize a logistics project (K1, K2, K3, K5, K8, K12, K13, K16, K20, K21, K23)
2. is able to participate in logistics projects and is able to manage logistics projects (K1, K2, K3, K5, K9, K12, K13, K14, K16, K17, K18, K21, K23, K31, K32, K34, K38, K40)

c) attitude (a)

1. strives to organize and carry out logistics projects in a precise manner (A2, A3, A4, A5, A6, A7, A8, A10, A11, A16)
2. is receptive and proactive in carrying out the tasks assigned to him/her in a logistics project, self-critical of the tasks assigned to him/her (A2, A3, A6, A7, A8, A11, A12)
3. is interested in new things, is cooperative when participating in a logistics project (A4, A5, A14, A15, A16)
4. strives to carry out tasks correctly, accurately and precisely when working on logistics projects (A2, A3, A5, A8)

d) autonomy and responsibility (o)

1. is independently responsible for the tasks assigned in a logistics project and the management of a logistics project (O1, O2, O3, O4, O5, O6, O7, O8, O9, O11, O12, O13, O14, O15, O17)
2. is aware of the importance of the work and the consequences of mistakes (O5, O6, O9, O11, O13, O14, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. independent project 2. presentation and oral report	1. PRO 2. PRE	1. 30% 2. 70%	1. t1,t2,k1,k2,a1-a4,o1,o2 2. t1,t2,k1,k2,a1-a4,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
At least 50% completion of each semester task.	Excellent 87,5-100% Good 75-87,5% Satisfactory 62,5-75% Pass 50-62,5% Fail 0-49%
28. Attendance and participation requirements	
According to the rules of CoS.	
29. Late completion opportunities	
The semester tasks can be retaken once during the semester or the delayed completion period.	

30. Consultation opportunities

At a time and in a form agreed with the teacher and the supervisor of the own logistics project.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Management and business economics**				
2. … in Hungarian	Menedzsment és vállalkozás gazdaságtan			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**3 lecture**	**0 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	20 hours	**Homework**	0 hours
Reading written materials	28 hours	**Midterm test preparation**	30 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Transport Technology and Economics		
14. Subject coordinator	Dr. Kővári Botond	**15. Email address**	kovari.botond@kjk.bme.hu
16. …department	Department of Transport Technology and Economics		
17. Lecturers	Dr. Kővári Botond		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

To familiarize students with the basic operations, economic, marketing and human resources tasks of companies, and to prepare them to perform managerial tasks in companies.

20. Thematics of lectures

General overview of companies, its environment, and company forms. Types of companies, foundation in the practise. Liquidation of the companies. Competition regulation. Features of a market. Company resources, processes. Evaluation of resources. Productivity indicators, correlations. Cost definitions, correlations. Human resource management. Basic tax knowledge. Innovation and its process. Management aspects of the transportation modes.

21. Thematics of practices

-

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the customer and market needs of companies' products (K,L:T2)
2. knows the costs incurred during production and the provision of services, their groups (K,L:T5)
3. is able to apply communication techniques in business life appropriately (K:T11)
4. is able to evaluate and determine the position of the market and companies, and set relevant goals (K:T15)
5. is able to evaluate basic data and information related to the market and the operation of the company (K:T9,T12;L:T9)

b) skills (k)

1. analyzes market needs, manages customers, performs marketing tasks (K,L:K1,K2,K5)
2. effectively manages company processes, controls costs (K:K3,K8,K30;L:K33)
3. uses communication with competitors and partners, supports decisions with economic studies (K:K7,K9,K12,K31;L:K34,S1)
4. analyzes alternative decisions, the offered portfolio, economic factors related to production (K:K16,K19,K21)
5. examines market conditions, characteristics, is able to plan the delivery of products (K:K20,K26,K29;L:K20,K32)

c) attitude (a)

1. strives to the best of his/her abilities to solve complex economic tasks (K,L:A1,A2,A4,A5,A11,A12)
2. strives to solve complex problems in his/her work, always taking into account multiple aspects (K,L:A7,A8,A9,A13;K:A14,A15,A18,A22)

d) autonomy and responsibility (o)

1. is able to solve economic and marketing problems independently or as part of a team to a high standard (K,L:O4,O5,O6,O10)
2. feels responsible for the results and quality of his work (K,L:O7,O8,O11;K:O18)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,t2,t3,t4,t5,k1,k2,k3,k4,k5,a1,a2,o1,o2 2. t1,t2,t3,t4,t5,k1,k2,k3,k4,k5,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

successful (min. 50%) completion of the midterm test

27. Final grade in percentage of performance

Excellent 88-100%
Good 75-87%
Satisfactory 63-74%
Pass 50-62%
Fail 0-49%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Second retake or delayed completion is only from one midterm requirement.

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Material technology, industrial manufacturing systems**				
2. … in Hungarian	Anyagtechnológia, ipari gyártórendszerek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**3**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**90 hours**
Contact hours	28 hours	**Preparation for seminars**	10 hours	**Homework**	0 hours
Reading written materials	20 hours	**Midterm test preparation**	32 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Automotive Technologies		
14. Subject coordinator	Dr. Pál Zoltán	**15. Email address**	pal.zoltan@kjk.bme.hu
16. …department	Department of Automotive Technologies		
17. Lecturers	Dr. Bán krisztián, Dr. Markovits Tamás, Dr. Pál Zoltán, Dr Varga Ferenc lászló		
18. Indicative prerequisites	- - -, - - -, - - -		

19. Aim of the subject

Providing logistics engineers with the basic knowledge of materials and manufacturing technology necessary to perform their tasks.

20. Thematics of lectures

Overview of automotive raw materials, metal alloys and their characteristics, important material testing procedures. Main groups of steel and aluminum raw materials, their heat treatment. Basics of typical component manufacturing processes (casting, metal forming, machining, surface modification). Subassembly manufacturing processes (bonding technologies, assembly technology, basics of technological sequence). Design of types of industrial manufacturing systems and main system elements. Basics of quality assurance.

21. Thematics of practices

-

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Knows the main types of raw materials and their main characteristics and the basics of testing methods. (T7)
2. Knows the basics of the main parts and components manufacturing processes and the specifics of manufacturing systems. (T1,T7,T18,S2)
3. Knows the quality assurance aspects related to manufacturing. (T1,T18)

b) skills (k)

1. is able to take production aspects into account based on the procedures and methods described and, where appropriate, apply them to their own tasks. (K14,K15,K17,K36,S1)

c) attitude (a)

1. is open to new opportunities and solutions in the field. (A5,A6,A14,A15,A16)

d) autonomy and responsibility (o)

1. Can be involved in tasks and processes. (O3,O4,O5,O6,O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,t2,t3,k1,a1,o1 2. t1,t2,t3,k1,a1,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
A midterm test is passed if more than 50% of the maximum score is achieved. The midterm grade is awarded on the basis of two "passed" midterm test.	0-<50%: fail (1), 50-<62%: pass (2), 62-<75%: satisfactory (3), 75-<87%: good (4), 87-100%: excellent (5).
28. Attendance and participation requirements	
According to TVSZ	
29. Late completion opportunities	
The midterm tests can be retaken once.	

30. Consultation opportunities
Every lecture
31. Validity of the subject datasheet starts from:
01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Mathematics A1a**				
2. … in Hungarian	Matematika A1a			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**1 | k**
6. Credits	**6**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**4 lecture**	**2 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	84 hours	**Preparation for seminars**	34 hours	**Homework**	0 hours
Reading written materials	6 hours	**Midterm test preparation**	24 hours	**Exam preparation**	32 hours
13. Organisational unit in charge	Department of Stochastics (TTK)				
14. Subject coordinator	Bodrogné Dr. Réffy Júlia Anna	**15. Email address**	reffyj@math.bme.hu		
16. …department	Department of Analysis and Operations Research (TTK)				
17. Lecturers	Dr. Sándor Csaba, Dr. Mikovszki Tamás				
18. Indicative prerequisites	- - -, - - -, - - -				

19. Aim of the subject

Students will learn the basics of mathematics and the fundamental mathematical concepts needed for technical thinking. In addition to this, students will develop their problem-solving skills and develop a commitment to precise, demanding engineering work through practical tasks.

20. Thematics of lectures

Students will learn the basics of mathematics: the use of complex numbers, differential calculus of univariate real functions, integral calculus, the analytic geometry of three-dimensional Euclidean space.

21. Thematics of practices

Students will learn the basic mathematical concepts necessary for technical thinking: the use of complex numbers, differential calculus of univariate real functions, integral calculus, analytic geometry of three-dimensional Euclidean space. In addition to this, students will develop their problem-solving skills and, through practice-oriented tasks, will develop a commitment to precise, demanding engineering work.

22. Thematics of laboratories

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Understand the principles and methods of mathematics applied in the field of engineering (T4) 2. Know the general and specific mathematical, scientific and social principles, rules, contexts and procedures for the operation of vehicles and mobile machinery (T9)

b) skills (k)

1. Demonstrates an understanding of mathematical concepts and expressions and the application of basic mathematical principles and processes to the interpretation of data and facts (K11)

c) attitude (a)

1. Choose from several options (A4)

d) autonomy and responsibility (o)

-

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH1	1. 13%	1. t1,k1,a1
2. midterm test	2. ZH2	2. 13%	2. t1,k1,a1
3. midterm test	3. ZH3	3. 14%	3. t1,k1,a1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Exam papers	1. V	1. 60%	1. t1,k1,a1

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
At least 30% completion of each midterm tests	Excellent 86-100%, 71-85%, satisfactory 55-69%, pass 40-54%, fail 0-39%
28. Attendance and participation requirements	
according to the rules of CoS	
29. Late completion opportunities	
The midterms can only be retaken once	

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Mathematics A2a**				
2. … in Hungarian	Matematika A2a			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**6**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**4 lecture**	**2 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**180 hours**
Contact hours	84 hours	**Preparation for seminars**	34 hours	**Homework**	0 hours
Reading written materials	6 hours	**Midterm test preparation**	24 hours	**Exam preparation**	32 hours

13. Organisational unit in charge	Department of Stochastics (TTK)		
14. Subject coordinator	Dr. Rónyai Lajos	**15. Email address**	lajos@math.bme.hu
16. …department	Department of Algebra and Geometry (TTK)		
17. Lecturers	Dr. Sándor Csaba, Dr. Mikovszki Tamás		

18. Indicative prerequisites

Mathematics A1a (strong),
- - -,
- - -

19. Aim of the subject

Students will learn the basics of mathematics and the fundamental mathematical concepts needed for technical thinking. In addition to this, students will develop their problem-solving skills and develop a commitment to precise, demanding engineering work through practical tasks.

20. Thematics of lectures

Students will learn the basics of mathematics: the main concepts and methods of linear algebra; the fundamental properties of multivariable functions; and the important series in engineering applications.

21. Thematics of practices

Students will learn the basic mathematical concepts necessary for engineering thinking: the main concepts and methods of linear algebra; the basic properties of multivariable functions; and the important series for engineering applications. In addition to this, students will develop their problem-solving skills and, through practice-oriented tasks, will develop a commitment to precise, demanding engineering work.

22. Thematics of laboratories

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Understand the principles and methods of mathematics applied in the field of engineering (T4) 2. Know the general and specific mathematical, scientific and social principles, rules, contexts and procedures for the operation of vehicles and mobile machinery (T9)

b) skills (k)

1. Demonstrates an understanding of mathematical concepts and expressions and the application of basic mathematical principles and processes to the interpretation of data and facts (K11)

c) attitude (a)

d) autonomy and responsibility (o)

-

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test	1. ZH1 2. ZH2	1. 20% 2. 20%	1. t1,k1 2. t1,k1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Exam papers	1. V	1. 60%	1. t1,k1

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
At least 30% completion of each midterm tests	Excellent 86-100%, 71-85%, satisfactory 55-69%, pass 40-54%, fail 0-39%
28. Attendance and participation requirements	
according to the rules of CoS	
29. Late completion opportunities	
The midterms can only be retaken once	

30. Consultation opportunities
at a time and in a form agreed with the teacher
31. Validity of the subject datasheet starts from:
01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Mathematics A3I**				
2. … in Hungarian	Matematika A3I			**3. Programme code**	I
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	56 hours	**Preparation for seminars**	30 hours	**Homework**	0 hours
Reading written materials	10 hours	**Midterm test preparation**	24 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Analysis and Operations Research (TTK)		
14. Subject coordinator	Kovács Edith Alice	**15. Email address**	kovacsea@math.bme.hu
16. …department	Department of Analysis and Operations Research (TTK)		
17. Lecturers	Nagyné Csóti Beáta		
18. Indicative prerequisites	Mathematics A2a (strong), - - -, - - -		

19. Aim of the subject

Students will learn the basics of mathematics and the fundamental mathematical concepts needed for technical thinking. In addition to this, students will develop their problem-solving skills and develop a commitment to precise, demanding engineering work through practical tasks.

20. Thematics of lectures

21. Thematics of practices

22. Thematics of laboratories

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. Know the general and specific mathematical, scientific and social principles, rules, contexts and procedures for the operation of vehicles and mobile machinery (T9)

b) skills (k)

c) attitude (a)

d) autonomy and responsibility (o)

-

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test	1. ZH1 2. ZH2	1. 50% 2. 50%	1. t1,k1 2. t1,k1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade	**27. Final grade in percentage of performance**
At least 30% completion of each midterm tests	

28. Attendance and participation requirements	Excellent 86-100%, 71-85%, satisfactory 55-69%, pass 40-54%, fail 0-39%
according to the rules of CoS	
29. Late completion opportunities	
The midterms can only be retaken once	
30. Consultation opportunities	
at a time and in a form agreed with the teacher	
31. Validity of the subject datasheet starts from:	
01 September, 2025	

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Packaging technology**				
2. … in Hungarian	Csomagolástechnika			**3. Programme code**	I
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**1 lecture**	**1 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	16 hours	**Homework**	30 hours
Reading written materials	7 hours	**Midterm test preparation**	25 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Kovács Gábor	**15. Email address**	kovacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Kovács Gábor, Bakos András		

18. Indicative prerequisites	Visualization technologies (suggested), Value creation systems (suggested), - - -

19. Aim of the subject

To familiarize students with the basic knowledge of packaging technology related to logistics, which can be used in practice, and with the basics of packaging design.

20. Thematics of lectures

Basic concepts, tasks of packaging, role of packaging in the national economy. Classification of packages, packaging materials, types of materials, packaging equipment. Tools, principles, process, technology of unit load build-up. Stacking of unit loads. Computerized unit load making. Packaging optimization, packaging design, economics of packaging, technical - economic indicators of packaging. Connection of packaging technology to supply, production, distribution logistics. The role of packaging information, elements, packaging as a means of product identification. Packaging technology, packaging machines.

21. Thematics of practices

Solution of the calculation related to the selection of transport packaging that fits a given consumer packaging product, the development of an optimal pallet unit load. The placement of information bearing objects. Preparing for homework.

22. Thematics of laboratories

Computer-aided packaging design. 3D packaging design. Unit load creation under laboratory conditions. Vehicle loading plan creation with the aid of softwares.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basics of packaging technology and the material used (T1, T2, T3)
2. knows the logistics aspects, requirements and design tools of packaging technology (T8, T10, T12)

b) skills (k)

1. can design and use transport packages and unit loads correctly (K6, K9, K13, K14, K15, K17, K20, K22)
2. able to use packaging design software (K40)

c) attitude (a)

1. strives to organize and execute packaging processes precisely during his/her work (A3, A4, A10, A17)
2. interested in new things, has a cooperative attitude towards organizing packaging processes (A5, A6, A14, A15, A16)

d) autonomy and responsibility (o)

1. independently responsible for operating packaging processes, performing basic organizational and planning tasks (O2, O4, O5, O12, O15)
2. aware of the significance of his work and the consequences of mistakes (O3, O6, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. semester task	1. ZH 2. F	1. 40% 2. 60%	1. t1,t2,k1,k2,a1,a2,o1,o2 2. t1,t2,k1,k2,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

At least 50% performance of each the midterm test and the semester task is the condition of the final grade.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test and the semester task can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Professional orientation**				
2. … in Hungarian	Szakmai orientáció			**3. Programme code**	I
4. Subject code				**5. Term | role**	**7 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**3 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	17 hours	**Homework**	30 hours
Reading written materials	31 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Kovács Gábor	**15. Email address**	kovacs.gabor@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Kovács Gábor, Dr. Bóna Krisztián		

18. Indicative prerequisites	Logistics information systems (strong), Freight transporting systems (strong), Future technolgies in logistics (suggested)

19. Aim of the subject

Jointly defining the further professional development direction of students close to graduation and providing personalized support, with developing soft competencies.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Within the framework of the labs, students receive personalized academic support in furthering their professional career path, whether it be further study in a master's program, research and development, or engineering work. Depending on the case, these take place either in university labs, trainings or during company visits.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

-

b) skills (k)

1. builds her/his professional network of contacts through appropriate communication (K2, K7)

c) attitude (a)

1. interested in his profession, committed, motivated to develop and learn, adheres to general social norms (A1, A2, A3, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A18)

d) autonomy and responsibility (o)

1. able to work independently and in a team, suitable for knowledge transfer, confident and aware of responsibility (O1, O4, O7, O8, O9, O10, O11, O13, O14, O16)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. semester task	1. F	1. 100%	1. k1,a1,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade	27. Final grade in percentage of performance
At least 50% completion of the semester task.	Excellent 87,5-100% Good 75-87,5% Satisfactory 62,5-75% Pass 50-62,5% Fail 0-49%
28. Attendance and participation requirements	
According to the rules of CoS.	
29. Late completion opportunities	
The semester task can be retaken once during the semester or the delayed completion period.	
30. Consultation opportunities	
At a time and in a form agreed with the teacher.	
31. Validity of the subject datasheet starts from:	
01 September, 2025	

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Programming**				
2. … in Hungarian	Programozás			**3. Programme code**	jkl
4. Subject code				**5. Term | role**	**1 | k**
6. Credits	**7**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	36 hours	**Homework**	40 hours
Reading written materials	10 hours	**Midterm test preparation**	40 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Control for Transport and Vehicle Systems		
14. Subject coordinator	Dr. Bécsi Tamás	**15. Email address**	becsi.tamas@kjk.bme.hu
16. …department	Department of Control for Transport and Vehicle Systems		
17. Lecturers	Dr. Bécsi Tamás, Dr. Fehér Árpád, Dr. Szabó Ádám, Dr. Törő Olivér		
18. Indicative prerequisites	- - -, - - -, - - -		

19. Aim of the subject

To develop the algorithmic thinking of engineering students through the teaching of a selected, widespread programming language.

20. Thematics of lectures

During the lecture, students will learn about the need for programming, control structures (branches, loops), data management, and the use of functions and data structures. The lecture introduces the fundamentals of algorithm theory and the basics of the object-oriented approach. Students will learn debugging, file management, and the application of basic algorithms (searching, sorting) through practical examples. The course prepares students for further programming and computer science studies.

21. Thematics of practices

-

22. Thematics of laboratories

The lab sessions help to deepen the practical learning of the lecture. As part of this, students perform basic programming and algorithm design tasks independently, with the help of a qualified instructor.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basic concepts of computer science (K:T17;J:T21;L:T21)
2. knows the basic concepts of structured programming and the syntax of a language studied in the course (K:T17;J:T21;L:T21)
3. knows elementary algorithm design methods and their implementation options (K:T16;J:T17)
4. has knowledge of the basics of object-oriented programming (K:T16;J:T17)

b) skills (k)

1. Able to understand, model and measure the functioning of the physical world using digital tools, as well as to explore cause-and-effect relationships and apply them in rule-based systems. (J,K,L:K10)
2. Able to process structured data, effectively search, evaluate and manage digital content. (K:K28,K29,K30,K31;J:K36,K37,K38,K39;L:K31,K32,K33,K34)
3. Able to design, program, operate and test IT systems based on models. (K:K12,K32,K34,K35,K36;J:K12,K40,K42,K43,K44;L:K12,K35,K37,K38,K39)

c) attitude (a)

1. Recognizes and accepts that designing, programming, and applying digital systems involves responsibility, and strives to understand, take ownership of, and respect the consequences of professional decisions — both for themselves and others. (J,K,L:A2)
2. Strives to critically assess and select from various digital technology solutions, and to apply them in a way that achieves the desired goals with minimal use of time, effort, or resources. (J,K,L:A4,A10)

d) autonomy and responsibility (o)

1. Makes decisions independently and responsibly during the design and implementation of digital solutions, is capable of identifying and correcting own mistakes, and formulates proposals for optimal programming steps in a creative manner. (J,K,L:O2,O3)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test 2. midterm test 3. programming homework	1. ZH1 2. ZH2 3. HF	1. 1/3 2. 1/3 3. 1/3	1. t1,t2,k1 2. t3,t4,k2,k3 3. a1,a2,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

A minimum 40% average of ZH1 and ZH2, and a minimum 40% result of HF.

27. Final grade in percentage of performance

Excellent: 85–100%
Good: 70–84%
Satisfactory: 55–69%
Pass: 40–54%
Fail: 0–39%

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

Only one of the mid-semester requirements can be made up through repeated replacement.

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Statistical analyses in logistics**				
2. … in Hungarian	Statisztikai elemzések a logisztikában			**3. Programme code**	I
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**2 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	16 hours	**Homework**	32 hours
Reading written materials	24 hours	**Midterm test preparation**	24 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Sárdi Dávid Lajos	**15. Email address**	sardi.david@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Sárdi Dávid Lajos, Dr. Bóna Krisztián, Dr. Rinkács Angéla		

18. Indicative prerequisites	Mathematics A2a (strong), Database management systems (strong), Visualization technologies (suggested)

19. Aim of the subject

To familiarise students with the basic descriptive and inferential statistical methodologies used in logistics planning.

20. Thematics of lectures

Recording statistical data, possible solutions for statistical sampling. Structure of statistical tables, tools for representing statistical data. Interpretation of general statistics, the role of descriptive statistical tests in evaluating the functioning of logistics systems. The role of basic statistical indicators in determining the properties of a statistical sample, basic indices and ratios in descriptive statistics. Methods of calculating typical means, averages and their interpretation. Methods of calculation of the variability and their interpretation. Interpretation and basics of inferential statistical tests and their role in the evaluation of logistic systems. Estimation and hypothesis testing, statistical error and reliability. Correlation and regression analysis. Analysis of time series data, trend analysis, seasonality, prediction.

21. Thematics of practices

Demonstration of the methods of statistical analysis presented in the lectures through practical examples, solving independent practical exercises. Practice solving statistical analysis problems based on independent practical exercises. Deepening of knowledge through the solution of homework.

22. Thematics of laboratories

Introduction to statistical analysis tools, demonstrating the statistical analysis methods presented in the lecture through complex practical examples based on indepentendent laboratory tasks. Basic statistical analysis solutions, plug-ins and features of spreadsheet editor software and their application based on indepentendent laboratory tasks. Demonstrate and learn how to use other statistical and data analysis software based on indepentendent laboratory tasks.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basic concepts of statistics, the basics of data tables (T4)
2. knows the methods of descriptive statistics and inferential statistics, and their logistic applications (T4)

b) skills (k)

1. is able to construct and prepare data tables for descriptive and inferential statistical analyses (K4, K31, K32, S1)
2. is able to apply basic descriptive and inferential statistical methods to solve logistics problems (K11, K29, K32, S2)

c) attitude (a)

1. strives to carry out statistical analyses correctly, accurately and precisely (A5, A6, A10, A14, A15, A16)

d) autonomy and responsibility (o)

1. is independently responsible for carrying out basic statistical analyses (O3, O4, O6)
2. is aware of the importance of his/her work and the consequences of mistakes (O3, O4, O5, O6)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. semester task 2. semester task 3. midterm test	1. HF1 2. HF2 3. ZH	1. 10% 2. 10% 3. 30%	1. t1,t2,k1,k2,a1,o1,o2 2. t1,t2,k1,k2,a1,o1,o2 3. t1,t2,k1,k2,a1,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written exam	1. V	1. 50%	1. t1,t2,k1,k2,a1,o1,o2

26. Conditions for obtaining signature / midterm grade

Completion of at least 50% of the semester tasks and at least 50% of the midterm test separately, and completion of the laboratory tasks.

27. Final grade in percentage of performance

Excellent 85-100%
Good 70-85%
Satisfactory 60-70%
Pass 50-60%
Fail 0-50%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The midterm test and the semester tasks can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Supply chain control**				
2. … in Hungarian	Ellátási lánc irányítás			**3. Programme code**	I
4. Subject code				**5. Term | role**	**3 | k**
6. Credits	**7**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**2 practice**	**2 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**210 hours**
Contact hours	84 hours	**Preparation for seminars**	26 hours	**Homework**	25 hours
Reading written materials	20 hours	**Midterm test preparation**	25 hours	**Exam preparation**	30 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Bóna Krisztián	**15. Email address**	bona.krisztian@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Bóna Krisztián, Dr. Sárdi Dávid, Bertalan Marcell		

18. Indicative prerequisites	Value creation systems (strong), Material technology, industrial manufacturing systems (suggested), Database management systems (suggested)

19. Aim of the subject

Describing the structure and operation of the value (supply) chain and its characteristics. Presenting the operational background of companies integrated in the value chain. Solutions for the management and control of the enterprise value chain operation, presenting of the methodological background of the applied tools.

20. Thematics of lectures

The structure and actors of supply chains and value chains and networks. Material supply (procurement), production, distribution (sales) and waste management systems. Functions of enterprise operations management, the S&OP process. Outputs of value creating systems, components of products and services. The BOM list and the technological sequence, determination of material requirements. Assortment analysis, classification procedures. Analysis and planning procedures for the demand process. Typical purchasing and production strategies to meet external and internal needs. Selection of suppliers, supplier relationship management. Types of disposition procedures, inventory management, MRP procedures. Concepts and objectives of production planning and management, methodological background of strategic and tactical planning. Basics of production scheduling, objectives, simpler production scheduling solutions.

21. Thematics of practices

Practical exercises related to the modelling of the Bill of Material (BOM). Practical calculation exercises related to the determination of primary and secondary material requirements. Practial calculation excersises related to the procedures of assortment analysis. Practicing calculation methods for analysing and planning requirements. Practical exercises on the methodological background of inventory control. Exercise tasks related to the analysis of production systems and the methodological background of production control.

22. Thematics of laboratories

IT implementations of the Bill of Material (BOM). IT implementations of calculation methods for primary and secondary requirements. Methods for the IT implementations of assortment analysis methods. IT tools and their applications in analysis of demand process and in the several demand planning procedures. IT implementations of the methods and models applied in inventory control. IT implementations of tactical and operational planning methods in production control.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the concept, structure, actors and processes of the value (supply) chain (T2, T8)
2. knows the systems of procurement, production, sales and waste management, the challenges of managing the company's operations (T8, T9, T10)
3. can analyse the outputs and types of materials handled (T2, T17)
4. knows the procedures used to determine material requirements (T10, T17)
5. understands the challenges of demand planning and knows the procedures to be applied (T9, T17, T18)
6. knows the methods used to manage and control inventories (T9, T17)

7. knows the methods used to manage and control production (T9, T18)

b) skills (k)

1. is able to identify the tasks, problems and challenges in the management of corporate operations (K1, K9, K19, K20, K24, K26, S1)
2. applies the analytical procedures learned in the assortment analisys in the categorisation of outputs and materials (K9, K15, K16)
3. is able to apply the BOM management tools and interpret data for material requirements planning (K9, K15, K16, S1, S2)
4. can apply material requirements planning procedures (K9, K15, K28, K30)
5. is able to use the methodological background learned in planning and analysing the demand (K1, K9, K15, K30)
6. is able to analyse inventory systems and processes, to improve processes and to apply the methods learned in operational management (K9, K15, K28, K30)
7. is able to analyse production systems and processes, to improve processes and to apply the methods learned in operational management (K9, K15, K19, K21, K30, K36, S2)

c) attitude (a)

1. seeks to be comprehensive in the acquisition of knowledge, cooperates with the teacher and fellow students, is empathetic and tolerant (A5, A15, A16)
2. is receptive and proactive in carrying out the tasks assigned to him/her, self-critical of the tasks assigned to him/her (A3, A5, A6, A14)
3. interested in new things, receptive to new knowledge (A5, A6, A14, A15, A16, A17)
4. tries to carry out tasks correctly, accurately and precisely (A16, A17)
5. thinks in variations, strives to achieve results of appropriate quality in the shortest possible lead time (A4, A10)

d) autonomy and responsibility (o)

1. is aware of the importance of his/her work and the consequences of mistakes (O3, O4, O17)
2. complies with environmental and social requirements in his/her chosen professional field (O3, O4)
3. formulates independent proposals to address the challenges identified (O2, O3, O4, O12, O15)
4. is able to self-ckeck and correct errors independently by listening to the professional opinions of others (O3, O4)
5. is able to take responsibility for his/her opinions and actions and to form his/her own opinions (O5, O6)
6. is critical of his/her own work and that of others (O5, O6)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test	1. ZH1	1. 17,5%	1. t1-t7,k1-k6,a1-a5,o1-o6
2. second midterm test	2. ZH2	2. 17,5%	2. t1-t7,k1-k6,a1-a5,o1-o6
3. first practical small task	3. KF1	3. 2%	3. t1-t7,k1-k6,a1-a5,o1-o6
4. second practical small task	4. KF2	4. 2%	4. t1-t7,k1-k6,a1-a5,o1-o6
5. third practical small task	5. KF3	5. 2%	5. t1-t7,k1-k6,a1-a5,o1-o6
6. fourth practical small task	6. KF4	6. 2%	6. t1-t7,k1-k6,a1-a5,o1-o6
7. fifth practical small task	7. KF5	7. 2%	7. t1-t7,k1-k6,a1-a5,o1-o6
8. sixth prctical small task	8. KF6	8. 2%	8. t1-t7,k1-k6,a1-a5,o1-o6
9. seventh practical small task	9. KF7	9. 3%	9. t1-t7,k1-k6,a1-a5,o1-o6

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. Written prerequisite test	1. BE	1. 0%	1. t1-t7,k1-k6,a1-a5,o1-o6
2. Oral exam	2. V	2. 50%	2. t1-t7,k1-k6,a1-a5,o1-o6

26. Conditions for obtaining signature / midterm grade

At least 50% performance of each of the midterm tests and at least sum 50% performance in the sevel small practical tasks the condition of the signature.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The two midterm tests can be retaken once during the semester or the delayed completion period. In the case of small practical tasks, a maximum of four small tasks out of seven choosen by the student can be resubmitted if the student has not reached 50% of the total points of the seven small tasks.

30. Consultation opportunities

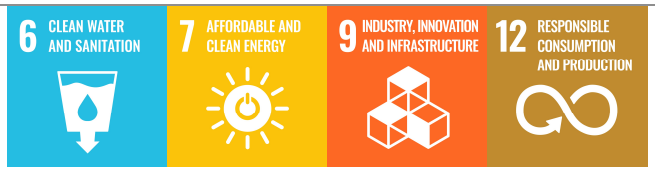
At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Technical chemistry**				
2. … in Hungarian	Műszaki kémia			**3. Programme code**	jkl
4. Subject code	**BMEVEKTAKO1**			**5. Term | role**	**1 | k**
6. Credits	**3**	**7. Evaluation type**	**e**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**0 practice**	**1 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**90 hours**
Contact hours	42 hours	**Preparation for seminars**	11 hours	**Homework**	3 hours
Reading written materials	20 hours	**Midterm test preparation**	4 hours	**Exam preparation**	10 hours

13. Organisational unit in charge	Department of Chemical and Environmental Process Engineering (VBK)		
14. Subject coordinator	Dr. Kun Róbert	**15. Email address**	kun.robert@vbk.bme.hu
16. …department	Department of Chemical and Environmental Process Engineering (VBK)		
17. Lecturers	Dr. Kun Róbert		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

The aim of the course is to provide students with fundamental chemical knowledge related to energy production, technical fluids, and structural materials, and to apply this knowledge in practice. Students will gain insight into the chemistry of energy carriers, fuels, water treatment, lubricants, corrosion protection, and electrochemical power sources, along with relevant laboratory testing methods.

20. Thematics of lectures

An overview of general chemistry knowledge to understand the curriculum. Chemical aspects of energy production, environmental issues: Basic concepts of combustion technology, Coal (in brief), Petroleum and natural gas as energy and chemical raw materials (overview), Properties of motor fuels, production, combustion, exhaust gas cleaning, Principle of nuclear energy release, nuclear reactors (in brief), Characterization of alternative energy sources (in general), Alternative motor fuels, Chemical power sources (galvanic cells, batteries, fuel cells). Technical fluids: Characterization, preparation, wastewater and treatment of waters used in industrial practice, Characterization, production, grouping, wear of lubricants (mainly motor oils). Chemistry of structural materials: General properties of structural materials, Main types of ceramics, their properties, Structure and properties of metals, production (in brief), corrosion and corrosion protection of major metals, metals, Characterization of macromolecules, main types, properties of plastics, their production (in brief).

21. Thematics of practices

.

22. Thematics of laboratories

Catalytic cleaning of Otto engine exhaust, engine energy balance, Ion exchange water treatment, Lubricants (engine oils and machine greases), Electrochemistry (chemical power sources, electrolysis), Corrosion of metals

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basic thermodynamic laws of chemical transformations, electrochemical relations related to electrochemical corrosion, (J,K,L:T7)
2. is familiar with the content, context and environmental impact of basic technical terms related to combustion technology, (J,K,L:T2)
3. knows the types of crude oil and the names of the fractions that can be obtained from them, the most important properties of each type of fuel and lubricant (J,K,L:T7)
4. is familiar with drinking water and wastewater treatment sub-technologies (J,K,L:T7)

b) skills (k)

1. is able to detect the possibility of electrochemical corrosion and intervene in the case of metallic structural materials, (J,K,L:K10,K17;J:36;K:28;L:31)
2. is able to assess the energy content and quality of each fuel and lubricant, the technical consequences of their use and the environmental impact, (J,K,L:K10,K17;J:36;K:28;L:31)

3. is able to perform simpler operational tasks with the knowledge of wastewater and drinking water treatment procedures. (J,K,L:K10,K17;J:36;K:28;L:31)

c) attitude (a)

1. cooperates with the lecturer and fellow students in expanding the knowledge, expands his / her knowledge by continuous acquisition of knowledge,

2. open to the use of information technology tools, sensitive to environmental issues,

3. strives for the accurate and error-free solution of tasks, in its work it purposefully co-operates with experts in border area topics. (J,K,L:A2)

d) autonomy and responsibility (o)

1. solves tasks and problems independently or together with experts in other fields, openly receives well-founded critical remarks (J,K,L:O3)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. laboratory measurements' reports 2. midterm test 3. optional: five homeworks issued on lectures	1. LJ 2. ZH 3. FHF	1. 30% 2. 0% 3. 0%	1. t1-t4,k1-k3,a1-a3,o1 2. t1-t4,k1-k3 3. k1-k3,a1-a3,o1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. written exam	1. V	1. 70%	1. t1-t4,k1-k3,a1-a3,o1

26. Conditions for obtaining signature / midterm grade

Required: Write a report on laboratory measurements. Optional: 5 homework assignments issued at the lecture, chemical calculation related to the curriculum (max. 5 * 2 extra points), independent processing of the topic related to the material in a dissertation, max. 20 extra points. One grade (score) in each lab. Conditions for admission to the exam: at least 50% midterm test and max. at least 50% of the laboratory score, or the max. at least 60% of the laboratory score.

27. Final grade in percentage of performance

0%-45%: fail; 46%-60%: pass; 61%-70%: satisfactory; 71-80%: good; 81%-100%: excellent

28. Attendance and participation requirements

according to the rules of CoS

29. Late completion opportunities

One midterm test can be re-taken once in the study period or in the delayed completion week.

30. Consultation opportunities

at a time and in a form agreed with the teacher

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Value creation systems**				
2. … in Hungarian	Értékteremtő rendszerek			**3. Programme code**	I
4. Subject code				**5. Term | role**	**1 | k**
6. Credits	**4**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**2 lecture**	**1 practice**	**0 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**120 hours**
Contact hours	42 hours	**Preparation for seminars**	18 hours	**Homework**	0 hours
Reading written materials	20 hours	**Midterm test preparation**	40 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Dr. Bóna Krisztián	**15. Email address**	bona.krisztian@kjk.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Dr. Bóna Krisztián, Bertalan Marcell		
18. Indicative prerequisites	- - -, - - -, - - -		

19. Aim of the subject

To define the value-creating systems that provide the environment, physical and technical background of logistics engineering, to interpret the value-creating processes taking place in them, and to lay the foundations for the professional subjects that build on them.

20. Thematics of lectures

Understanding value creating systems and processes, the concepts of value and loss. Types of value creating systems, the flow processes of value creation. The role of logistics in value creation systems. The structure of logistics processes. Characterisation of corporate logistics systems. Methods of modelling and analysis of value creation processes. Indicators to characterise value creating processes. Timing of value-creating processes, typical lead time definitions, joining methods of operational processes. Definitions of time bases and methods of calculation. Determining the capacity and utilisation of value-adding systems. Means to increase capacity utilisation. Open and hidden reserves. Main components of the infrastructure of value creating systems. The main logistics system components. Information technology solutions supporting information flows. Transparency, traceability, controlability.

21. Thematics of practices

Practising the application of structured process description and graphical representation tools. Practical exercises on the calculation of process indicators. Practising the application of methods for organising the timing of value-creation processes. Practical exercises on the calculation of time base. Practising the calculation of the capacity and utilisation of value-creation systems. Exercise tasks on calculation capacity reserves and utilisation increase.

22. Thematics of laboratories

-

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the concepts of value-creating systems and processes, their types, and the concepts of value and loss (T2, T8)
2. knowledge of corporate logistics systems that support value creation (T2, T8, S1)
3. identify the basic tools that can be used to analyse value-creating processes (T2, T8)
4. understand the components of the physical infrastructure of value creation systems (T2, T8, S2)

b) skills (k)

1. can distinguish between value-creating, necessary but not value-creating, and loss-generating activities (K1, K3)
2. apply simple tools to formalize value-creation processes (K19, K21, K23)
3. can interpret and calculate basic indicators to qualify value-creation processes (K20)
4. can identify the basic systems engineering components required to create value (K21, K23)

c) attitude (a)

1. seeks to be comprehensive in the acquisition of knowledge, cooperates with the teacher and fellow students, is empathetic and tolerant (A5, A15, A16)
2. is receptive and proactive in carrying out the tasks assigned to him/her, self-critical of the tasks assigned to him/her (A5, A6, A14)
3. interested in new things, receptive to new knowledge (A5, A6, A14, A15, A16, A17)
4. tries to carry out tasks correctly, accurately and precisely (A16, A17)

d) autonomy and responsibility (o)

1. is aware of the importance of his/her work and the consequences of mistakes (O3, O4)
2. complies with environmental and social requirements in his/her chosen professional field (O3, O4)
3. formulates independent proposals to address the challenges identified (O3, O4)
4. is able to self-check and correct errors independently by listening to the professional opinions of others (O3, O4)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test	1. ZH1	1. 42,5%	1. t1-t4,k1-k4,a1-a4,o1-o4
2. second midterm test	2. ZH2	2. 42,5%	2. t1-t4,k1-k4,a1-a4,o1-o4
3. first practical small task	3. KF1	3. 3%	3. t1-t4,k1-k4,a1-a4,o1-o4
4. second practical small task	4. KF2	4. 3%	4. t1-t4,k1-k4,a1-a4,o1-o4
5. third practical small task	5. KF3	5. 3%	5. t1-t4,k1-k4,a1-a4,o1-o4
6. fourth practical small task	6. KF4	6. 3%	6. t1-t4,k1-k4,a1-a4,o1-o4
7. fifth practical small task	7. KF5	7. 3%	7. t1-t4,k1-k4,a1-a4,o1-o4

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

The student has achieved minimum 30% for each of the two midterm tests and minimum 50% for the total points of two midterm tests, morover minimum 50% for the total points for all the practical small tasks.

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The two midterm tests can be retaken once during the semester or the delayed completion period. Three of the practical small tasks, chosen by the student, can be resubmitted.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
Faculty of Transportation Engineering and Vehicle Engineering

Subject datasheet

1. Subject name	**Visualization technologies**				
2. … in Hungarian	Vizualizációs technológiák			**3. Programme code**	I
4. Subject code				**5. Term | role**	**2 | k**
6. Credits	**5**	**7. Evaluation type**	**m**	**8. Form**	**with contact hours**
9. Weekly contact hours	**0 lecture**	**0 practice**	**4 laboratory**	**10. Language**	**English**
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals					
12. Working hours for fulfilling the requirements of the subject					**150 hours**
Contact hours	56 hours	**Preparation for seminars**	14 hours	**Homework**	66 hours
Reading written materials	14 hours	**Midterm test preparation**	0 hours	**Exam preparation**	0 hours

13. Organisational unit in charge	Department of Material Handling and Logistics Systems		
14. Subject coordinator	Bakos András	**15. Email address**	andras.bakos@logisztika.bme.hu
16. …department	Department of Material Handling and Logistics Systems		
17. Lecturers	Bakos András, Bertalan Marcell		

18. Indicative prerequisites	- - -, - - -, - - -

19. Aim of the subject

Introduction into the parts of engineering drawing relevant to logistics engineers, and familiarizing softwares used.

20. Thematics of lectures

-

21. Thematics of practices

-

22. Thematics of laboratories

Practicing basic engineering drawings.Solving 2D and 3D engineering drawing tasks relevant to the logistics field and in later subjects. Practicing general and engineering documentation editing and techniques for presentation through individual tasks. Solving data visualization tasks through examples relevant to the logistics field.

23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)

The student

a) knowledge (t)

1. knows the basics of engineering drawings and its software implementation. (T2, S1)

b) skills (k)

1. uses the known softwares for creating engineering drawings, documentation, presentation and data visualization. (K13, K14, K18, K21, K40, S1)

c) attitude (a)

1. strives to organize and execute visualization tasks precisely during his/her work (A3, A4, A10)
2. interested in new things, has a cooperative attitude towards visualization tasks (A5, A6, A14, A15, A16)

d) autonomy and responsibility (o)

1. independently responsible for visualizing logistics tasks, performing basic organizational and planning tasks (O2, O4, O5, O12, O15)
2. aware of the significance of his work and the consequences of mistakes (O3, O6, O17)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. first task	1. F1	1. 20%	1. t1,k1,a1,a2,o1,o2
2. second task	2. F2	2. 20%	2. t1,k1,a1,a2,o1,o2
3. third task	3. F3	3. 20%	3. t1,k1,a1,a2,o1,o2
4. fourth task	4. F4	4. 20%	4. t1,k1,a1,a2,o1,o2
5. fifth task	5. F5	5. 20%	5. t1,k1,a1,a2,o1,o2

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-

26. Conditions for obtaining signature / midterm grade

At least 50% completion of each task.

27. Final grade in percentage of performance

Excellent 87,5-100%
Good 75-87,5%
Satisfactory 62,5-75%
Pass 50-62,5%
Fail 0-49%

28. Attendance and participation requirements

According to the rules of CoS.

29. Late completion opportunities

The tasks can be retaken once during the semester or the delayed completion period.

30. Consultation opportunities

At a time and in a form agreed with the teacher.

31. Validity of the subject datasheet starts from:

01 September, 2025