MSc training programme	transportation.bme.hu 1/76 olda		ul Version: 08 May, 202		
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering					
1. Subject name	Air Traffic	Control			
2 in Hungarian	Air Traffic Control			3. Programme code	К
4. Subject code				5. Term role	2/1 sp
6. Credits	6	7. Evaluation type	m	8. Form	with contact hours
9. Weekly contact hours	2 lecture	0 practice	2 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 EDUCATION 8	DECENT WORK AND ECONOMIC GROWTH I O AND INFRASTRUK I O AND INFRASTRUK	ATION CTURE 12 RESPONSIBLE CONSUMPTION AND PRODUCTION		
12. Working hours for fulfil	ling the requireme	nts of the subject			180 hours
Contact hours	56 hours	Preparation for seminars	44 hours	Homework	0 hours
Reading written materials	36 hours	Midterm test preparation	44 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Aer	onautics and Naval Arc	hitecture		
14. Subject coordinator	Dr. Rohács Dániel		15. Email address	rohacs.daniel@kjk.bme	e.hu
16department	Department of Aer	onautics and Naval Arc	hitecture		
17. Lecturers	Gál István, Dr. Ro	hács Dániel			
18. Indicative prerequisites					
19. Aim of the subject		· · · · · · · · · · · · · · · · · · ·	T I 'III I I		
airspaces and their elements	, as well as the main	n challenges.	They will have a deta	alled knowledge of AIC t	ypes, tasks,
20. Thematics of lectures					
TRAFFIC DATA - Traffic and SUBSIDIES OF AIR CONTR control (APP). Area control (A BASIC AIRSPACE TYPES A Sectorisation. Special airspace MODERN AIR CONTROL PH functional airspace blocks (F SUPPORT SYSTEMS - Air th conflict detection (STCA and HUMAN ACTIVITIES IN AIR test. Psychological factors. H	statistical data from OL - History of air tr ACC). ND PLACES - Conc ces. ROCEDURES - Lim ABs). Flexible use c raffic controllers' tas MTCA). Proximity v FORCE MANAGEM lealth factors. Huma	n air traffic control. Type raffic control. Elements of cept of airspace. Classif itations of previous proc of airspace (FUA). Free of ks, division of labour. Se varning (MSAW and AP /IENT - Minimum capabi n factors impact.	s of forecasts, foreca of air traffic control. A ication of airspace. E edures. National and use of airspace. HUF eparation. Dangerous W). lities and knowledge	sting methods. irport traffic control (TWF lements of airspace. Hur l European specificities. RA (Hungarian Free Rou s situations. Short and m base. Methods of asses	R). Approach ngarian airspace. Introduction of ute Airspace) edium range sing skills, FEAST
21. Thematics of practices					
- 22. Thematics of laboratori	es				
Demonstration of the lecture topics through site visit.					
23. Subject learning outcor	nes (lowercase let	ters) and their connect	tion to programme	level learning outcome	s (capital letters)
The student					
a) knowledge (t)					
1. knows and understands ai	r traffic control (T10) 	a and ain traffic acuts	-1 (T10)	
 a. is familiar with the controll b) skills (k) 	, processes and sup er selection requirer	port systems of airspace nents, workload and hur	e and air traffic contr man factors and their	measurement (T10)	
1. can easily and quickly acq	uire deeper, more s	pecific knowledge of AT	C activities		
c) attitude (a)	ic, clear and transp	arent documentation			
2. is interested, responsive, r	meets deadlines				
d) autonomy and responsil	bility (o)				

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1. is be able to produce documentation	independently			
2. understands the importance of their w	ork and the consequences of	ferrors		
24. Midterm assessments				
Name	Code	Share in final grade	Assessed learning outcomes	
1. midterm test	1. ZH	1. 100%	1. t1-t3,k1,a1,a2,o1,o2	
25. Exam assessments				
Name	Code	Share in final grade	Assessed learning outcomes	
-	-	-	-	
26. Conditions for obtaining signatur	27. Final grade in percentage of performance			
pass the midterm test with at least 50%	Excellent 80-100%			
28. Attendance and participation requ	uirements		Good 70-79%	
According to the rules of Study and Exa	mination Regulations.		Satisfactory 60-69%	
29. Late completion opportunities	Pass 50-59%			
Repeated replacement of the midterm te	est is available.		Fail 0-49%	
30. Consultation opportunities				
at a time and in a form agreed with the I	ecturers			
31. Validity of the subject datasheet s	starts from:			
01 September, 2025				

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BUDAPEST UNIVERS	SITY OF TECHNOLOG	бу AND ECONOMICS gineering and Veh	icle Engineerin	Subj	ect datasheet
1. Subject name	Air Traffic	Management	(ATM)		
2 in Hungarian	Air Traffic Manage	ement (ATM)		3. Programme code	К
4. Subject code				5. Term role	3/2 sp
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	4 QUALITY EDUCATION	DECENT WORK AND ECONOMIC GROWTH 9 AND INFRASTRUC	ATION 12 RESPONSIBLE CONSUMPTION AND PRODUCTION		
12. Working hours for fulfil	lling the requireme	ents of the subject			90 hours
Contact hours	28 hours	seminars	18 hours	Homework	0 hours
Reading written materials	20 hours	Midterm test preparation	24 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Ae	ronautics and Naval Arcl	nitecture		
14. Subject coordinator	Dr. Rohács Dániel 15. Email address rohacs.daniel@kjk.br				e.hu
16department	Department of Ae	ronautics and Naval Arcl	nitecture		
17. Lecturers	Gál István, Dr. Ro	hács Dániel			
18. Indicative prerequisites	, , 				
19. Aim of the subject					
The student will acquire know ATM services and sub-service	wledge about the ta ces.	sks and structure of ANS	Ps. Within this, the	systems and methods re	quired to provide
20. Thematics of lectures					
ANSP DEFINITION - The rol ATM DEFINITION - History of the air transport system. BASIC UNITS - Air traffic ma Space Management. TODAY'S SYSTEMS - Histor FUTURE GOALS AND DOC Sky projects. FligthPath 2050 DEVELOPED AND ADVANO developments. Launch and s	e of air traffic servic of the development anagement. Internat ry of traffic growth. I UMENTS - Traffic s D. CED SYSTEMS - Se slot management. W	es. Their structure and c of air traffic management ional regulations governi Major traffic nodes and d statistics and forecasts. S eparation and collision av forkload and stress measure	pperation. The main t. The need for air tra- ng traffic. Air Traffic irections. Structure a single European Sky voidance systems. A surement techniques	services. affic management. Air tra Flow Management. Air T and evolution of traffic. programme. SESAR de ugmented reality tools. F s.	affic management in Traffic Control. Air velopments. Clean Remote Tower
21. Thematics of practices					
- 22. Thematics of laboratori	es				
Demonstration of the lecture	topics through site	visit			
23. Subject learning outcom	mes (lowercase let	ters) and their connect	ion to programme	level learning outcome	es (capital letters)
The student a) knowledge (t) 1. knows and understands th 2. knowledge of the system of 3. gain knowledge of the main b) skills (k) 1. can easily and guickly acg	ne basic processes a of traffic manageme in areas of current r juire deeper, more s	and necessities of air tra nt and sub-processes, re esearch and specific res specific knowledge of AT	ffic flow managemer elated methods and earch (T10) M activities	nt (T10) technologies and their ca	apabilities (T10)
c) attitude (a) 1. strives for precise, aesthet	tic, clear and transp	arent documentation			
2. is interested, responsive, r	meets deadlines				
d) autonomy and responsi1. is be able to produce docu	bility (o) umentation independ	dently			

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2. understands the importance of their work and the consequences of errors

24. Midterm assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH	1. 100%	1. t1-t3,k1,a1,a2,o1,o2
25. Exam assessments	· · · · · · · · · · · · · · · · · · ·	·	
Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-
26. Conditions for obtaining signature / midte	27. Final grade in percentage of performance		
pass the midterm test with at least 50% of the m	Excellent 80-100%		
28. Attendance and participation requiremen	Good 70-79%		
According to the rules of Study and Examination	Satisfactory 60-69%		
29. Late completion opportunities			Pass 50-59%
Repeated replacement of the midterm test is available.			Fail 0-49%
30. Consultation opportunities			·
at a time and in a form agreed with the lecturers			
31. Validity of the subject datasheet starts fro	om:		
01 September, 2025			

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BUDAPEST UNIVERS	SITY OF TECHNOLOG	and econo gineering	омісs <mark>and Veh</mark>	icle Engineerin	Subj	ect datasheet
1. Subject name	ATM case	study				
2 in Hungarian	ATM case study				3. Programme code	К
4. Subject code					5. Term role	4/3 sp
6. Credits	3	7. Evaluatio	on type	m	8. Form	with contact hours
9. Weekly contact hours	0 lecture	2 practice		0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 EDUCATION 8	DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVA AND INFRASTRUC	TION 12 RESPONSIBLE CONSUMPTION AND PRODUCTION		
12. Working hours for fulfilling the requirements of the subject						90 hours
Contact hours	28 hours	Preparation seminars	n for	0 hours	Homework	31 hours
Reading written materials	31 hours	Midterm test preparation	t	0 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Aer	ronautics and	Naval Arch	itecture		
14. Subject coordinator	Dr. Rohács Dániel	Dr. Rohács Dániel 15. Email address rohacs.daniel@kjk.b				
16department	Department of Aer	ronautics and	Naval Arch	itecture		
17. Lecturers	Gál István, Dr. Ro	hács Dániel				
18. Indicative prerequisites						
19. Aim of the subject						
Learn about the areas of the	ATM specification t	hrough a prac	ctical projec	t of choice.		
-						
21. Thematics of practices						
During the course, students objective.	must participate in a	n project from	the ATC pr	ojects. Analyzing th	e tasks to be solved for t	he project
22. Thematics of laboratori	es					
-		····	•			· · · · · · · · · · · · · · · · · · ·
23. Subject learning outcol	mes (lowercase let	ters) and the	eir connect	ion to programme	level learning outcome	s (capital letters)
 a) knowledge (t) 1. knows and understands th 2. understand the sources ar b) skills (k) 1. is able to summarise and it 2. is able to use the knowled c) attitude (a) 	e theoretical and pr nd methods of furthe illustrate the activitie ge acquired in the A	actical founda er learning in t es carried out \TM field	ations of the he ATM are in the proje	e ATM field (T10) ea (T10) ct and use the nece	essary IT tools	
1. strives for precise, aesthe	tic, clear and transpa meets deadlines	arent docume	entation			
d) autonomy and responsible. I 1. is be able to produce docu	bility (o)	dently				
2. understands the important	ce of their work and	the conseque	ences of err	ors		
24. Midterm assessments				Share in final		
Name		Со	de	grade	Assessed learning ou	Itcomes
1. creation of accepted proje	ct documentation	1.	PD	1. 100%	1. t1,t2,k1,k2,a1,a2,o1	,02
Name		Co	de	Share in final grade	Assessed learning ou	utcomes

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-	-	-	-
26. Conditions for obtaining sign	ature / midterm grade		27. Final grade in percentage of performance
submission of project documetation			Excellent 80-100%
28. Attendance and participation	Good 70-79%		
According to the rules of Study and	Satisfactory 60-69%		
29. Late completion opportunities		Pass 50-59%	
Repeated replacement of the project		Fail 0-49%	
30. Consultation opportunities			
at a time and in a form agreed with	the lecturers		
31. Validity of the subject datashe	et starts from:		
01 September, 2025			

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BUDAPEST UNIVERS	SITY OF TECHNOLOG	SY AND ECONOMICS gineering and Ve	hicle Engineerin	sub	ject datasheet	
1. Subject name	City logist	ics				
2 in Hungarian	Városi logisztika			3. Programme code	К	
4. Subject code				5. Term role	3/2 sp	
6. Credits	6	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	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 1	1 SUSTAINABLE CITIES 13 CLIMATE 13 ACTION 13 ACTION	17 PARTNERSHIPS FOR THE GOALS			
12. Working hours for fulfil	180 hours					
Contact hours	56 hours	Preparation for seminars	40 hours	Homework	46 hours	
Reading written materials	14 hours	Midterm test preparation	0 hours	Exam preparation	24 hours	
13. Organisational unit in charge	Department of Ma	terial Handling and Log	gistics Systems			
14. Subject coordinator	Dr. Sárdi Dávid La	Dr. Sárdi Dávid Lajos 15. Email address sardi.david@kjk.bme				
16department	Department of Material Handling and Logistics Systems					
17. Lecturers	17. Lecturers Dr. Sárdi Dávid Lajos, Bakos András					
18. Indicative prerequisites						
19. Aim of the subject						
To familiarize students with the basic design methodologies.	he operation and co	ontrol of city logistics sy	stems and related tec	chnologies, as well as the	e application of	
20. Thematics of lectures						
Basics of urban freight transp and logistics parks, certificati logistics developments in Bur Application of urban brownfie city logistics point of view. Ap	oort, basic problems on practice in Hung dapest. City logistic eld areas in city logis oplication of cargo b	Basics of the gateway ary. Development opposite s systems of the conce stics, topological model ikes and drones in city	y concept. Vehicles in ortunities for urban fre ntrated sets of deliver ing of urban areas. M logistics systems for	a city logistics systems. L eight transport. City logist ry locations, modeling in lulti-criteria evaluation of last-mile freight transpor	ogistics services ics in Hungary. City urban logistics. urban zones from a t.	
21. Thematics of practices						
Transportation problem and i solution methods. Vehicle Ro design of transportation conn the Váci utca shopping area.	its solution methods buting Problem (VR nections to logistics	 Centre search and its P) and its solution meth sites. Material handling 	solution methods. Tr ods. Basics of packa solutions, design of i	avelling Salesman Probl ging design. Sizing of cit material handling proces	em (TSP) and its y logistics systems, ses. Fieldwork in	
22. Thematics of laboratori	es					
-						
23. Subject learning outcor	nes (lowercase let	ters) and their conne	ction to programme	level learning outcome	es (capital letters)	
 a) knowledge (t) 1. knowledge of the basics of 2. knowledge of freight transport 3. knowledge of city logistics 4. network planning and network 5. knowledge of solving typic b) skills (k) 1. is able to identify and mod 2. is able to solve city logistic c) attitude (a) 1. strive to maximize their alta accurate and error-free, in cod d) autonomy and responsite 	f city logistics system port technologies in projects (T10) vork evaluation basi al city logistics plan el problems in city l s problems by selec polities to make their pompliance with the r bility (o)	ms (T10) city logistics (T10) ics, knowledge of typica ning problems (T10) ogistics systems cting and applying appr studies at the highest ules of the applicable to	al logistics network me ropriate solution meth possible level, with a pols, in collaboration v	odels (T10) ods and tools/software profound and independe with the instructors	nt knowledge,	

1. take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course

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24. Midterm assessments					
Name		Code	Share in final grade	Assessed learning outcomes	
 first semester task second semester task fieldwork report 		1. HF1 2. HF2 3. TM	1. 17,5% 2. 17,5% 3. 15%	1. t1-t5,k1,k2,a1,o1 2. t1-t5,k1,k2,a1,o1 3. t1-t5,k1,k2,a1,o1	
25. Exam assessments			÷		
Name		Code	Share in final grade	Assessed learning outcomes	
1. written and oral exam		1. V	1. 50%	1. t1-t5,k1,k2,a1,o1	
26. Conditions for obtaining signature / midterm grade				27. Final grade in percentage of performance	
Participation at the city logistics fieldwork, completion of the semester tasks and the fieldwork report at least 50% level.				Excellent 87 5-100%	
28. Attendance and participation	requirements			Good 75-87,5%	
According to the rules of CoS.				Satisfactory 62,5-75%	
29. Late completion opportunitie	S			Pass 50-62,5%	
The semester tasks and the fieldwork report once can be resubmitted by the end of delayed completion week.				Fail 0-50%	
30. Consultation opportunities					
At a time and in a form agreed with	the teacher.				
31. Validity of the subject datash	eet starts from:				
01 September, 2025					

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Communication, navigation and surveillance (CNS) 1. 1. Subject name 2. ... in Hungarian Communications, Navigation and Surveillance (CNS) 1. 3. Programme code κ 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 3 7. Evaluation type m 8. Form hours 9. Weekly contact hours 1 lecture 0 laboratory English 1 practice 10. Language 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 11. SDG Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Contact hours 28 hours 8 hours Homework 8 hours seminars **Reading written Midterm test** 26 hours 20 hours Exam preparation 0 hours materials preparation 13. Organisational unit in Department of Control for Transport and Vehicle Systems charge 15. Email 14. Subject coordinator Dr. Meyer Dóra meyer.dora@kjk.bme.hu address 16. ...department Department of Control for Transport and Vehicle Systems **17. Lecturers** Mudra István, Dr. Meyer Dóra Zsófia - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject The aim of the course is to provide students with a fundamental understanding of navigation principles and to familiarize them with the operation, structure, and maintenance of ground-based and satellite navigation systems. Students will develop the ability to perform navigation-related calculations and apply these systems in practical aviation contexts. 20. Thematics of lectures The basics of navigation. Coordinate systems, map types, calculation of navigation elements (eq direction, wind triangle, fuel consumption, flight time, flight speed), route planning. Theoretical background, structure, data traffic, operation and exercises of navigation systems. Ground systems: non-directional beacons (NDBs) / Automatic direction finder (ADF) GLOBAL NAVIGATION NAVIGATION SYSTEMS (GNSS) PRIMER RADAR AIRCRAFT CONTROL. Using Primary Radars. Characteristics of primary radars. Grouping radars according to their field of application. Antennas (PSR). Transmitter equipment. Receiver equipment. Plot extractor and signal processing. Plot combination. Transmission of data. ROAD RADAR (SMR). Aerodrome use of roller radars. SMR radar sensor. SMR display systems. SECONDARY RADAR SSR and MSSR. Use secondary radars. Antenna. SSR Interogator, Transponder. Customer. Plot extractor and signal processing. Combining Plot. THE S MODE. ADS. ADS-B techniques. S mode extended squitter. ADS-C techniques. MULTILATERATION (MLAT). 21. Thematics of practices Design tasks, maintenance tests, operational tests. 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. understands the fundamental concepts and principles of navigation, including direction determination, types of maps, and navigationrelated calculations (course, wind triangle, fuel consumption, flight time, and speed). (T10) 2. has comprehensive knowledge of the structure, operation, and data communication of ground-based, terrestrial, and global satellite navigation systems (NDB/ADF, DF, VOR, DME, ILS, MLS, GNSS, radars, ADS, MLAT). (T10) 3. is familiar with the maintenance and inspection procedures of navigation systems and their practical applications in aviation. (T10) b) skills (k) 1. is able to independently perform route planning and navigation calculations (e.g., wind triangle, flight time, fuel consumption). 2. is capable of interpreting the operation of navigation systems, identifying malfunctions, and analyzing system performance characteristics.

3. is able to select and apply appropriate navigation systems (e.g., NDB, VOR, DME, ILS, GNSS) for different flight environments.

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c) attitude (a)				
1. demonstrates a commitment to ac	curacy, reliability, an	d adherence	to standards in the a	pplication and management of navigation
systems.				
d) autonomy and responsibility (o)	· · · · · · · · · · · · · · · · · · ·			
capable of making independent decis	sions related to these	alion data and e tasks.	i the proper operation	i of the applied havigation systems, and is
24. Midterm assessments				
Name		Code	Share in final grade	Assessed learning outcomes
1. midterm test		1. ZH	1.85%	1. t1,t2,t3,k1,k2,k3
2. homework		2. HF	2. 15%	2. t1,t2,t3,k1,k2,k3,a1,o1
25. Exam assessments				
Name		Code	Share in final grade	Assessed learning outcomes
-		-	-	-
26. Conditions for obtaining signation	ture / midterm grad	е		27. Final grade in percentage of performance
Passing the midterm test and the hor	nework with at least	satisfactory r	narks.	Excellent 88-100%
28. Attendance and participation requirements				Good 75-87%
according to the rules of CoS				Satisfactory 63-74%
29. Late completion opportunities				Pass 50-62%
Second retake or delayed completion of one of the obligations is possible.				
30. Consultation opportunities				
At a time and in a manner agreed up	on with the instructor	r		
31. Validity of the subject datashee	et starts from:			
01 September, 2025				

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Communication, navigation and surveillance (CNS) 2. 1. Subject name 2. ... in Hungarian Communications, Navigation and Surveillance (CNS) 2. 3. Programme code κ 4. Subject code 5. Term role 3/2 | sp with contact 6. Credits 3 7. Evaluation type е 8. Form hours 9. Weekly contact hours 1 lecture 0 laboratory 10. Language English 1 practice 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education **9** INDUSTRY, INNOVATION AND INFRASTRUCTURE 11. SDG 4 Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Contact hours 28 hours 18 hours Homework 0 hours seminars **Midterm test Reading written Exam preparation** 15 hours 15 hours 14 hours materials preparation 13. Organisational unit in Department of Aeronautics and Naval Architecture charge 15. Email 14. Subject coordinator Dr. Rohács Dániel rohacs.daniel@kjk.bme.hu address 16. ...department Department of Aeronautics and Naval Architecture **17. Lecturers** Gál István, Dr. Rohács Dániel Communications, Navigation and Surveillance (CNS) 1. (strong), **18. Indicative** - - -, prerequisites - - -**19. Aim of the subject** The student will acquire knowledge of the communication, surveillance and data processing systems used in air traffic, input and output requirements, and operating principles. 20. Thematics of lectures Communication (COM): an introduction to voice communication. Air-ground communications (knowledge of air-ground communication elements on the CWP HMI, purpose and function of each element, future developments, CPDLC). Ground-ground communications (ground-ground communication elements on the CWP HMI, function of the communication centre in use, MFC, ATS Qsig, VoIP, future developments). Data communications (basics of data communications, flight specific networks and protocols, OLDI-FMTP, AFTN-AMHS, PENS). Data Processing (DAT): Introduction to data processing. Introduction to data processing. Introduction to FDP and SDP. SDP basic principles (plot processing, track training (single/multi track). FDP tasks (flight plan data update, code/callsign correlation). FDP (IFPS, route processing, code/callsign comparison, code assignment, track tagging). Different visualisation technologies. Airspace Surveillance (SUR): Theory and practice of multilateration (LAM, WAM). 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) 1. can list CNS communication systems (T10) 2. is able to describe the basic principles of CNS systems (T10) 3. knows the practical application of CNS communication systems (T10) b) skills (k) 1. can distinguish between air to ground and ground to ground systems 2. can even carry out market research based on their knowledge c) attitude (a) 1. strives for precise, aesthetic, clear and transparent documentation 2. is interested, responsive, meeting deadlines d) autonomy and responsibility (o) 1. is able to produce documentation independently 2. understand the importance of their work and the consequences of errors

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3. develops safety awareness			
24. Midterm assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH	1.0%	1. t1-t3,k1,k2,a1,a2,o1-o3
25. Exam assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. oral exam	1. V	1. 100%	1. t1-t3,k1,k2,a1,a2,o1-o3
26. Conditions for obtaining signat	27. Final grade in percentage of performance		
pass the final examination with at least	st 50% of the marks		Excellent 88-100%
28. Attendance and participation re	equirements		Good 75-87%
According to the rules of Study and E	xamination Regulations.		Satisfactory 63-74%
29. Late completion opportunities	Pass 50-62%		
Repeated replacement of the midtern	n test is available.		Fail 0-49%
30. Consultation opportunities			
at a time and in a form agreed with th	e lecturers		
31. Validity of the subject datashee	et starts from:		
01 September, 2025			

transportation.bme.hu BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering **Decision making methods** 1. Subject name 2. ... in Hungarian Döntéselőkészítő matematikai módszerek 3. Programme code κ 4. Subject code 5. Term role 1/2 | k with contact 6. Credits 6 7. Evaluation type m 8. Form hours English 9. Weekly contact hours 3 lecture 1 practice 0 laboratory 10. Language **9** INDUSTRY, INNOVATION 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education 11. SDG 4 AND INFRASTRUCTURE MPTION Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for Contact hours** 56 hours 34 hours Homework 0 hours seminars **Reading written Midterm test** 74 hours 16 hours Exam preparation 0 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Sipos Tibor sipos.tibor@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Sipos Tibor, Dr. Szabó Zsombor - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject The aim of the course is to provide students with comprehensive knowledge of mathematical modeling techniques, with a special focus on optimization methods applied in transportation. Students will learn the fundamentals of linear programming, including the simplex method and the practical use of primal-dual relationships. The course emphasizes solving typical transportation-related problems such as transportation and assignment models, as well as integer programming tasks. Students will explore network modeling and solution techniques for problems like maximum flow, minimum cost, shortest path, and critical path, and will learn to apply complex network planning methods. Additionally, the course covers the basics of integer programming, the branch-and-bound method, and solution approaches to classic combinatorial problems such as the knapsack problem and the traveling salesman problem. 20. Thematics of lectures Principles of mathematical modeling. Solving linear programming problems using the simplex methods. Application of primal-dual methods in the decision process. Programming methods applied frequently in the transportation: transportation, assignment models, integer programming methods. Network problems and methods: maximum flow, minimum-cost flow problem, shortest path problem, critical path method. Dynamic programming. Principles of nonlinear programming, game theory, stochastic processes. Queuing models and their application in the transportation. Stocking problems. Markov chains and their application in transportation. Forecasting. Simulation. MultiCriteria Analysis. 21. Thematics of practices Solving linear programming and other problems using computers, developing and solving simplified real life case studies. 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. Understands the mathematical foundations of linear programming problems and their applicability in modeling transport-related issues. (T1,T8) 2. Recognizes the types of network problems and solution methods, such as maximum flow and shortest path algorithms. (T1) 3. Knows the theoretical basis of special optimization models used in transportation (transportation, assignment, integer programming models). (T1,T8) b) skills (k) 1. Able to solve linear programming problems using the simplex method. (K1) 2. Can model and solve network problems common in transportation. (K1,K2,K4) Able to identify and apply dynamic and integer programming methods in transport contexts. (K2,K4,K11) 4. Participates in research or development tasks related to transport modeling. (K5,K14)

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5. Communicates and publishes mod	eling results using pro	ofessional l	anguage. (K13)		
c) attitude (a)					
1. Shows interest in applying new ma	thematical methods a	nd modelir	ng techniques in trans	portation. (A1)	
2. Embraces the ethical and scientific	values associated wi	th the disci	pline. (A2)		
3. Strives to apply complex, systems-	based thinking in moo	deling and	decision-making situa	tions. (A7)	
d) autonomy and responsibility (o)					
1. Independently selects and applies	the most appropriate	mathemati	cal modeling method f	or a given problem.	(01)
2. Takes responsibility for the correct	ness and consequenc	es of mode	eling decisions. (O1)		
3. Develops independent proposals fo	or solving complex tra	nsport prot	plems using modeling	tools. (01)	
24. Midterm assessments					
Name		Code	Share in final grade	Assessed learn	ing outcomes
1. midterm test		1. ZH1	1. 50%	1. t1,t2,k1,k2,k3,	k4,k5,a1,a2,a3,o1,o2,o3
2. midterm test		2. ZH2	2. 50%	2. t3,k1,k2,k3,k4,	k5,a1,a2,a3,o1,o2,o3
25. Exam assessments					
Name		Code	Share in final grade	Assessed learn	ing outcomes
-		-	-	-	
26. Conditions for obtaining signat	ure / midterm grade			27. Final grade i performance	n percentage of
successful (min. 50%) completion of t	he midterm tests			Excellent 85-100	%
28. Attendance and participation re	quirements			Good 70-85%	,0
according to the rules of CoS				Satisfactory 55-7	0%
29. Late completion opportunities				Pass 40-55%	
The midterms can be retaken accordi	ng to the Code of Stu	dies.		Fall 0-49%	
30. Consultation opportunities					
at a time and in a form agreed with th	e teacher				
31. Validity of the subject datashee	t starts from:				
01 September, 2025					

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BUDAPEST UNIVERS	sity of technolo nsportation Er	gy and economics agineering and Ve	hicle Engineeri	ng Subj	ect datasheet	
1. Subject name	Electromo	obility				
2 in Hungarian	Elektromobilitás			3. Programme code	К	
4. Subject code				5. Term role	2/1 sp	
6. Credits	3	7. Evaluation type	m	8. Form	with contact hours	
9. Weekly contact hours	1 lecture	1 practice	0 laboratory	10. Language	English	
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 1	1 SUSTAINABLE CITIES AND COMMUNITIES 13 ACTION 13 ACTION	17 PARTNERSHIPS FOR THE GOALS		90 hours	
		Preparation for			30 110015	
Contact hours	28 hours	seminars	6 hours	Homework	35 hours	
Reading written materials	6 hours	Midterm test preparation	15 hours	Exam preparation	0 hours	
13. Organisational unit in charge	Department of Transport Technology and Economics					
14. Subject coordinator	Dr. Csonka Bálint	t	csonka.balint@kjk.bm	e.hu		
16department	Department of Tr	ansport Technology and	I Economics			
17. Lecturers	Dr. Csonka Bálin	t, Dr. Földes Dávid				
 18. Indicative prerequisites 19. Aim of the subject Understanding the compone analytical and design methometary 	nts, characteristics	, functioning, relationshi applications for the plar	ps, trends and challe	enges of the electromobilit of electromobility services	ry system. Learn s through best	
practices and the semester-i	long design assignr	nent.				
Electromobility system; Elect	trification of urban t	ous networks; Vehicle ar	nd battery technolog	y; Charging infrastructure	and charging	
management; Economic and	a environmental imp	bacts; Hydrogen-based e	electromobility.			
As part of the practice, stude presented in 10-15 minutes I routes based on operational bus terminals and design of services: turn planning, char	ents will be given a s by the students. The characteristics; Lin charging infrastruct ging management.	semester-long design as e practice and the assig ear programming in Mat ure; Modelling of bus ne	ssignment to solve in nment are based or lab: objective function twork and design of	ndividually or in groups. Th the following topics: Clus ons, criteria, algorithms; E f trolleybus network; Optin	ne results must be ster analysis of bus nergy modelling of hisation of bus	
	169					
23. Subject learning outco	mes (lowercase le	tters) and their connec	ction to programm	e level learning outcome	s (capital letters)	
 a) knowledge (t) 1. Knows and understands the integration into the transport 2. Knows the tools and meth 3. Knows and understands the b) skills (k) 1. Able to process and organ further develop services 2. Able to solve problems created or integration of the service systems at the service system service system service systems at the service system service system service systems at the service system service system service system service service systems at the service system service ser	he specific methods system (T10) ods related to linea he methodology an nise information coll eatively and solve c of electromobility se a high level	s, technologies, and app ir programming modellin d tools for the design an lected on electromobility complex problems flexibl ervices, to develop an ev	lications of electrom g for electric bus se d research of electr , analyse it, draw co y in the field of elect valuation and a prop	nobility systems and solution ervices and charging mana omobility services onclusions and explore the tromobility, based on a system posal, to develop, plan, org	ons for the gement connections and stems and process- ganise and manage	
c) attitude (a)1. Open and receptive to tec	hnological develop	ment and innovation in a	alactromobility and	a cradible presentar in the	tonia	

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3. Strives to carry out his/her work based on a systems and process-oriented mindset, in a complex approach, taking into account sustainability and economic aspects.						
4. 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.						
d) autonomy and responsibility (o)	d) autonomy and responsibility (o)					
1. In addition to narrow professional cri errors independently, while taking into	1. In addition to narrow professional criteria, ensures sustainability in the use of his/her knowledge, is able to self-monitor and correct errors independently, while taking into account the professional opinion of others					
2. Makes responsible decisions in anal solve identified challenges	ysis, planning and	operation o	f electromobility servic	es, and formulates ir	ndependent proposals to	
24. Midterm assessments						
Name		Code	Share in final grade	Assessed learni	ng outcomes	
1. midterm test		1. ZH	1. 50%	1. t1,t2,t3,k1,k3,a	1,a3,a4,o1,o2,	
2. urban bus service electrification assi	gnment	2. HF	2. 50%	2. t1,t2,t3,k1,k2,k	3,a1,a2,a3,a4,o2	
25. Exam assessments						
Name		Code	Share in final grade	Assessed learni	ng outcomes	
-		-	-	-		
26. Conditions for obtaining signature / midterm grade				27. Final grade i performance	n percentage of	
submission and presentation of task on time and successful (min. 50%) completion of the midterm test Excellent 88-100%					%	
28. Attendance and participation req	uirements			Good 75-87%		
according to the rules of CoS	-			Satisfactory 63-7	4%	
29. Late completion opportunities				Pass 50-62%		
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						

MSc training programme	transport	ation.bme.hu	1/76 olda	al Vo	ersion: 08 May, 2025	
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering						
1. Subject name	Environm	ental effects o	of transport			
2 in Hungarian	Közlekedés körny	ezeti hatásai		3. Programme code	К	
4. Subject code				5. Term role	4/3 sp	
6. Credits	6	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	7 AFFORDABLE AND CLEAN ENERGY CLEAN ENERGY 9	INDUSTRY, INNOVATION AND INFRASTRUCTURE 11 SUSTAINABLE	Ites 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE		
12. Working hours for fulfil	ling the requireme	nts of the subject			180 hours	
Contact hours	56 hours	Preparation for seminars	13 hours	Homework	30 hours	
Reading written materials	71 hours	Midterm test preparation	10 hours	Exam preparation	0 hours	
13. Organisational unit in charge	Department of Tra	insport Technology and	Economics			
14. Subject coordinator	Dr. Török Ádám		15. Email address	torok.adam@kjk.bme.	hu	
16department	Department of Tra	insport Technology and	Economics			
17. Lecturers	Dr. Török Ádám					
18. Indicative prerequisites	8. Indicative					
19. Aim of the subject						
The aim of the course is to provide students with a comprehensive understanding of the environmental impacts of transportation and the tools and strategies available for developing sustainable transport systems. The course explores the interactions between transportation and the environment, the challenges of sustainability, and the regulatory frameworks, policies, trends, and best practices aimed at mitigating environmental impacts. It covers the role of Environmental Impact Assessments (EIA) in transportation decision-making, the integration of transport and land-use planning, and environmental conflicts in freight transport. Special emphasis is placed on intermodality, sustainable urban mobility, and cost internalization of transport externalities. Students will gain insight into pricing mechanisms such as parking and usage fees, as well as environmentally friendly propulsion technologies, alternative fuels, and energy-efficient vehicles.						
20. Thematics of lectures						
Transport- environment, factors of environmental impact, the problem of sustainability. Mitigation of environmental impacts of transport, regulations, policies, tendencies, practices. Local and international case studies. EIA, decision making, preparation of decisions on the field of transport infrastructure development. Integration of transport and land use policies. Environmental conflicts of freight transport, intermodality and transit policies. Environmental costs of transport, the case of externalities, prices and charges. Urban transport, opportunities of sustainable urban environmental management, integration of environmentally sound mobility forms. Sustainable Urban Mobility Plans. Demand management, parking and road charges. Requirements of fuel efficiency, alternative fuels, energy efficient and environmentally enhanced vehicles.						
21. Thematics of practices						
Internal and external discuss environmental impact, referri	Internal and external discussions, consulations with experts and representatives of firms, institurions dealing with transport environmental impact, referring to certain elements of the curricula.					
22. Thematics of laboratori	es					
-						
23. Subject learning outcom	mes (lowercase let	ters) and their connec	tion to programme	level learning outcome	es (capital letters)	
The student a) knowledge (t) 1. Knows and understands the mitigation through regulation	ne environmental im s and technology.	pact factors of transpor	t, including physical	and health effects, and th	ne methods for their	
2. Recognizes the three pilla	rs of sustainability (environmental, econom	ic, social) and their t	ransport-related aspects	and criteria.	

Recognizes the three plilars of sustainability (environmental, economic, social) and their transport-related aspects and chiena.
 Describes the steps of Environmental Impact Assessment (EIA) related to transport infrastructure development and the basics of

a. Describes the steps of Environmental impact Assessment (EIA) related to transport infrastructure development and the basics of national and international regulations.

4. Knows the methods and regulatory tools for internalizing and charging for the external costs of transport.

5. Understands the technical and regulatory characteristics of sustainable propulsion systems and alternative fuels.

b) skills (k)

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1. Applies the principles of sustain teams.	able transport planning when desig	ning or upgrading tran	sport systems, both individually and in			
2. Analyzes and evaluates the environmental impacts of transport systems and proposes reduction strategies.						
 Designs and manages the environmentally conscious operation of transport systems, considering the protection of the natural, built, and social environment. 						
4. Applies and further develops en	vironmental planning and regulator	y methods within the tr	ansport sector.			
c) attitude (a)						
1. Strives to reduce the environme	ental burdens of transport and is ope	en to exploring and ap	olying innovative, sustainable solutions.			
2. Accepts and advocates for the p communication.	principle of prevention in addressing	g environmental challer	nges in transport and promotes related			
3. Values minimizing environmenta	al impacts in both the development	and operation of trans	port infrastructure.			
d) autonomy and responsibility	(0)					
1. Takes responsibility for enforcin operation.	g environmental and sustainability	principles in transport e	engineering development, research, and			
2. Formulates independent propos	als for the implementation and imp	rovement of sustainabi	ility-focused transport solutions.			
3. Recognizes the long-term environ accordingly.	onmental consequences of transpo	rt decisions and is cap	able of making responsible decisions			
24. Midterm assessments						
Name	Code	Share in final grade	Assessed learning outcomes			
 midterm test independent research assignment 	1. ZH 2. F	1. 50% 2. 50%	1. t1,t2,t3,t4,t5,k2,k4 2. k1,k2,k3,k4,a1,a2,a3,o1,o2,o3			
25. Exam assessments	· · · · · · · · · · · · · · · · · · ·	·				
Name	Code	Share in final grade	Assessed learning outcomes			
-	-	-	-			
26. Conditions for obtaining sig	nature / midterm grade		27. Final grade in percentage of performance			
submission and presentation of tas midterm test	submission and presentation of task on time and successful (min. 50%) completion of the midterm test					
28. Attendance and participation	n requirements		Good 75-87%			
according to the rules of CoS			Satisfactory 63-74%			
29. Late completion opportunitie	es		Pass 50-62%			
Delayed submission and presenta acceptable written tests, during the	Fail 0-49%					
30. Consultation opportunities						
at a time and in a form agreed with	n the teacher					
31. Validity of the subject datasheet starts from:						
01 September, 2025						

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Financial techniques in transportation 1. Subject name 2. ... in Hungarian Finanszírozási technikák a közlekedésben 3. Programme code κ 4. Subject code 5. Term role 3/2 | sp with contact 6. Credits 6 7. Evaluation type е 8. Form hours 2 lecture 2 laboratory 9. Weekly contact hours 10. Language English 0 practice 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education 11. SDG 4 Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for** Contact hours 56 hours 15 hours Homework 35 hours seminars **Midterm test Reading written Exam preparation** 19 hours 30 hours 25 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Kővári Botond kovari.botond@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Kővári Botond - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject Acquiring knowledge about financing investments and their return. 20. Thematics of lectures Concepts of financing: financing goals (development, operation); financing options: budget, private or public-private partnerships (PPP); loan, bond, lease and their characteristics. Significance of the PPP trabsport projects. Project analysis and evaluation methods. Project identification, technical preparation, traffic forecast and modeling. Risk assessment needs. Feasibility studies, cost-benefit analysis, financial, social, legal, regulatory and technical compliance criterias. The identification of project risks. Definition of government, regional and local priorities. The role of the partners in the project financing. Communication tasks. The media's role for accepting the project financing methods by the society. Optimizing fees and tariffs. Financial structures and models. Contracts. 21. Thematics of practices 22. Thematics of laboratories Computer labs for making modell calculations to illustrate and practice the details of project finance, and for analyzing case studies. 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 economic and financial processes of projects necessary for the implementation of developments in the field of transport, transportation and logistics (T10) 2. understands the operation of PPP-type investments (T10) 3. knows the purpose and structure of cost-benefit analyses (T10) 4. knows the process of project evaluation and risk analysis (T10) b) skills (k) 1. evaluates the economic and financial efficiency of projects 2. analyzes the efficiency of investments 3. analyzes the risks arising during the investment c) attitude (a) 1. strives to the best of his/her abilities to solve complex economic tasks 2. strives to solve complex problems in his/her work, always taking into account multiple aspects

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

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2. feels responsible for the results and quality of his work

24. Midterm assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. midterm test	1. ZH	1. 25%	1. t1,t2,t3,t4,k1,k2,k3,o1		
2. homework paper	2. F1	2. 50%	2. t1,t2,t3,t4,k1,k2,k3,a1,a2,o2		
25. Exam assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. oral exam	1. V	1. 25%	1. t1,t2,t3,t4,k1,k2,k3,a1,o2		
26. Conditions for obtaining signature / midterm grad	27. Final grade in percentage of performance				
submission and presentation of task on time and success midterm test	Excellent 88-100%				
28. Attendance and participation requirements			Good 75-87%		
according to the rules of CoS		Satisfactory 63-74%			
29. Late completion opportunities		Fail 0-49%			
second retake or delayed completion is only from one mid	nent				
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					

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering			ng Subj	ject datasheet		
1. Subject name	Freight for	rwarding man	agement 1.			
2 in Hungarian	Szállítmányozási	menedzsment 1.		3. Programme code	KL	
4. Subject code				5. Term role	2/1 sp	
6. Credits	6	7. Evaluation type	е	8. Form	with contact hours	
9. Weekly contact hours	2 lecture	0 practice	2 laboratory	10. Language	English	
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	8 DECENT WORK AND ECONOMIC GROWTH	NDUSTRY, INNOVATION AND INFRASTRUCTURE 12 RESPONSIBLE CONSUMPTIO AND PRODUC CONSUMPTIO				
12. Working hours for fulfi	lling the requireme	ents of the subject			180 hours	
Contact hours	56 hours	Preparation for seminars	8 hours	Homework	32 hours	
Reading written materials	34 hours	Midterm test preparation	30 hours	Exam preparation	20 hours	
13. Organisational unit in	Department of Tra	ansport Technology and	Economics			
14. Subject coordinator	Dr. Mészáros Fere	enc	15. Email address	meszaros.ferenc@kjk.	bme.hu	
16department	Department of Tra	ansport Technology and	Economics			
17. Lecturers	Dr. Duleba Szabo	lcs, Dr. Mészáros Feren	c			
18. Indicative prerequisites	18. Indicative prerequisites					
19. Aim of the subject						
The aim of the course is to in the tariff, customs and insura	ntroduce the freight ance processes rela	transport field, to familian ted to the freight transpo	rise students with th ort.	e basic concepts and rule	es, and to explore	
20. Thematics of lectures						
General knowledge of freigh forwarding. Special tasks of items, weekend traffic restric contracting. Forwarding pari	t forwarding: evoluti dangerous goods, p ctions. Customs and ties. Insurances use	on, position and market erishable goods, live an customs procedures, ap d in freight forwarding.	of freight forwarding imals, plant products oplication rules. Proc	. Fundamentals. Contrac s. Forwarding of overweig duct protection. Pricing m	t of carriage and ghted and oversized lethods in	
21. Thematics of practices	i					
-						
22. Thematics of laborator	ies					
Students process, investigat	e, and critically eval	uate individual case stud	ly reports on current	t freight forwarding topics	S	
23. Subject learning outco	mes (lowercase let	ters) and their connect	tion to programme	level learning outcome	es (capital letters)	
The student a) knowledge (t) 1. know the basic concepts and legal framework of national and international freight transport and freight forwarding (L:T2,T6,T8,T9) 2. recognise the differences in the organisation and performance of general and special transit tasks (K:T10;L:T2,T9)						
4. understand terms related to customs and insurance (L:T2,T8,T9)						
b) skills (k)						
1. apply and implement legislation concerning freight transport and freight forwarding (L:K10)						
3. consider and select the pa	arities to be used for	the transport operation	(L:K4,K7,K13)			
 4. analyses and calculates the customs duty payable in the system of the consignor/consignee relationship and proposes ways of optimising the associated costs (L:K1,K2,K4,K7,K13) c) attitude (a) 						
1. strives for completeness i towards members of his/her	n the acquisition of I team (L:A2,A4,A5,A	knowledge, cooperates v \7,A8,A9,A10)	vith the teacher and	fellow students, is empa	thetic and tolerant	
 2. is open to new and innovative ideas and research, is self-critical of the tasks assigned to him/her, and takes full responsibility for sustainability (L:A1,A3,A6) d) autonomy and responsibility (o) 						
,	- J \ - 1					

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1. in addition to the narrow professional aspects, ensures sustainability aspects in the use of his/her knowledge, is able to self-check and correct errors independently by listening to the professional opinion of others (L:O3,O4)

2. makes responsible decisions in the field of transport management in response to open questions and formulates independent proposals to solve identified challenges (L:O1,O2,O5)

24. Midterm assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. midterm test	1. ZH1	1. 20%	1. t1,t2,k1		
2. midterm test	2. ZH2	2. 20%	2. t3,t4,k2,k3,k4		
3. case study	3. ET	3. 20%	3. k2,k3,k4,a1,a2,o1,o2		
25. Exam assessments					
Nama	Code	Share in final	Accord loorning outcomes		
Name	Code	grade	Assessed learning outcomes		
1. oral exam	1. V	1. 40%	1. t1,t2,t3,t4,k1,k2,k3,k4,a1,a2,o1,o2		
26. Conditions for obtaining signature / midterm gra	27. Final grade in percentage of performance				
successful completion (min. 50%) of each of the two min presentation of the individual case study by the deadline	Excellent 88-100%				
28. Attendance and participation requirements			Good 75-87%		
according to the rules of CoS		Satisfactory 63-74%			
29. Late completion opportunities		Pass 50-62%			
second retake or delayed completion is only from one m					
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					

MSc training programme	transport	ation.bme.hu	1/76 olda	l V	Version: 08 May, 2025	
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering						
1. Subject name	Freight for	rwarding man	agement 2.			
2 in Hungarian	Szállítmányozási i	menedzsment 2.		3. Programme code	KL	
4. Subject code				5. Term role	2/1 sp	
6. Credits	6	7. Evaluation type	е	8. Form	with contact hours	
9. Weekly contact hours	2 lecture	0 practice	2 laboratory	10. Language	English	
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	8 DECENT WORK AND ECONOMIC GROWTH	INDUSTRY, INNOVATION AND INFRASTRUCTURE 12 RESPONSIBLE CONSUMPTIO AND PRODUC				
12. Working hours for fulfi	lling the requireme	nts of the subject			180 hours	
Contact hours	56 hours	Preparation for seminars	8 hours	Homework	32 hours	
Reading written materials	34 hours	Midterm test preparation	30 hours	Exam preparation	20 hours	
13. Organisational unit in charge	Department of Tra	nsport Technology and	Economics			
14. Subject coordinator	Dr. Mészáros Fere	enc	15. Email address	meszaros.ferenc@kjk	.bme.hu	
16department	Department of Tra	insport Technology and	Economics			
17. Lecturers	Dr. Duleba Szabo	lcs, Dr. Mészáros Feren	2			
18. Indicative prerequisites Freight forwarding management 1. (co-requisite),						
19 Aim of the subject						
The aim of the course is to p chains, to introduce the basi intermodal, and groupage tra	provide a sub-sector c concepts and rules ansport.	specific introduction to t s of the sub-sector and to	ne freight transport s c explore the chargi	sector, to describe the in ng processes related to s	termodal transport sub-sectorial,	
20. Thematics of lectures Mode-specific knowledge of freight forwarding. International and domestic conventions / rules, technology and pricing of freight haulage and forwarding on road. International and domestic conventions / rules, technology and pricing of freight haulage and forwarding on rail. International and domestic conventions / rules, technology and tariffs of freight haulage and forwarding for inland waterway transports. International and domestic conventions / rules, technology and pricing of freight haulage and forwarding of maritime transport and shipping. International and domestic conventions / rules, technology and pricing of freight haulage and forwarding for air transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports. International and domestic conventions / rules, technology and pricing for combined freight transports.						
21. Thematics of practices						
- 22. Thematics of laborator	ies					
Students process, investigate, and critically evaluate individual case study reports on current freight forwarding topics according to their our expert interacted						
23. Subject learning outco	mes (lowercase let	ters) and their connect	ion to programme	level learning outcome	es (capital letters)	
The student						
 a) knowledge (t) 1. know the basic concepts a 2. as a mode of transport, re(K:T10;L:T2,T9) 3. knows the concepts relate 4. understands terms and op b) skills (k) 1. apply and implement the I 2. plan and calculate the frei 	and legal framework cognises the differe ed to mode-specific t perational rules relat egislation concernin ght charges to be le	of national and internati nces in the organisation ariffs and parities (L:T2, ed to the areas of interm g the sub-sector-specific vied according to the mo	onal freight transpor and performance of T6,T9) odal transport chain treight transport an ode (L:K1.K11.K13)	t and freight forwarding general and special trar is and groupage (L:T2,Ta id forwarding tasks (L:K1	(L:T2,T6,T8,T9) nsit tasks 8,T9) 0)	
 3. considers and selects the 4. propose a transport chain c) attitude (a) 	parcels and modes design and optimise	of transport to be used f the related costs (L:K1	or the transport ope K2,K4,K7,K13)	ration (L:K4,K7,K13)		

1. strives for completeness in the acquisition of knowledg towards members of his/her team (L:A2,A4,A5,A7,A8,A9,	e, cooperate A10)	s with the teacher and	fellow students, is empathetic and tolerant		
2. is open to new and innovative ideas and research, is self-critical of the tasks assigned to him/her, and takes full responsibility for sustainability (L:A1,A3,A6)					
d) autonomy and responsibility (o)					
1. in addition to the narrow professional aspects, ensures correct errors independently by listening to the profession	sustainabilit al opinion of	y aspects in the use of others (L:O3,O4)	f his/her knowledge, is able to self-check and		
2. makes responsible decisions in the field of transport maproposals to solve identified challenges (L:O1,O2,O5)	anagement i	n response to open qu	estions and formulates independent		
24. Midterm assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. midterm test	1. ZH1	1. 20%	1. t1,t2,t3,k1,k2,k3,k4		
2. midterm test	2. ZH2	2. 20%	2. t2,t3,t4,k1,k2,k3,k4		
25 Exam assessments	J. E I	3. 2070	5. KZ,K3,K4,a1,a2,01,02		
		Share in final			
Name	Code	grade	Assessed learning outcomes		
1. oral exam	1. V	1. 40%	1. t1,t2,t3,t4,k1,k2,k3,k4,a1,a2,o1,o2		
26. Conditions for obtaining signature / midterm grad	е		27. Final grade in percentage of performance		
successful completion (min. 50%) of each of the two midt presentation of the individual case study by the deadline	erm test and	the submission and	Excellent 88-100%		
28. Attendance and participation requirements			Good 75-87%		
according to the rules of CoS			Satisfactory 63-74%		
29. Late completion opportunities			Fail 0-49%		
second retake or delayed completion is only from one mid	dterm require	ement			
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					

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MSc training programme

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BUDAPEST UNIVERS	SITY OF TECHNOLOG	SY AND ECON gineering	юміся and Vel	nicle Engineeri	ng	ject datasheet
1. Subject name	Freight for	wardin	g mar	keting		
2 in Hungarian	Szállítmányozási r	narketing			3. Programme code	KL
4. Subject code					5. Term role	3/2 sp
6. Credits	3	7. Evaluati	on 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	4 QUALITY 8	ECENT WORK AND ECONOMIC GROWTH	12 RESPONSIBIL CONSUMPTI AND PRODU			
12. Working hours for fulfil	ling the requireme	nts of the su	ubject			90 hours
Contact hours	28 hours	Preparatio seminars	on for	10 hours	Homework	25 hours
Reading written materials	12 hours	Midterm tes preparation	st .	15 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Tra	nsport Techr	nology and	Economics		
14. Subject coordinator	Dr. Kővári Botond			15. Email address	kovari.botond@kjk.br	ie.hu
16department	Department of Tra	nsport Techr	nology and	Economics		
17. Lecturers	Dr. Kővári Botond					
18. Indicative prerequisites	18. Indicative prerequisites					
19. Aim of the subject						
To familiarize students with n	narket processes ar	nd customer l	habits.			
20. Thematics of lectures						
Marketing definition, specialize the company in the view of me Product life cycle. Analyzing	zed areas in transpo narketing. Market res the resources. Servi	ortation. Rela search metho ice marketing	tion betwe ods, consu g.	en product-market, mer market types. (price-quality. Sales functi Competition and target ma	on and benefit of arket analysis.
21. Thematics of practices			-			
-						
22. Thematics of laboratori	es					
Market and product analysis.	Case studies about	t market posi	ition. Calcu	llations about produ	ict mix analysis of a comp	any.
23. Subject learning outcor	nes (lowercase let	ters) and the	eir connec	tion to programm	e level learning outcome	es (capital letters)
The student a) knowledge (t) 1. knows the structure and tasks of the marketing strategy of companies (K:T10;L:T9) 2. knows the methods of product mix analysis (K:T10;L:T9) 3. knows the methods of market analysis (K:T10;L:T9)						
 b) skills (k) 1. evaluates the functioning of the market (L:K1) 2. evaluates and manages the portfolio of companies (L:K1,K9,K10,K11) c) attitude (a) 1. strives to the best of his/her abilities to solve complex economic tasks (L:A1,A2,A4,A5,A7) 2. strives to solve complex problems in his/her work, always taking into account multiple aspects (L:A3,A6,A8,A9,A10) 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 (L:O1,O2,O5) 2. feels responsible for the results and quality of his work (L:O3,O4) 						
24. Midterm assessments						
Name		Co	ode	Share in final grade	Assessed learning o	utcomes
1. midterm test 2. homework paper		1. 2.	ZH F1	1. 50% 2. 50%	1. t1,t2,t3,k1,k2,o1 2. t1,t2,t3,k1,k2,a1,a2	,02

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Name	Code	Share in final grade	Assessed learning outcomes
-	-	-	-
26. Conditions for obtaining signature / midterm gra	27. Final grade in percentage of performance		
successful (min. 50%) completion of the midterm test ar paper	Excellent 88-100%		
28. Attendance and participation requirements	Good 75-87%		
according to the rules of CoS	Satisfactory 63-74%		
29. Late completion opportunities	Fail 0-49%		
second retake or delayed completion is only from one m	nidterm requi	rement	
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			

homework paper

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Human resource management in transportation 1. Subject name 2. ... in Hungarian Közlekedési humán erőforrás menedzsment 3. Programme code Κ 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 3 7. Evaluation type m 8. Form hours 1 lecture 1 laboratory 9. Weekly contact hours 10. Language English 0 practice 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education 11. SDG 4 Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Contact hours 28 hours 10 hours Homework 20 hours seminars **Midterm test Reading written Exam preparation** 20 hours 0 hours 12 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Kővári Botond kovari.botond@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Kővári Botond - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject Acquiring knowledge related to human resource development. 20. Thematics of lectures Carrier planning, ability development, time management, recruitment, presentation, negotiation techniques. Special human management knowledge in transport companies: culture, trainings, stress, teamwork, leadership evaluation. 21. Thematics of practices 22. Thematics of laboratories On labor meetings, students make a homework presentation and discuss each others papers. 23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters) The student a) knowledge (t) 1. knows the structure and tasks of the human management strategy of companies (T10) 2. knows the goals of motivation and the process of effective workforce allocation (T10) 3. knows effective communication techniques (T10) b) skills (k) 1. evaluates the operation of the human management system 2. evaluates and manages the performance of employees c) attitude (a) 1. strives to the best of his/her abilities to solve complex economic tasks 2. strives to solve complex problems in his/her work, always taking into account multiple aspects 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 2. feels responsible for the results and quality of his work 24. Midterm assessments Share in final Name Code **Assessed learning outcomes** grade 1. midterm test 1. ZH 1.50% 1. t1,t2,t3,k1,k2,o1

2. F1

2.50%

2. t1,t2,t3,k1,k2,a1,a2,o2

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Name	Code	Share in final grade	Assessed learning outcomes		
-	-	-	-		
26. Conditions for obtaining signature / midterm gra	27. Final grade in percentage of performance				
successful (min. 50%) completion of the midterm test ar paper	Excellent 88-100%				
28. Attendance and participation requirements	Good 75-87%				
according to the rules of CoS	Satisfactory 63-74%				
29. Late completion opportunities	Fail 0-49%				
second retake or delayed completion is only from one m					
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					

1. midterm test

2. midterm test

3. individual homework

1/76 oldal

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Information connection of the vehicle and the track 1. Subject name 3. Programme code 2. ... in Hungarian Jármű-pálya információs kapcsolata κ 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 3 7. Evaluation type m 8. Form hours 2 lecture 9. Weekly contact hours 0 practice 0 laboratory 10. Language English **9** INDUSTRY, INNOVATION AND INFRASTRUCTURE 11. SDG Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Contact hours 28 hours 4 hours Homework 24 hours seminars **Midterm test Reading written Exam preparation** 22 hours 12 hours 0 hours materials preparation 13. Organisational unit in Department of Control for Transport and Vehicle Systems charge 15. Email 14. Subject coordinator Dr. Szabó Géza szabo.geza@kjk.bme.hu address 16. ...department Department of Control for Transportation and Vehicle Systems **17. Lecturers** Dr. Szabó Géza - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject The course provides an overview of the procedures and methods of information transfer between the vehicle and the track in different transport sectors. In addition, it presents technologies and traffic management methods developed based on information transfer. The course focuses on the needs assessment, specification and selection of appropriate technology for communications in transport systems. 20. Thematics of lectures Specifics of communications; general communication techniques. Wired and broadcast transmissions; characteristics of broadcast transmissions. Steps to specify communication needs; the conditions for fulfilling the specification; choice of available technologies for communication. 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. understands and can apply communication techniques; has knowledge of communication theory related to transport and vehicle engineering. b) skills (k) 1. is able to analyze or specify communication sub-systems in the field of transport and vehicle. c) attitude (a) 1. participates in solving communication problems in the field of transport or vehicle, to work efficiently and willingly with specialists of other fields (in particular: electrical engineering). d) autonomy and responsibility (o) 1. is aware of and treats the responsibility associated with the task solution during transport system communication analysis and specification. 24. Midterm assessments Share in final Name Code Assessed learning outcomes grade 1. ZH

1.40%

2.40%

3.20%

2. ZH

3. EF

1. t1,k1,a1,o1

2. t1,k1,a1,o1

3. t1,k1,a1,o1

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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		
For the final mark the individual homework and the two midterm test shall be completed.					
28. Attendance and participation requirements				0%-49%: fail; 50%-60%: pass; 61%-70%: satisfactory; 71-80%: good; 81%-100%: excellent	
according to the rules of CoS					
29. Late completion opportunities					
One midterm test can be retried and the homework can be delayed submitted at the end of the semester.				-	
30. Consultation opportunities					
Consultation is possible at a time ar	nd in a form agreed with	the teacher			
31. Validity of the subject datasheet starts from:					
01 September, 2025	01 September, 2025				

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering						
1. Subject name	Intelligens	trans	sportatio	on systems		
2 in Hungarian	Intelligens közlekee	dési rend	szerek		3. Programme code	К
4. Subject code					5. Term role	1/2 k
6. Credits	5	7. Evalu	ation type	m	8. Form	with contact hours
9. Weekly contact hours	2 lecture	0 practi	се	2 laboratory	10. Language	English
11. SDG 11 sustainable cities Learning outcomes' 11 sustainable Sustainable 11 sustainable Development Goals 11 sustainable						
12. Working hours for fulfill	ling the requiremer	nts of the	e subject			150 hours
Contact hours	56 hours	Prepara semina	ition for rs	10 hours	Homework	44 hours
Reading written materials	10 hours	Midterm preparat	test ion	30 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Trar	nsport Te	chnology and	Economics		
14. Subject coordinator	Dr. Tóth János			15. Email address	toth.janos@kjk.bme.hu	
16department	Department of Trar	nsport Te	chnology and	Economics		
17. Lecturers	Dr. Tóth János, Dr.	. Eszterga	ár-Kiss Domol	kos, Soltész Tamás		
18. Indicative prerequisites						
19. Aim of the subject						
Understanding the characteri	stics of intelligent tra	ansportat	ion systems, a	application of GIS. Un	derstanding the MaaS co	oncept.
20. Thematics of lectures						
Keywords of intelligent transp mobility management system Features of Demand Respon Hungarian and international b	oort systems. ITS dir , the structure of the sive Transport, area pest practices.	ective of integrate of use, c	EU. Classifica ed transport d classification c	ation of ITS systems b atabase. Data standa f systems. Route pla	based on transport mode ards. The NESZIP an NE nning of DRT, economic	s. Tasks of a JP systems. features.
21. Thematics of practices						
22. Thematics of laboratories						
Introduction to GIS, QGIS pra Service, Transportation data	actice, Location base bases and data colle	ed service ection sys	es, Route plar tems, Homew	nning methods, Multin ork presentations.	nodal journey planners, N	lobility as a
23. Subject learning outcom	nes (lowercase lett	ers) and	their connec	tion to programme	level learning outcome	s (capital letters)
 I he student a) knowledge (t) 1. Familiar with types and features of ITS, the relevant terms and standards. (T3,T9) 2. Knows the attributes and advantages of multimodal systems. (T3) 3. Knows the conditions of development demand responsive transport. (T3,T5) b) skills (k) 1. Ability to apply of GIS in planning of ITS systems. (K3,K7,K14) 2. Able to examine and analyse ITS systems. (K4,K6) c) attitude (a) 1. Strive to acquire the highest level of system approach (A1,A2,A3,A4,A6,A7,A10) d) autonomy and responsibility (o) 1. Responsible applies of acquired knowledge in individual or in team work. (O3) 						
24. Midterm assessments				Chara in first		
Name			Code	Snare in final grade	Assessed learning ou	tcomes
 nornework, homework, theoretical midterm test, pracical midterm test. 			1. HF1, 2. HF2, 3. ZHe, 4. ZHgy	1. 17% 2. 17% 3. 33% 4. 33%	1. K1,a1 2. k1,a1 3. t1,t2,t3,k2,o3 4. k1,o3	

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25. Exam assessments			
Name	Code	Share in final	Assessed learning outcomes

		grade	-		
-	-	-	-		
26. Conditions for obtaining signature / midterm grad	27. Final grade in percentage of performance				
submission of the home assignments on time, and succese each midterm test	Excellent 85-100% Good 70-84%				
28. Attendance and participation requirements					
according to the rules of CoS			Satisfactory 60-69%		
29. Late completion opportunities			Pass 50-59%		
midterm test second correction for those who were not present on one of the tests, delayed deadline for homework			Fail 0-49%		
30. Consultation opportunities					
After the class, in previously agreed times, and per e-mai					
31. Validity of the subject datasheet starts from:					
01 September, 2025					

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Management of transport and logistic services 1. Subject name 2. ... in Hungarian Közlekedési és logisztikai szolgáltatások menedzselése 3. Programme code κ 4. Subject code 5. Term role 4/3 | sp with contact 6. Credits 6 7. Evaluation type m 8. Form hours 2 lecture 9. Weekly contact hours 0 laboratory 10. Language English 2 practice 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education 11. SDG 4 Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for Contact hours** 56 hours 19 hours Homework 35 hours seminars **Midterm test Reading written** 35 hours **Exam preparation** 0 hours 35 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Kővári Botond kovari.botond@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Kővári Botond - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject Mastering the economic characteristics of the transport and logistics market. 20. Thematics of lectures Features of transport and logistics services markets. Identifying factors that determine the needs for transport and logistic services. Methods for determining demand. Quantification of service quality. Defining and calculating KPI numbers. 21. Thematics of practices Development of a transport or logistics service performance indicator system. 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 specifics of the transport and logistics service markets (T10) 2. understands the methods of determining the demand appearing in the market (T10) 3. knows the theoretical and practical solutions for measuring service quality (T10) 4. knows the steps of developing a service performance indicator system (T10) b) skills (k) 1. evaluates the most important problems to be solved in the transport and logistics system 2. evaluates and manages the appropriate KPI indicators c) attitude (a) 1. strives to the best of his/her abilities to solve complex economic tasks 2. strives to solve complex problems in his/her work, always taking into account multiple aspects 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 2. feels responsible for the results and quality of his work 24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
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1. midterm test	1. ZH	1. 50%	1. t1,t2,t3,t4,k1,k2,o1		
2. homework paper	2. F1	2. 50%	2. t1,t2,t3,t4,k1,k2,a1,a2,o2		
25. Exam assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
-	-	-	-		
26. Conditions for obtaining signa	27. Final grade in percentage of performance				
successful (min. 50%) completion of paper	Excellent 88-100%				
28. Attendance and participation	Good 75-87%				
according to the rules of CoS	Satisfactory 63-74%				
29. Late completion opportunities	Fail 0-49%				
second retake or delayed completio					
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					

MSc training programme transportation.bme.hu 1/76 oldal Version: 08 May, 202				ersion: 08 May, 2025	
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering Subject datasheet					
1. Subject name	Meteorolo	ду			
2 in Hungarian	Meteorology			3. Programme code	К
4. Subject code				5. Term role	4/3 sp
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	4 education 8	BECENT WORK AND ECONOMIC GROWTH 9 AND INFRASTRUCT AND INFRASTRUCT	TURE 12 RESPONSIBLE CONSUMPTION AND PRODUCTION		
12. Working hours for fulfil	ling the requireme	nts of the subject			90 hours
Contact hours	28 hours	Preparation for seminars	4 hours	Homework	0 hours
Reading written materials	36 hours	Midterm test preparation	22 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Ae	ronautics and Naval Arch	itecture		
14. Subject coordinator	Jankovics István		15. Email address	jankovics.istvan@kjk.b	me.hu
16department	Department of Ae	ronautics and Naval Arch	itecture		
17. Lecturers	Jankovics István				
18. Indicative prerequisites					
19. Aim of the subject					
Students will learn about the information methods and me	meteorological phe ssages used in avia	nomena affecting aviatio ition.	n and their impact o	n air traffic, as well as the	e forecasting and
20. Thematics of lectures					
ATMOSPHERE – Structure of the atmosphere. Properties of atmosphere . The International Standard Atmosphere. VISIBILITY – Basics, Humidity, Haze, Measurement CLOUDS, PRECIPITATION – Cloud formation. Convection. Cloud Classification. Precipitation, WINDS, THUNDERSTORMS, ICING – WINDS. Measurement. Forces. Wind Gradient. Thunderstorms, Supercells, Dangers of thunderstroms. AIR MASSES AND WEATHER FRONT– Warm front. Cold Front. Occlusion. Stationary front. Convergence and squall lines. GLOBAL CLIMATOLOGY - Climatology. Jetstream. Low and High pressure areas WEATHER REPORTS – Weather infromation. Weather Reports and Forecasts (METAR_TAE and others)					
21. Thematics of practices					
- 22 Thematics of laboratori	85				
-					
23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)					
 a) knowledge (t) 1. Knows the meteorological phenomena affecting air traffic, their impact and threats to air traffic (T10) 2. Is familiar with the weather and forecast information methods used in aviation (T10) b) skills (k) 1. Is able to assess the impact of a given weather phenomenon on aviation, from a safety, economic, operational, etc. perspective (K2, K3, K6, K9) 2. Is able to to interpret different aeronautical meteorological messages c) attitude (a) 1. strives for precise, aesthetic, clear and transparent documentation 2. is interested, responsive, meets deadlines d) autonomy and responsibility (o) 1. is be able to produce documentation independently 					
2. understands the importance	ce of their work and	the consequences of err	ors		

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24. Midterm assessments				
Name		Code	Share in final grade	Assessed learning outcomes
1. midterm test		1. ZH	1. 100%	1. t1,t2,k1,k2,a1,a2,o1,o2
25. Exam assessments				
Name		Code	Share in final grade	Assessed learning outcomes
-		-	-	-
26. Conditions for obtaining sign	27. Final grade in percentage of performance			
pass the final examination with at least 50% of the marks				Excellent 80-100%
28. Attendance and participation	Good 70-79%			
According to the rules of Study and	Satisfactory 60-69%			
29. Late completion opportunities				Pass 50-59%
Repeated replacement of the midterm test is available.				Fail 0-49%
30. Consultation opportunities				
at a time and in a form agreed with	the lecturers			
31. Validity of the subject datash	eet starts from:			
01 September, 2025				
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Modeling and control of vehicular traffic systems 1. Subject name 2. ... in Hungarian Járműforgalmi rendszerek modellezése és irányítása 3. Programme code Κ 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 6 7. Evaluation type е 8. Form hours 2 lecture 9. Weekly contact hours 0 laboratory English 2 practice 10. Language **3** GOOD HEALTH AND WELL-BEING 8 DECENT WORK AND ECONOMIC GROWTH INDUSTRY, INNOVATION 11. SDG AND INFRASTRUCTURE Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for** Contact hours 56 hours 0 hours Homework 34 hours seminars **Reading written Midterm test** 24 hours 34 hours 32 hours Exam preparation materials preparation 13. Organisational unit in Department of Control for Transport and Vehicle Systems charge 15. Email 14. Subject coordinator Dr. Varga István varga.istvan@kjk.bme.hu address 16. ...department Department of Control for Transportation and Vehicle Systems **17. Lecturers** Dr. Varga István, Dr. Tettamanti Tamás, Wágner Tamás - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject The aim of the course is to familiarise students with the design and operation of road traffic management systems, from modeling and measurement to applied control tools/methods. 20. Thematics of lectures Road Traffic Measurements - Smoothing, Filtering, and Prediction Moving Average, Exponential Smoothing, Recursive Least Squares Estimator, Kalman Filter, Moving Horizon Estimation (MHE), Kriging, Genetic Algorithms (GA) Macroscopic (Store-and-Forward) Traffic Modeling Microscopic Traffic Modeling Mesoscopic Traffic Modeling Application of Artificial Intelligence (AI) in Road Traffic Automation 21. Thematics of practices Application of Store-and-Forward Traffic Modeling LQR for Urban Perimeter Control Fundamental Diagram Fitting Microscopic Traffic Modeling Mesoscopic Traffic Modeling Application of Artificial Intelligence (AI) in Road Traffic Automation 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. understands the structure and operation of traffic control systems, and is familiar with the levels and methods of traffic modeling (T9) b) skills (k) 1. capable of modeling a traffic network, designing its control, and designing traffic measurement and estimation systems (K11) c) attitude (a) 1. open to conduct research in traffic management systems (A2) d) autonomy and responsibility (o)

1. able to independently design traffic management strategies (O3)

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24. Midterm assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. written midterm test	1. ZH	1. 50%	1. t1,k1
2. practice task 1.	2. GYF1	2.0%	2. t1,k1,a1,o1
3. practice task 2.	3. GYF2	3.0%	3. t1,k1,a1,o1
4. practice task 3.	4. GYF3	4.0%	4. t1,k1,a1,o1
5. practice task 4.	5. GYF4	5.0%	5. t1,k1,a1,o1
6. practice task 5.	6. GYF5	6.0%	6. t1,k1,a1,o1
7. practice task 6.	7. GYF6	7.0%	7. t1,k1,a1,o1
25. Exam assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. oral exam	1. Vizsga	1. 50%	1. t1,k1,a1,o1
26. Conditions for obtaining signature / midterm grade			27. Final grade in percentage of performance
Submission of assignments on lessons and succes midterm test	Excellent 88-100%		
28. Attendance and participation requirements	Good 75-87%		
according to the rules of CoS			Satisfactory 63-74%
29. Late completion opportunities			Pass 50-62%
Second retake or delayed completion of the midter			

30. Consultation opportunities

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

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BUDAPEST UNIVERS	BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering				
1. Subject name	Packaging	technology			
2 in Hungarian	Csomagolástechnika	a		3. Programme code	К
4. Subject code				5. Term role	4/3 sp
6. Credits	3	7. Evaluation type	m	8. Form	with contact hours
9. Weekly contact hours	0 lecture	1 practice	1 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 EDUCATION 8 E	ecent work and conomic growth I 9 and infrastru	VATION 11 SUSTAINABLE CITIES 1	13 CLIMATE	17 PARTINERSHIPS FOR THE GOALS
12. Working hours for fulfil	ling the requirement	s of the subject		1	90 hours
Contact hours	28 hours	seminars	17 hours	Homework	30 hours
Reading written materials	15 hours	Nidterm test preparation	0 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Mater	rial Handling and Log	istics Systems		
14. Subject coordinator	Dr. Kovács Gábor		15. Email address	kovacs.gabor@kjk.bm	e.hu
16department	Department of Mater	rial Handling and Log	istics Systems		
17. Lecturers	Dr. Kovács Gábor, E	Bakos András			
18. Indicative prerequisites	, , 				
19. Aim of the subject					
To familiarize students with the basics of packaging design.	he basic knowledge o	f packaging technolog	gy related to logistics	, which can be used in pr	actice, and with the
20. Thematics of lectures					
-					
21. Thematics of practices			that fits a siver as		
of an optimal pallet unit load.	The placement of inf	formation bearing obj	ects. Preparing for ho	sumer packaging produc pmework.	t, the development
22. Thematics of laboratori	es				
Computer-aided packaging d with the aid of softwares.	lesign. 3D packaging (design. Unit load crea	ation under laboratory	/ conditions. Vehicle load	ing plan creation
23. Subject learning outcor	nes (lowercase lette	rs) and their connec	tion to programme	level learning outcome	s (capital letters)
The student a) knowledge (t) 1. knows the basics of packaging technology and the material used (T10) 2. knows the logistics aspects, requirements and design tools of packaging technology (T10)					
b) skills (k) 1. can design and use transport packages and unit loads correctly					
 c) attitude (a) 1. strives to organize and exe 2. interested in new things, h d) autonomy and responsible 1. independently responsible 2. aware of the significance of 	ecute packaging proce as a cooperative attitu bility (o) for operating packagi of his work and the co	esses precisely during ide towards organizin ing processes, perfori nsequences of mistak	g his/her work Ig packaging process ming basic organizati res	ses ional and planning tasks	
24. Midterm assessments					
Name		Code	Snare in final grade	Assessed learning ou	Itcomes
1. semester task		1. F	1. 100%	1. t1,t2,k1,a1,a2,o1,o2	

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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% performance of the semester task is the condition of the final grade.			Excellent 87.5-100%		
28. Attendance and participation requirements			Good 75-87,5% Satisfactory 62,5-75%		
According to the rules of CoS.					
29. Late completion opportunities			Pass 50-62,5%		
A semester task once can be resubmitted by the end of c	lelayed comple	etion week.	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					

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering				ect datasheet	
1. Subject name	Passenge	r transportatio	on systems		
2 in Hungarian	Személyközlekede	ési rendszerek		3. Programme code	К
4. Subject code				5. Term role	1/2 k
6. Credits	5	7. Evaluation type	e	8. Form	with contact
9. Weekly contact hours	2 lecture	2 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	3 GOOD HEALTH AND WELL-BEING 	QUALITY 9 INDUSTRY, INNOVA EDUCATION 9 AND INFRASTRUCT Image: Construct of the second	TION 11 SUSTAINABLE CITIES 1	7 PARTNERSHIPS FOR THE GOALS	
12. Working hours for fulfil	lling the requireme	nts of the subject			150 hours
Contact hours	56 hours	Preparation for seminars	15 hours	Homework	34 hours
Reading written materials	20 hours	Midterm test preparation	15 hours	Exam preparation	10 hours
13. Organisational unit in charge	Department of Tra	insport Technology and I	Economics		
14. Subject coordinator	Dr. Csiszár Csaba	L	15. Email address	csiszar.csaba@kjk.bm	e.hu
16department	Department of Tra	insport Technology and I	Economics		
17. Lecturers	Dr. Csiszár Csaba	i, Dr. Csonka Bálint, Dr. I	⁻ öldes Dávid		
18. Indicative prerequisites	, , 				
19. Aim of the subject					
To learn and master the methods of analysis, evaluation, modeling, and planning of the passenger transport system and its subsystems, with particular attention to new (transitional) modes of transport and the interconnection and substitutability of modes. To practice the application of the methods through data collection, analysis, evaluation, and planning tasks, taking into account geographical, settlement, and socio-demographic characteristics.					
20. Thematics of lectures					
Characterization of passenge Characterization of passenge Reconciliation of supply and Quality of passenger transport Car-sharing systems Planning of traffic calming an Planning of public transport s Planning of pedestrian and b Ride-sharing systems, chauf Taxi service, "Amusement tra	er transport demand er transport supply demand in passeng ortation services, me nd parking services nicycle traffic feur services ansportation"	er transport easures			
21. Thematics of practices					
Learning and mastering measurement, analysis, and design procedures at a skill level. Learning about case studies with the help of guest speakers. Independent literature research and topic processing supported by consultations; giving student presentations. Students are given (home) assignments to be solved independently (and/or in groups). Presentation of the results of the assignments.					
22. Thematics of laboratori	ies				
-					
23. Subject learning outcom	mes (lowercase let	ters) and their connect	ion to programme	level learning outcome	s (capital letters)
The student					
a) knowledge (t)	ladaa of elekelee '	al and according to the	aa (T2)		
2. Knows and understands the methodology and tools of the	ne properties and ap eir design and resea	pplication areas of solution rch. (T3,T7)	ons applied in the fie	ld of transport and transp	portation; the
3. Knows and understands th 4. Knows the widely applicat	ne information and o ble problem-solving t	communication technolog techniques necessary for	ies related to the fie r research or scienti	eld of transport and transp fic work. (T8)	portation. (T5)

b) skills (k)

1. Able to process and systematize information collected during the implementation of transport and transportation systems and processes, analyze, draw conclusions and explore relationships, and further develop information systems. (K4,K10)

2. Able to apply integrated knowledge of transport and transportation processes, vehicles implementing processes, process theory, and related fields of informatics. (K6)

3. Able to creatively handle problems in the field of transport and to flexibly solve complex tasks using innovative ideas. (K7,K14)

4. Able to conduct research and to conduct publication activities and negotiations in their field of expertise in their native language and at least one foreign language. (K5,K13)

c) attitude (a)

1. Open and receptive to learning about and accepting professional, technological development and innovation in the field of transport and transportation, and authentically conveying it. (A1,A2)

2. Strives to contribute to the development of new methods and tools related to transport and transportation, to have a broad perspective and to connect multiple modes. (A4,A9,A10)

3. Strives to carry out his/her work based on a systems and process-oriented mindset, in a complex approach, taking into account sustainability and economic aspects. (A6,A7)

d) autonomy and responsibility (o)

1. They are responsible for sustainability, health protection and environmental awareness, and take these aspects into account in their decisions. (O3,O4)

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm	1. ZH_1	1. 12,5 %	1. t1, t2, k2, a1, a2, a3
2. midterm	2. ZH_2	2. 12,5 %	2. t1, t2, k2, a1, a2, a3
3. home assignment_1	3. HF_1	3. 10 %	3. t1, t2, t3, t4, k1, k3, k4, a1, a2, a3, o1
4. home assignment_2	4. HF_2	4.5%	4. t1, t2, t3, t4, k1, k3, k4, a1, a2, a3, o1
5. home assignment_3	5. HF_3	5.5%	5. t1, t2, t3, t4, k1, k3, k4, a1, a2, a3, o1
home assignment_3_presentation of results	6. HF_3_B	6.5%	6. k4, a1

25. Exam assessments

Name	Code	Share in final grade	Assessed learning outcomes
1 oral exam	1 V	1 50 %	1 t1 t2 k2 a1 a2 a3

1. orar exam	1. V	1.00 /0	1. (1,12,12,01,02,00
26. Conditions for obtaining signature / midterm grad	e		27. Final grade in percentage of performance
mid-semester 'signature' is obtained if all the midterms are passed, and the assignments are submitted and accepted, and attendance on guest lectures is completed.			Excellent 88-100%
28. Attendance and participation requirements			Good 75-87%
According to the rules of CoS. Attendance on guest lectures is mandatory.			Satisfactory 63-74%
29. Late completion opportunities			Fail 0-49%
Up to one midterm test can be retaken in the delayed con	npletion 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 Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Planning of transport automation systems 1. Subject name 2. ... in Hungarian Közlekedésautomatikai rendszerek tervezése 3. Programme code κ 4. Subject code 5. Term | role 3/2 | sp with contact 6. Credits 6 7. Evaluation type е 8. Form hours 2 lecture 9. Weekly contact hours 2 laboratory 10. Language English 0 practice 8 DECENT WORK AND ECONOMIC GROWTH QUALITY Education **9** INDUSTRY, INNOVATION AND INFRASTRUCTURE 11. SDG 4 Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for Contact hours** 56 hours 25 hours Homework 35 hours seminars **Midterm test Reading written Exam preparation** 0 hours 18 hours 46 hours materials preparation 13. Organisational unit in Department of Control for Transport and Vehicle Systems charge 15. Email 14. Subject coordinator Dr. Bartha Tamás bartha.tamas@kjk.bme.hu address 16. ...department Department of Control for Transportation and Vehicle Systems **17. Lecturers** Dr. Bartha Tamás, Dr. Tettamanti Tamás, Lövétei István Ferenc, Farkas Balázs - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject Presentation of the development, safety aspects and systems integration of traffic control and safety equipment. 20. Thematics of lectures 1. Air transport: Airline side operation of civil air traffic management, software, practice. Daily maintenance and operation theory of civil aircrafts. Complex process design knowledge in civil aviation control. Software for the air traffic control, its input and output data, HMI. Automation systems at the airport. The ground handling processes. Planning of the airside operation. 2. Road transport: Modelling and controlling the road traffic by MATLAB-SIMULINK. Microscopic modelling of the road traffic by VISSIM simulator, realization of high level modelling techniques by programming VISSIM-COM-MATLAB. Application of the QGIS software to perform basic geoinformatics tasks. Macroscopic modelling of the road traffic by VISUM simulator. 3. Rail transport: Design steps in the field of interlocking and connected systems. Levels, structures, forms and notation of plans (Tender Plan, Authorozation Plan, Preliminary Plan, Construction Plan, Documents for the Operators, User Guides). Safety processes and approval procedures during the development and the implementation of interlocking and train controlling systems. 21. Thematics of practices 22. Thematics of laboratories Individual design 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 general structure and operation of traffic control systems (T10)

b) skills (k)

1. can break down a project task into elements based on specification,

2. can design a development process,			
3. can track and document a development process			
c) attitude (a)			
1. is open to independently carry out development tasks			
d) autonomy and responsibility (o)			
1. can make responsible decisions in a development proje	ect		
24. Midterm assessments		1	
Name	Code	Share in final grade	Assessed learning outcomes
1. design task 1.	1. TF1	1. 15%	1. t1,k1,k2,k3,a1,o1
2. design task 2.	2. TF2	2. 15%	2. t1,k1,k2,k3,a1,o1
3. design task 3.	3. 1F3	3. 15%	3. t1,k1,k2,k3,a1,o1
25. Exam assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. oral exam	1. SZV	1. 55%	1. t1,k1,k2,k3,a1,o1
26. Conditions for obtaining signature / midterm grade)		27. Final grade in percentage of performance
Submission of the completed and documented works. Dur be presented by the student.	ing the verbal	exam the work will	Excellent 88-100%
28. Attendance and participation requirements			Good 75-87%
according to the rules of CoS			Satisfactory 63-74%
29. Late completion opportunities			Pass 50-62%
the individual design tasks can be handed in until the end with a penalty fee	of the delayed	d completion week	Fall 0-49%
30. Consultation opportunities			
at a time and in a form agreed with the teacher			
31. Validity of the subject datasheet starts from:			
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BUDAPEST UNIVERS	SITY OF TECHNOLOG	ey and economics gineering and Ve	hicle Engineerir	ng Subj	ect datasheet
1. Subject name	Project ma	anagement in	transporta	tion	
2 in Hungarian	- Közlekedési proje	 ktirányítás		3. Programme code	К
4. Subject code				5. Term role	3/4 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	4 education 8	PECENT WORK AND ECONOMIC GROWTH AND INFRASTR	DVATION 11 SUSTAINABLE CITIES UCTURE 11 AND COMMUNITIES	17 PARTINERSHIPS FOR THE GOALS	
12. Working hours for fulfil	lling the requireme	nts of the subject			90 hours
Contact hours	28 hours	Preparation for seminars	8 hours	Homework	19 hours
Reading written materials	12 hours	Midterm test preparation	23 hours	Exam preparation	0 hours
13. Organisational unit in Department of Transport Technology and Economics					
14. Subject coordinator	Dr. Sipos Tibor		15. Email address	sipos.tibor@kjk.bme.h	u
16department	Department of Tra	insport Technology and	l Economics		
17. Lecturers	Dr. Sipos Tibor				
18. Indicative prerequisites	, , 				
19. Aim of the subject					
The aim of the course is to fa fundamental methods and to define project goals, identify resource planning, cost cont manage implementation risk	amiliarize students w ols of project manag stakeholders, and a rol and budgeting, ti s, design appropriat	vith the specific charact gement in the transport pply the methodology f me management, and s e project strategies, an	eristics of transport-r ation sector. During t or preparing prelimin scheduling. Students d handle both interna	related projects and to eq the course, students will h ary feasibility studies. En will also develop the abil al and external communic	uip them with the earn to clearly phasis is placed on ity to analyze and ation effectively.
20. Thematics of lectures					
Specialities of transport proje studies. Accounting and defi management of implementat	ects. Defining projec ning the necessary i tion . Development c	t goals. Identifying stak resources, budget man of project strategy, exte	eholders. Methodolo agement, time mana rnal-internal commur	gy for preparing prelimina gement, scheduling. Risk nication.	ary feasibility s analysis and
21. Thematics of practices					
-					
22. Thematics of laborator	ies				
-					
23. Subject learning outcom	mes (lowercase let	ters) and their connec	ction to programme	level learning outcome	es (capital letters)

The student

a) knowledge (t)

- 1. Understands the specific characteristics of transport projects, including goal definition and stakeholder identification. (T2,T9)
- 2. Is familiar with the methodology of feasibility study development and resource estimation in transport projects. (T2,T9)
- 3. Knows the strategic planning approaches in project management, including external and internal communication processes. (T9) **b) skills (k)**
- 1. Able to define transport project objectives and identify relevant stakeholders. (K4,K8,K9)
- 2. Able to develop complex transport project plans including budgeting and scheduling. (K6,K7,K9,K11)
- 3. Able to perform risk analysis and propose appropriate mitigation strategies. (K6,K8,K14)
- 4. Able to manage both internal and external project communications effectively. (K12)

c) attitude (a)

- 1. Strives to approach project work with a systems-based and process-oriented mindset. (A1,A4,A5,A7)
- 2. Committed to quality-driven and responsible project management practices. (A2,A5,A10)
- 3. Values diversity and sustainability throughout the project lifecycle. (A9,A10)

d) autonomy and responsibility (o)

1. Makes decisions independently while consulting other disciplines and assumes full responsibility. (O1,O2)

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2. Takes responsibility for the performance of	of subordinates and proce	esses under their supe	rvision. (O5)
3. Observes sustainability, legal, safety, and	ethical standards in all p	roject activities. (O2,C	4)
24. Midterm assessments			
Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH	1. 50%	1. t1,t2,t3,k1,k4,a1,a2
2. independent research assignment	2. F	2. 50%	2. k2,k3,a3,o1,o2,o3
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
submission and presentation of task on time midterm test	and successful (min. 50 ^o	%) completion of the	Excellent 88-100%
28. Attendance and participation requirem	nents		Good 75-87% Satisfactory 63-74% Pass 50-62%
according to the rules of CoS			
29. Late completion opportunities			
Midterm test correction possibility for those r deadline for home work.	Fail 0-49%		
30. Consultation opportunities			
at a time and in a form agreed with the teach	ner		
31. Validity of the subject datasheet start	s from:		
01 September, 2025			

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BUDAPEST UNIVERS	SITY OF TECHNOLOG	and economics gineering and Veł	nicle Engineerir	ng Sub	ject datasheet
1. Subject name	Safety in a	hir traffic cont	rol		
2 in Hungarian	Safety in air traffic	control		3. Programme code	К
4. Subject code				5. Term role	2/1 sp
6. Credits	3	7. Evaluation type	m	8. Form	with contact hours
9. Weekly contact hours	1 lecture	1 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE				
12. Working hours for fulfil	ling the requireme	nts of the subject			90 hours
Contact hours	28 hours	Preparation for seminars	4 hours	Homework	0 hours
Reading written materials	40 hours	Midterm test preparation	18 hours	Exam preparation	0 hours
13. Organisational unit in	Department of Co	ntrol for Transport and V	Vehicle Systems		
14. Subject coordinator	Dr. Meyer Dóra		15. Email address	meyer.dora@kjk.bme.	hu
16department	Department of Co	ntrol for Transport and V	Vehicle Systems		
17. Lecturers	Mudra István, Dr.	Meyer Dóra Zsófia			
18. Indicative prerequisites	, , 				
19 Aim of the subject					
The aim of the course is to put traffic management and aviat models, risk analysis method	rovide students with tion safety manager ls. human factors. a	advanced theoretical a nent, with particular foc nd software and hardwa	ind practical knowled us on the application are safety requireme	dge of the regulatory envi and evaluation of safety nts for critical systems.	ronment of air assessment
20. Thematics of lectures	,				
Organizational and regulatory environment of Air traffic control. Basic concepts of aviation safety. Safety assessment model (SAM, phase breakdown, tasks for each phase, FHA, PSSA, SSA, process for requesting relevant system requirements, hazard and risk analysis, system specification, system architecture definition, testing, commissioning, monitoring, verification and validation of the change process, certification, licensing, documentation). Flight safety criteria: system requirements, safety requirements, safety certification. Security Analysis Methodologies for Air Traffic Control Security Verification: Hazard Analysis Methodologies. Risk analysis. Consequences of faulty operation - determination of severity. Risk classification. Human factors of aviation safety. Safety requirements for software used in air traffic control. Hardware redundancies used in air traffic control. Event reporting systems. Event Investigation Process. Operational areas highlighted in terms of aviation safety.					
21. Thematics of practices					
The practical sessions are de	esigned to solve pro	blems related to the the	eoretical areas of kno	owledge.	
-	es				
23. Subject learning outcor	nes (lowercase let	ters) and their connec	tion to programme	level learning outcome	es (capital letters)
The student a) knowledge (t) 1. knows the aviation safety s 2. knows the principles and p 3. knows the EUROCONTRO 4. knows the legal backgrour 5. knows the incident reportin 6. knows the incident reportin 7. knows the ICAO defined s 8. knows the ISQMS b) skills (k) 1. is capable of analyzing, sp c) attitude (a)	strategy policies and procedures of hazard DL SAM process and of aviation related ng processes, system legal background; afety promotion action pecifying, developing	d methods; d and risk analysis of av d tools; d incident investigation a ms, surfaces; vities; g safety management sy	viation safety; and the incident inve ystems, subsystems	stigation process; in the field of air traffic co	ontrol
1. is interested in modern avi	ation safety solutior	ıs;			

1.60		
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2. capable of thinking in support of algorithmic safety haz	ard and risk a	analysis, which can be	e applied in other high security areas;			
participates in solving aviation safety problems in the fi other fields	eld of air traf	fic control, works effic	iently and willingly to work with specialists in			
d) autonomy and responsibility (o)						
1. is also able to individually apply the knowledge acquire	d here to oth	er systems unknown	to it			
24. Midterm assessments		-				
Name	Code	Share in final grade	Assessed learning outcomes			
1. midterm test 1	1. ZH1	1. 1/3	1. t1,t2,k1,a1,a2,a3,o1			
2. midterm test 2	2. ZH2	2. 1/3	2. t3,t4,t5,k1,a1,a2,a3,o1			
3. midterm test 3	3. ZH3	3. 1/3	3. t6,t7,t8,k1,a1,a2,a3,o1			
25. Exam assessments						
Name	Code	Share in final grade	Assessed learning outcomes			
-	-	-	-			
26. Conditions for obtaining signature / midterm grad	le	- I	27. Final grade in percentage of performance			
Three midterm exams, all must be sufficient.			Excellent 88-100%			
28. Attendance and participation requirements			Good 75-87%			
according to the rules of CoS			Satisfactory 63-74%			
29. Late completion opportunities			Pass 50-62%			
Second retake or delayed completion of two of the midterm tests is possible.						
30. Consultation opportunities						
At a time and in a manner agreed upon with the instructo	r					
31. Validity of the subject datasheet starts from:						

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MSc training programme	transport	ation.bme.hu	1/76 olda	l Ve	ersion: 08 May, 2025
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering Subject datasheet					
1. Subject name	Signal pro	cessing in tra	ansport		
2 in Hungarian	Jelfeldolgozás a kö	özlekedésben		3. Programme code	К
4. Subject code				5. Term role	4/3 sp
6. Credits	6	7. Evaluation type	m	8. Form	with contact
9. Weekly contact hours	2 lecture	2 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE				
12. Working hours for fulfill	ling the requireme	nts of the subject			180 hours
Contact hours	56 hours	Preparation for seminars	12 hours	Homework	17 hours
Reading written materials	63 hours	Midterm test preparation	12 hours	Exam preparation	20 hours
13. Organisational unit in charge	Department of Cor	ntrol for Transport and	Vehicle Systems		
14. Subject coordinator	Dr. Szabó Géza		15. Email address	szabo.geza@kjk.bme.	hu
16department	Department of Cor	ntrol for Transportation	and Vehicle Systems	6	
17. Lecturers	Dr. Szabó Géza				
18. Indicative	, ,				
prerequisites					
19. Aim of the subject					
The aim of the course is to le	arn about the practi	cal use of microproces	sors and microcontro	llers in the field of transp	ortation
20. Thematics of lectures					
Characteristics of micropoces Characteristics of microcontro by microcontroller: RS-232, F digital signals. Digital Signal I HW and SW systems. Sampl	ssors, internal archit ollers, the MCS-51 a RS-485, fail-safe RS Processors (DSPs). es in transportation	tectures, operation mod architecture. Internal re -485, CAN. Data protec Software developmen applications.	des. Linear and interr gisters, instruction se ction, secure data tra t processes, safety-re	uption controlled function et. Realization of the seria nsfer. A/D and D/A conve elated software developm	nning. al communication erters. Filtering of nent. Safety relted
21. Thematics of practices					
In practices, every student programs an own microprocessor type Intel-8051, on a computer based developping environment. In the first					
22. Thematics of laboratorio	es		· · · /	10	3 3 3
-					
23. Subject learning outcom	nes (lowercase let	ters) and their connec	ction to programme	level learning outcome	es (capital letters)
The student					
 a) knowledge (t) 1. knows the basics of building embedded systems, knows the basic serial communication techniques, knows the basic principles of A / D and D / A conversion, knows basic signal processing algorithms. b) skills (k) 1. is capable of programming embedded systems, to design data collection systems. c) attitude (a) 					
1. is interested in modern IT solutions.					
1, is able to apply the knowledge acquired here to other similar, vet unknown systems.					
24. Midterm assessments					
Name		Code	Share in final grade	Assessed learning of	utcomes
1. midterm test		1. ZH	1.9%	1. t1,k1,a1,o1	
2. midterm test		2. ZH	2.9%	2. t1,k1,a1,o1	
25. Exam assessments					

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Name	Code	Share in final grade	Assessed learning outcomes		
1. oral exam	1. SZV	1. 67%	1. t1,k1,a1,o1		
26. Conditions for obtaining signature / midterm g		27. Final grade in percentage of performance			
In the study period two midterm tests and one homew of the signature, and consequently of the final exam.	re the prerequisites				
28. Attendance and participation requirements		0%-49%: fail; 50%-60%: pass; 61%-70%:			
according to the rules of CoS			satisfactory; 71-80%: good; 81%-100%: excellent		
29. Late completion opportunities					
Both midterm test and the homework can be retried o					
30. Consultation opportunities					
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 UNIVERS	SITY OF TECHNOLOG	BY AND ECONOMICS gineering and Vel	hicle <mark>Engine</mark> eri	ng	ect datasheet	
1. Subject name	I. Subject name Smart city					
2 in Hungarian	Intelligens városok	 Smart city 		3. Programme code	К	
4. Subject code	BMEKOKKMsK1	A01-00		5. Term role	2/1 sp	
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' 11 SUSTAINABLE CITIES contribution to EU/UN Sustainable Image: Sustainable Development Goals Image: Sustainable Image: Sustainable						
12. Working hours for fulfil	lling the requireme	nts of the subject			90 hours	
Contact hours	28 hours	Preparation for seminars	4 hours	Homework	20 hours	
Reading written materials	26 hours	Midterm test preparation	12 hours	Exam preparation	0 hours	
13. Organisational unit in charge	Department of Tra	nsport Technology and	l Economics			
14. Subject coordinator	Dr. Esztergár-Kiss	Domokos	15. Email address	esztergar-kiss.domoko	s@kjk.bme.hu	
16department	Department of Tra	insport Technology and	Economics			
17. Lecturers	Dr. Esztergár-Kiss	Domokos, Dr. Tóth Já	nos			
 18. Indicative prerequisites 19. Aim of the subject 	18. Indicative prerequisites					
The knowledge of the basics	, models, functions,	and operation of intellig	gent cities.			
20. Thematics of lectures			-			
Paradigm shift in urban citize strategies. Introduction to lar from social media and mobili Hungarian best practices.	en life. Smart city inti nd use functions and ity patterns. Big data	roduction, evaluation ar I models. Shared space a and Internet of Things	nd ranking methods. es, public space tran solutions. Smart G	. City planning aspects, m isformation. Utilization of i rids and its applications. T	ethods and nformation received op international and	
21. Thematics of practices						
-						
22. Thematics of laborator	ies					
-		4	41 4			
The student a) knowledge (t) 1. is familiar with the Smart City concept.						
2. identifies urban planning models,						
3. describe the types of social media,						
4. identify methods of mobility patterns, 5. collect data types of Big Data (T10)						
6. understand the Internet of	Things model and it	ts properties.				
b) skills (k)	b) skills (k)					
1. able to define Smart City features,						
2. calculates with the assess 3.knows the land use models	sment methodologies S.	5,				
4. uses the road planning pri	nciples,					
5. uses the Big Data approac	ches,					
o. aistinguisnes between Sm	iari Grid elements.					

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- c) attitude (a)
- 1. provide maximalized abilities,

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- 2. extends the knowledge by their own ,
- 3. strives for precise task solving.

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d) autonomy and responsibility (o)						
1. responsibly applies the knowledge acq	uired during the course,					
1. accepts the framework of cooperation,						
3. can concuct work individually or in a te	am.					
24. Midterm assessments						
Name	Code	Share in final grade	Assessed learning outcomes			
1. homework,	1. HF,	1. 33%	1. a1,a2,a3,o1			
2. first midterm test,	2. ZH1,	2.33%	2. t1,t2,t3,t4,t5,t6,K1,K3,K4,K5,K6			
25. Exam assessments	2. 2112	3. 33 70	J. KZ,K4,KJ			
		Share in final				
Name	Code	grade	Assessed learning outcomes			
-	-	-	-			
26. Conditions for obtaining signature	27. Final grade in percentage of performance					
submission of the home assignment on time, and successful (min. 50%) completion of each midterm test						
28. Attendance and participation requi	rements		Good 70-84%			
according to the rules of CoS			Satisfactory 60-69%			
29. Late completion opportunities			Pass 50-59%			
midterm test second correction for those deadline for homework	Fail 0-49%					
30. Consultation opportunities						
After the class, in previously agreed times, and per e-mail.						
31. Validity of the subject datasheet starts from:						
01 September, 2025						

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Strategic policy instruments in transportation 1. Subject name 2. ... in Hungarian Stratégiai szabályozási eszközök a közlekedésben 3. Programme code κ 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 6 7. Evaluation type е 8. Form hours 2 lecture 9. Weekly contact hours 1 practice 1 laboratory 10. Language English **3** GOOD HEALTH AND WELL-BEING DECENT WORK AND INDUSTRY, INNOVATION SUSTAINABLE CITIES FCONOMIC GROWTH AND INFRASTRUCTURE INFOUAL ITIES 11. SDG Learning outcomes' contribution to EU/UN 13 CLIMATE **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 180 hours **Preparation for** Contact hours 56 hours 8 hours Homework 32 hours seminars **Reading written Midterm test** 34 hours 30 hours 20 hours **Exam preparation** materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Mészáros Ferenc meszaros.ferenc@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics 17. Lecturers Dr. Mészáros Ferenc - - -, 18. Indicative - - -. prerequisites - - -

19. Aim of the subject

Within the framework of the course, students will learn the techniques and steps of transport policy and strategy making, as well as the transport policy objectives and instruments used in each field.

20. Thematics of lectures

The need for transport policy and strategy, identification of the relevant market areas, the regulatory process. The environmental, economic and social aspects of sustainable mobility and the mainstreaming of horizontality in transport policy. European mobility strategy and its measures, infrastructure reform and regulation. Policy achievements in urban transport and freight, challenges of traffic and mobility management. Policy achievements in interoperable, interconnected and automated transport. Policy achievements in greening transport and the automotive industry.

21. Thematics of practices

Tools and techniques for policy preparation, evaluation and decision-making.

22. Thematics of laboratories

Financial and economic modelling of policy decisions.

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

The student

a) knowledge (t)

1. understand the process of transport policy and strategy making and the technical, legal, financial, economic, social and institutional framework and related R&D and innovation directions (T10)

b) skills (k)

1. be able to identify the main problems of the transport system, select the transport policy instruments to address them, evaluate their results and impacts, and identify the needs for the development of transport policy instruments

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 open to new and innovative ideas and research, is self-critical in the tasks entrusted to him/her, and is fully committed to sustainability

d) autonomy and responsibility (o)

1.60		
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 ensures that, in addition to narrow professional aspects, sustainability aspects are also taken into account in the use of his/her knowledge, is able to self-check and correct errors independently, while taking into account the professional opinions of others
 can make responsible decisions in the field of transport engineering management in response to open questions, and can formulate independent proposals to resolve the challenges identified

24. Midterm assessments

Name	Code	Share in final grade	Assessed learning outcomes
1. midterm test	1. ZH1	1. 17,5%	1. t1,k1
2. midterm test	2. ZH2	2. 17,5%	2. t1,k1
3. holistic transport policy individual assignment	3. HF	3. 15%	3. k1,a1,a2,o1,o2
4. specific transport policy individual assignment	4. SF	4. 15%	4. k1,a1,a2,o1,o2
25. Exam assessments			

Name	Code	grade	Assessed learning outcomes		
1. oral exam	1. V	1.35%	1. t1,k1,a1,a2,o1,o2		
26. Conditions for obtaining signature / midterm grad	27. Final grade in percentage of performance				
successful completion (min. 50%) of each of the two mid presentation of the two individual assignments by the de-	Excellent 88-100%				
28. Attendance and participation requirements	Good 75-87%				
according to the rules of CoS	Satisfactory 63-74%				
29. Late completion opportunities			Fail 0-49%		
second retake or delayed completion is only from one mi	dterm requir	ement			
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					

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering					ject datasheet
1. Subject name	Supply ch	ain operation	control		
2 in Hungarian	Ellátási lánc irány	ítás		3. Programme code	К
4. Subject code				5. Term role	4/3 sp
6. Credits	3	7. Evaluation type	m	8. Form	with contact
9. Weekly contact hours	2 lecture	0 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 QUALITY EDUCATION	DECENT WORK AND ECONOMIC GROWTH ECONOMIC GROWTH 9 AND INFRASTRU	ATION TURE 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	17 PARTNERSHIPS FOR THE GOALS	
12. Working hours for fulfi	lling the requireme	ents of the subject			90 hours
Contact hours	28 hours	Seminars	5 hours	Homework	0 hours
Reading written materials	37 hours	Midterm test preparation	20 hours	Exam preparation	0 hours
13. Organisational unit in	Department of Ma	aterial Handling and Logi	stics Systems		
14. Subject coordinator	Dr. Bóna Krisztiár	1	15. Email	bona.krisztian@kjk.bn	ne.hu
16department	Department of Ma	terial Handling and Logi	stics Systems		
17. Lecturers	Dr. Bóna Krisztiár	n. Dr. Sárdi Dávid. Bertal	an Marcell		
		.,			
18. Indicative prerequisites	, , 				
19. Aim of the subject					
Describing the structure and companies integrated in the the methodological backgrou	operation of the va value chain. Solutio und of the applied to	lue (supply) chain and its ns for the management pols.	s characteristics. Pr and control of the e	resenting the operational enterprise value chain ope	background of ration, presenting of
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					
- 22 Thematics of laborator	ies				
23. Subject learning outco	mes (lowercase let	tters) and their connec	tion to programme	e level learning outcome	es (capital letters)
 The student a) knowledge (t) 1. knows the concept, structure, actors and processes of the value (supply) chain (T10) 2. knows the systems of procurement, production, sales and waste management, the challenges of managing the company's operations (T10) 3. can analyse the outputs and types of materials handled (T10) 4. knows the procedures used to determine material requirements (T10) 5. understands the challenges of demand planning and knows the procedures to be applied (T10) 6. knows the methods used to manage and control inventories (T10) 7. knows the methods used to manage and control production (T10) b) skills (k) 1. is able to identify the tasks, problems and challenges in the management of corporate operations 2. applies the analytical procedures learned in the assortment analisys in the categorisation of outputs and materials 					
3. is able to apply the BOM management tools and interpret data for material requirements planning					

4. can apply material requirements planning procedures

5. is able to use the methodological background learned in planning and analysing the demand

6. is able to analyse inventory systems and processes, to improve processes and to apply the methods learned in operational management

c) attitude (a)

1. seeks to be comprehensive in the acquisition of knowledge, cooperates with the teacher and fellow students, is empathetic and tolerant

2. is receptive and proactive in carrying out the tasks assigned to them, self-critical of the tasks assigned to them

- 3. interested in new things, receptive to new knowledge
- 4. tries to carry out tasks correctly, accurately and precisely

5. thinks in variations, strives to achieve results of appropriate quality in the shortest possible lead time

d) autonomy and responsibility (o)

1. is aware of the importance of their work and the consequences of mistakes

- 2. complies with environmental and social requirements in their chosen professional field
- 3. formulates independent proposals to address the challenges identified
- 4. is able to self-ckeck and correct errors independently by listening to the professional opinions of others
- 5. is able to take responsibility for their opinions and actions and to form theirown opinions
- 6. is critical of their own work and that of others

Name	Code	Share in final grade	Assessed learning outcomes
1. first midterm test	1. ZH1	1. 50%	1. t1-t7,k1-k6,a1-a5,o1-o6
2. second midterm test	2. ZH2	2. 50%	2. t1-t7,k1-k6,a1-a5,o1-o6

25. Exam assessments

24 Midtorm accomente

Name	Code	Share in final grade	Assessed learning outcomes			
-	-	-	-			
26. Conditions for obtaining signature / midterm gra	27. Final grade in percentage of performance					
The student has achieved minimum 30% for each of the 50% for the total points of two midterm tests.	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 tests can 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 Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Trade, financial and accounting techniques 1. Subject name 2. ... in Hungarian Kereskedelmi, pénzügyi és számviteli technikák 3. Programme code κı 4. Subject code 5. Term | role 3/2 | sp with contact 6. Credits 3 7. Evaluation type m 8. Form hours 1 lecture 9. Weekly contact hours 1 laboratory 10. Language English 0 practice 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 8 DECENT WORK AND ECONOMIC GROWTH 11. SDG Learning outcomes' contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Contact hours 28 hours 8 hours Homework 0 hours seminars **Midterm test Reading written Exam preparation** 24 hours 30 hours 0 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Mészáros Ferenc meszaros.ferenc@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Mészáros Ferenc - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject To provide the most basic trade, financial and accounting skills necessary for the performance of the duties of professional managers and supervisors in the freight forwarding and trade sector. **20. Thematics of lectures** The aspects of foreign trade transportation: foreign economic theories, regulatory framework, structure, elements, creation and implementation of the foreign trade contract. Foreign trade payment methods, the role of the forwarder. Banking operations, assets, securities required for carrying out transport services. Role and function of the stock markets. Elements of the accounting system of transport companies, basic rules. Accounting rules, operations. Types and elements of reports. 21. Thematics of practices -22. Thematics of laboratories Solving financing and accounding tasks of freight forwarding on computer. 23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters) The student a) knowledge (t) 1. knows the rules of internal and external trade concerning transport (K:T10;L:T9) identify the macro-financial framework affecting businesses (K:T10;L:T9) 3. understand basic accounting rules (K:T10;L:T9) b) skills (k) 1. the ability to choose between different commercial solutions (L:K11) 2. can evaluate the opportunities offered by financial operations (L:K9,K10) 3. be familiar with the corporate accounting system (L:K9,K10) 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 (L:A2,A4,A5,A7,A8,A9,A10) 2. is open to new and innovative ideas and research, is self-critical of the tasks assigned to him/her, and takes full responsibility for sustainability (L:A1,A3,A6) d) autonomy and responsibility (o)

1. in addition to the narrow professional aspects, ensures sustainability aspects in the use of his/her knowledge, is able to self-check and correct errors independently by listening to the professional opinion of others (L:O3,O4)

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2. makes responsible decisions in the field of transport management in response to open questions and formulates independent proposals to solve identified challenges (L:O1,O2,O5)					
24. Midterm assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. midterm test	1. ZH1	1.50%	1. t1,t2,k1,k2,a1,a2,o1,o2		
2. midterm test	2. ZH2	2.50%	2. t2,t3,k2,k3,a1,a2,o1,o2		
25. Exam assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
-	-	-	-		
26. Conditions for obtaining signature / midterm grad	·	27. Final grade in percentage of performance			
successful (min. 50%) completion of both midterm tests			Excellent 88-100% Good 75-87%		
28. Attendance and participation requirements					
according to the rules of CoS			Satisfactory 63-74%		
29. Late completion opportunities			Pass 50-62%		
second retake or delayed completion is only from one midterm requirement 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					

Faculty of Trar	nsportation Er	ngineering and Vel	nicle Engineeri	ng	
1. Subject name	Traffic flo	W			
2 in Hungarian	Közlekedési árar	nlatok		3. Programme code	К
4. Subject code				5. Term role	2/1 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	3 GOOD HEALTH AND WELL-BEING	9 AND INFRASTRUCTURE 10 INFRASTRUCTURE	s 11 SUSTAINABLE CITIES		
12. Working hours for fulfil	ling the requirem	ents of the subject			120 hours
Contact hours	42 hours	Preparation for seminars	12 hours	Homework	27 hours
Reading written materials	25 hours	Midterm test preparation	14 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Tr	ransport Technology and	Economics		
14. Subject coordinator	Dr. Kisgyörgy La	jos	address	kisgyorgy.lajos@kjk.br	ne.hu
16department	Department of T	ransport Technology and	Economics		
17. Lecturers	Dr. Kisgyörgy La	jos, Kózel Miklós, Soltés	z Tamás		
18. Indicative prerequisites III, III, III, III, III, III, III, III					
Understanding methodologie their practical application and	es suitable for the o d adaptation to spe	qualification, quantitative cific transportation proble	description and opti ems.	mization of transport proc	esses; mastering
20. Thematics of lectures					
Stochastic parameters of road traffic flow and their relations. Characteristics and states of road traffic. Characteristics of intersections, signalized networks and their evaulation. Transport application of operations research methods and artificial intelligence (AI). Description of general queuing procedures. Evaulation of travel chains in urban transport. Correlation between public transport flow parameters. Characteristics of pedestiran flows, measurement techniques. 21. Thematics of practices Indroducing measurements and data analysis methods according to individual and group excercises.					
-					
 23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters) The student a) knowledge (t) 1. Knows the characteristics, states and relations of pedestrian, road and public transport flows (T3) 2. Knows the coordination and evaluation methods of traffic flows in signalized intersections (T3, T6, T7) 3. Knows methods for the evaluation of travel chains in urban transport (T7) 4. Knows optimalization methods can be applied in transport and the basics of queueing theory (T6, T7) b) skills (k) 1. Able to apply and elaborate methods for the qualification and improvement of traffic flow through various transport modes (K2, K4, K6, K7, K14) 2. Able to elaborate traffic survey methods to describe pedestrian, road and public transport flows (K2, K4, K7, K14) 3. Able to evaluate procedures, describe them numerically and design service facilities with the aim of queueing theory (K2, K4) (c) attitude (a) 1. Applies the indices and qualification systems for the evaluation of transport systems which describe traffic flow progress the best (A1, A2, A4, A7) 2. Applies adequate optimalization methods in the planning of transport systems' improvement (A2, A4, A7) 					
 Applies adequate of Aims to apply/elabo required data can be underst 	rate methods for the	ne qualification of transpo	ort systems which de	escribe the examined syst	em well, the

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d) autonomy and responsibility (o)					
 Able to elaborate technical problems on high standards alone or as a group member, as well (O2) Feels responsibility for the result and standard of their work; aims to describe reality as closely and accurately as possible when describing transport systems; aims to achieve optimal operation during the improvement of transport systems (O2) 					
24. Midterm assessments					
Name		Code	Share in final grade	Assessed learning	outcomes
 four optional home assignments from (with obligatory minimum total points) midterm test 1 midterm test 2 midterm test 3 	n nine options	1. HF 2. ZH1 3. ZH2 4. ZH3	1. 66,7% 2. 11,1% 3. 11,1% 4. 11,1%	1. t1-t4,k1-k3,a1-a3 2. t1-t4,k1-k3,a1-a3 3. t1-t4,k1-k3,a1-a3 4. t1-t4,k1-k3,a1-a3	,01,02 ,01,02 ,01,02 ,01,02
25. Exam assessments					
Name		Code	Share in final grade	Assessed learning	outcomes
-		-	-	-	
26. Conditions for obtaining signature / midterm grade				27. Final grade in performance	percentage of
Reaching the minimum points of assign successful completion of each of the th	ments and holding ree midterm tests.	presentation	ns of them,		
28. Attendance and participation req	uirements			Excellent 87,5-100%	
according to the rules of CoS				Good 75-87%	E 0/
29. Late completion opportunities				Pass 50-62%	,5%
home assignments can be completed with delay till the end of the retake period; any midterm test retake can be repeated, but the 3 tests can be retaken maximum 3 times in total				Fail 0-49%	
30. Consultation opportunities	30. Consultation opportunities				
either on in-class consultations or at a time and form agreed with the lecturers					
31. Validity of the subject datasheet	starts from:				
01 September, 2025					

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering					
1. Subject name	Traffic mo	delling			
2 in Hungarian	Forgalmi modellez	zés		3. Programme code	К
4. Subject code				5. Term role	2/1 sp
6. Credits	6	7. Evaluation type	e	8. Form	with contact hours
9. Weekly contact hours	1 lecture	0 practice	3 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	3 GOOD HEALTH AND WELL-BEING 	INDUSTRY, INNOVATION AND INFRASTRUCTURE 11 SUSTAINABLE			
12. Working hours for fulfil	lling the requireme	ents of the subject			180 hours
Contact hours	56 hours	Preparation for seminars	30 hours	Homework	30 hours
Reading written materials	24 hours	Midterm test preparation	20 hours	Exam preparation	20 hours
13. Organisational unit in charge	Department of Tra	ansport Technology and	Economics		
14. Subject coordinator	Dr. Tóth János		15. Email	toth.janos@kjk.bme.h	u
16department	Department of Tra	ansport Technology and	Economics		
17. Lecturers	Dr. Tóth János, A	ba Attila			
18. Indicative	, ,				
prerequisites					
19. Aim of the subject					
Learn and apply the basics of	of traffic micro and n	nacro modelling through	practice.		
20. Thematics of lectures					
Basics of transport modelling their parameters. Network m theory of applied softwares.	g. Process of transp odel, demand mode Microscopic modelli	ort network planning an ell, impact model. Metho ng with VISSIM software	d application in VIS ds of traffic assignn e.	UM szoftver. Traffic assig nent in private and public	nment models and transport. The
21. Thematics of practices					
-					
22. Thematics of laborator	ies				
In the framework of team wo	rk a VISSIM and VI	SUM modelling tasks ar	e prepared.		
23. Subject learning outcom	mes (lowercase let	ters) and their connec	tion to programme	e level learning outcome	es (capital letters)
 a) knowledge (t) 1. Knows the basics of micro- and macro-modelling. (T10) 2. Knows the main functions of the VISSIM and VISUM software. (T10) b) skills (k) 1. Is able to use the software and apply modeling methodologies. c) attitude (a) 1. Strives to use modeling procedures routinely. d) autonomy and responsibility (o) 1. Uses the software independently and responsibly. 					
24. Midterm assessments					
Name		Code	Share in final grade	Assessed learning o	utcomes
1. Progress consultation (in o 2. Homework presentation (r 3. Homework presentation (r 25. Exam assessments	class) nacroscopic modelli nicroscopic modellir	1. K ing) 2. HF1 ng) 3. HF2	1. 10% 2. 25% 3. 25%	1. a1,o1 2. t1,t2,k1 3. t1,t2,k1	
Name		Code	Share in final	Assessed learning o	utcomes
1. written exam		1. V	1. 40%	1. t1,t2,k1,a1,o1	

MSc training programme	transportation.bme.hu	2/76 oldal	Version: 08 May, 2025
26. Conditions for obtaining sign	ature / midterm grade	27. perf	Final grade in percentage of ormance
submission and presentation of hon	ne assigments	Exce	ellent 89-100%
28. Attendance and participation	Goo	d 77-88%	
according to the rules of CoS		Sati	sfactory 65-76%
29. Late completion opportunities	Pas	s 42-65%	
the home assignement can be delay	yed completed till end of delayed cor	npletion period Fail	0-41%
30. Consultation opportunities			
during in-class consultations			
31. Validity of the subject datashe	eet starts from:		
01 September, 2025			

MSc training programme	transpor	tation.bme.hu	1/76 olda	1 V	ersion: 08 May, 2025
BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering					
1. Subject name	Transport	automation A	N		
2 in Hungarian	Közlekedési auto	matika M		3. Programme code	К
4. Subject code				5. Term role	1/2 k
6. Credits	6	7. Evaluation type	m	8. Form	with contact hours
9. Weekly contact hours	3 lecture	2 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 QUALITY EDUCATION	DECENT WORK AND ECONOMIC GROWTH I DIAL STRY, INNOV AND INFRASTRUC	ATION 11 SUSTAINABLE CITIES		
12. Working hours for fulfi	lling the requireme	ents of the subject			180 hours
Contact hours	70 hours	Preparation for seminars	8 hours	Homework	28 hours
Reading written materials	56 hours	Midterm test preparation	18 hours	Exam preparation	0 hours
13. Organisational unit in	Department of Co	ntrol for Transport and V	ehicle Systems		
14. Subject coordinator	Dr. Bartha Tamás		15. Email address	bartha.tamas@kjk.bm	e.hu
16department	Department of Co	ntrol for Transportation a	and Vehicle Systems	;	
17. Lecturers	Dr. Bartha Tamás	, Lövétei István Ferenc,	Farkas Balázs		
18. Indicative prerequisites	18. Indicative prerequisites				
19. Aim of the subject					
The aim of the course is to fa safety requirements and the	amiliarise students v methods of verifyin	vith the philosophy of sa g the safety achieved.	fety-critical control s	ystems in transport, the	methods of defining
20. Thematics of lectures					
Basic safety concepts. Development of safety systems (system requirements, hazard and risk analysis, system specification, system architecture definition, module breakdown, module development, implementation, testing; system integration, verification and validation of the complete system; certification, licensing). Life cycle models. Safety life cycle. Development models. Failure management. Human factors in safety. Safety analysis. Safety management. Failure management of safety critical systems. Fault detection and fault location time. Safety criteria: system requirements, safety requirements, safety case. Hazard analysis: failure mode and effect analysis, hazard and operability analysis, event tree analysis, fault tree analysis, hazard analysis in the development life cycle. Risk analysis. Consequences of failure - severity. Probability of failure - frequency. Risk classification. Safety Integrity Levels. Risk graph, risk score matrix, ISO 26262 risk analysis method. Safety critical software. Safety critical software programming methods. Data protection. Program protection. RAM protection. Fault protection. Safety critical hardware. Hardware redundancies. Safety strategies. Safe life, Fail safe and Fault-tolerant systems. Real and quasi fail-safe systems. Cybersecurity (security of cyber physical systems). Formal methods and their application in safety critical systems. 21. Thematics of practices In practical lessons the students learn to apply different methods of hazard analysis and risk assessment (FMEA, FTA, HTA, HAZOP). 22. Thematics of laboratories					
23. Subject learning outco	mes (lowercase le	tters) and their connect	tion to programme	level learning outcom	es (capital letters)
The student					
1. is familiar with the concep	ots and mathematica	l apparatus related to sa	fety, risk and risk an	alysis (T4),	
2. is familiar with safety-critic	cal systems develop	ment methodologies and	safety architectures	s (T4),	

1.60		
MSC	training	programme
1.1~		programme.

3. is familiar with the process of building Petri net-based formal models, the meaning of temporal logics and their application in model checking (T5).

b) skills (k)

1. capable of performing safety analysis based on a given specification (K2, K4, K6, K10, K11),

2. capable of performing risk analysis of engineering systems (K2, K4, K6, K10, K11),

3. capable of building a formal model of an engineering system and of model checking (K2, K4, K6, K11, K14).

c) attitude (a)

1. has an interest in safety and risk issues in vehicle and transport systems (A1, A2, A3, A7).

d) autonomy and responsibility (o)

1. is capable of collaborating in a team in algorithm development and modelling tasks and of making independent decisions, during decisions respects the ethics and the sustainability (O4).

24. Midterm assessments

oouc	grade	Assessed learning outcomes			
1. ZH1	1. 20%	1. t1,t2,t3,k1,k2,k3,a1,o1			
2. ZH2	2. 20%	2. t1,t2,t3,k1,k2,k3,a1,o1			
3. ZH3	3. 20%	3. t1,t2,t3,k1,k2,k3,a1,o1			
4. HF1	4. 20%	4. t1,t2,k1,k2,a1,o1			
5. HF2	5. 20%	5. t3,k3,a1,o1			
Code	Share in final grade	Assessed learning outcomes			
-	-	-			
26. Conditions for obtaining signature / midterm grade					
submission and presentation of the assignments on time, and successful (min. 50%) completion of the midterm tests					
		Good 75-87%			
		Satisfactory 63-74%			
		Pass 50-62%			
tests can be repeated/retaken once in the semester, assignments can be handed in until the end of the make-up week with a penalty fee					
30. Consultation opportunities					
at a time and in a form agreed with the teacher					
31. Validity of the subject datasheet starts from:					
	. ZH1 2 ZH2 5 ZH3 . HF1 5 HF2 Code	grade . ZH1 1. 20% . ZH2 2. 20% . ZH3 3. 20% . HF1 4. 20% . HF2 5. 20% Code Share in final grade - - and successful (min. 50%)			

Faculty of Tran	Faculty of Transportation Engineering and Vehicle Engineering Subject datash					ect datasheet
1. Subject name	. Subject name Transport automation project					
2 in Hungarian	Közlekedésautom	Közlekedésautomatizálási projektfeladat 3. Programme code				
4. Subject code					5. Term role	2/1 sp
6. Credits	3	7. Evaluation type m			8. Form	with contact hours
9. Weekly contact hours	0 lecture	2 practic	e	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	4 QUALITY 8	DECENT WORK AND ECONOMIC GROWTH	H 9 INDUSTRY, INNO	vation 11 sustainable cities		
12. Working hours for fulfil	ling the requireme	nts of the	subject			90 hours
Contact hours	28 hours	Preparat seminars	ion for	8 hours	Homework	44 hours
Reading written materials	10 hours	Midterm t	est on	0 hours	Exam preparation	0 hours
13. Organisational unit in charge	Department of Co	ntrol for Tra	ansport and V	/ehicle Systems		
14. Subject coordinator	Dr. Bartha Tamás			15. Email address	bartha.tamas@kjk.bme	e.hu
16department	Department of Cor	ntrol for Tra	ansportation	and Vehicle Systems	3	
17. Lecturers	Dr. Bartha Tamás,	Dr. Tettan	nanti Tamás,	Lövétei István Ferer	nc, Farkas Balázs	
18. Indicative prerequisites	8. Indicative prerequisites					
19. Aim of the subject						
Development an independen	t project task related	d to the des	sign of transp	oort automation syste	ems.	
20. Thematics of lectures						
-						
21. Thematics of practices						
During the course, students a semester. The topics related	are given an individu to the design task a	ial design t ire elaborat	ask to solve ted.	independently and d	emonstrate the results at	the end of the
22. Thematics of laboratori	es					
-						
23. Subject learning outcor	nes (lowercase let	ters) and t	heir connec	tion to programme	level learning outcome	s (capital letters)
The student						
 a) knowledge (t) 1. knows the objectives and tasks of traffic automation project assignments (T10) 2. knows the general formulation and structure of the project assignments in the field of transport automation (T10) b) skills (k) 						
 can break down a project task into elements based on specification, can design a development process, can track and document a development process c) attitude (a) 						
1. is open to independently carry out development tasks						
d) autonomy and responsibility (o) 1. can make responsible decisions in a development project						
24. Midterm assessments						
Name		(Code	Share in final grade	Assessed learning ou	utcomes
1. individual project assignme	ent		1. F	1.85%	1. t1,t2,k1,k2,k3,a1,o1	
25. Exam assessments		4	<u>∠.</u> F	2. 13/0		
Name		(Code	Share in final grade	Assessed learning ou	utcomes

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26. Conditions for obtaining signal	27. Final grade in percentage of performance				
The completed and documented wor semester.	Excellent 88-100%				
28. Attendance and participation re	Good 75-87%				
according to the rules of CoS	Satisfactory 63-74%				
29. Late completion opportunities	Pass 50-62%				
the individual project assignment can delayed completion week with a pena	be handed and presented in until t alty fee	he end of the	Fail 0-49%		
30. Consultation opportunities					
at a time and in a form agreed with th	e teacher				
31. Validity of the subject datasheet starts from:					
01 September, 2025					

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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering					
1. Subject name	Transport	economics M	l		
2 in Hungarian	Közlekedésgazda	aságtan M		3. Programme code	К
4. Subject code				5. Term role	1/2 k
6. Credits	4	7. Evaluation type	e	8. Form	with contact hours
9. Weekly contact hours	1 lecture	1 practice	0 laboratory	10. Language	English
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	3 GOOD HEALTH AND WELL-BEING	B DECENT WORK AND ECONOMIC GROWTH DIAD INFRASTRUE	ATION 11 SUSTAINABLE CITIES	13 CLIMATE	
12. Working hours for fulfi	lling the requireme	ents of the subject			120 hours
Contact hours	28 hours	Preparation for seminars	6 hours	Homework	20 hours
Reading written materials	26 hours	Midterm test preparation	20 hours	Exam preparation	20 hours
13. Organisational unit in charge	Department of Tra	ansport Technology and	Economics		
14. Subject coordinator	Dr. Mészáros Fer	renc	15. Email address	meszaros.ferenc@kjk	.bme.hu
16department	Department of Tra	ansport Technology and	Economics		
17. Lecturers	Dr. Mészáros Fer	renc			
18. Indicative	,				
prerequisites	, 				
19 Aim of the subject					
Inderstanding the wider each	nomic contaxt of th	o transport system and i	te sub soctors		
20 Thematics of lectures		ic transport system and t	13 300-3001013.		
The emergence and evolution of modern transport systems. The transport strategy planning process. Transport policy in the European Union and Hungary. Efficiency assessment methods and their applications in transport. Interrelationships between economic, environmental and social sustainability objectives of transport and their modelling possibilities. Economic principles of sustainable mobility, price reform. Evaluation and pricing of the external impacts of transport, using road transport and public transport as examples. Specific economic and social issues of urban transport: information economics, parking management, transport development and land use interrelations.					cy in the European conomic, of sustainable nsport as examples. elopment and land
21. Thematics of practices	i				
Elaboration of sub-tasks rela presentation, individual cons	ated to cost-benefit a sultation to prepare	analysis (CBA) (traffic for a seminar report consisti	ecasting, elasticity ng of sub-tasks.	calculation, efficiency as	sessment) and
22. Thematics of laborator	ies				
23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)					
 a) knowledge (t) 1. identify tools for evaluating the effectiveness of transport improvements (T3,T7) 2. identify the main objectives of transport policy and strategy and the means of implementation (T2,T9) 3. selects economic criteria for evaluating sustainable transport solutions, knows the basic tools of pricing and tariff policy, groups economic aspects of transport information exploitation (T8) b) skills (k) 1. analyse and evaluate the main problems of the transport system (K4) 2. select and apply the most effective assessment methods for sustainability (K2,K10) 3. propose and communicate the most effective transport planning option (K9,K11,K13) c) attitude (a) 					
 strives for completeness i towards members of his/her is open to new and innova sustainability (A1,A4,A6) autonomy and responsi 	n the acquisition of team (A2,A9,A10) ative ideas and rese bility (o)	knowledge, cooperates v earch, is self-critical of the	vith the teacher and tasks assigned to	l fellow students, is empa him/her, and takes full re	athetic and tolerant

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1. in addition to narrow professional criteria, ensures sustainability in the use of his/her knowledge, is able to self-monitor and correct errors independently, while taking into account the professional opinion of others (O3,O4)					
2. makes responsible decisions in his/her chos solve the challenges identified (O2)	en field of competence	on economic issues	and formulates independent proposals to		
24. Midterm assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. midterm test (self-learning)	1. ZH1	1. 17,5%	1. t1,t2,k1,k2		
2. midterm test (lectures)	2. ZH2	2. 17,5%	2. t3,k2		
3. cost-benefit analysis task	3. F	3. 20%	3. a2,01,02		
4. classroom activity	4. A	4. 10%	4. a'i		
25. Exam assessments					
Name	Code	Share in final grade	Assessed learning outcomes		
1. oral exam	1. V	1. 35%	1. t1,t2,t3,k1,k2,k3,a2,o1,o2		
26. Conditions for obtaining signature / mid	27. Final grade in percentage of performance				
submission and presentation of task on time ar midterm tests	Excellent 88-100%				
28. Attendance and participation requireme	nts		Good 75-87%		
according to the rules of CoS			Satisfactory 63-74%		
29. Late completion opportunities			Pass 50-62%		
The midterm tests retake can be repeated, the end of delayed completion period.	Fail 0-49%				
30. Consultation opportunities					
at a time and in a form agreed with the teacher					
31. Validity of the subject datasheet starts f	rom:				
01 September, 2025					

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering								
1. Subject name	Transport informatics							
2 in Hungarian	Közlekedési infor	matika	3. Programme code	К				
4. Subject code				5. Term role	2/1 k			
6. Credits	5	7. Evaluation type	е	8. Form	with contact hours			
9. Weekly contact hours	2 lecture	0 practice	2 laboratory	10. Language	English			
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	3 GOOD HEALTH AND WELL-BEING	1 QUALITY 9 INDUSTRY, INNOV 2 EDUCATION 9 AND INFRASTRUC	ATTON 11 SUSTAINABLE CITIES	17 PARTNERSHIPS FOR THE GOALS				
12. Working hours for fulfi	lling the requirem	ents of the subject	-		150 hours			
Contact hours	56 hours	Preparation for seminars	15 hours	Homework	34 hours			
Reading written materials	20 hours	Midterm test preparation	15 hours	Exam preparation	10 hours			
13. Organisational unit in charge	Department of Tr	Department of Transport Technology and Economics						
14. Subject coordinator	Dr. Csiszár Csab	Dr. Csiszár Csaba 15. Ema address		csiszar.csaba@kjk.bme.hu				
16department	Department of Tr	ansport Technology and	Economics					
17. Lecturers	Dr. Csiszár Csab	Dr. Csiszár Csaba, Dr. Csonka Bálint, Dr. Földes Dávid						
prerequisites Image: Second Secon								
22. Thematics of laboratories								
Basic knowledge of system and service design, examples, case studies. During the independent development of a chosen innovative transport system and service concept, mastering analysis, evaluation, modeling and design methods. Presentation of one's own results. Learning and mastering the characteristics of the most important transport databases, learning and mastering data visualization techniques. Learning the basics and relationships of data science. Learning the characteristics of transport organizations and current IT developments with the help of sub-sector guest speakers.								
23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)								
The student a) knowledge (t) 1. Knows and understands the methodology and tools of the 2. Knows and understands the (T5)	he properties and a eir design and resea he use of informatio	pplication areas of solutio arch. (T3,T7) on and communication tee	ons used in the field	l of transport and transpor o the field of transport and	tation; the transportation.			

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b) skills (k)								
1. Able to process and systematize information collected during the implementation of transport and transportation systems and processes, analyze, draw conclusions and explore relationships, and further develop information systems. (K3,K4,K10)								
2. Able to apply integrated knowledge of transport and transportation processes, vehicles implementing processes, process theory, and related fields of informatics. (K6)								
3. Able to creatively solve problems in the field of transport and to flexibly solve complex tasks using innovative ideas. (K7,K14)								
 Able to conduct publication activities and negotiations in their field of expertise in their native language and at least one foreign language. (K13) 								
c) attitude (a)								
 Open and receptive to learning about and accepting professional, technological development and innovation in the field of transportation, and authentically conveying it. (A1,A2) 								
2. Strives to contribute to the developm	2. Strives to contribute to the development of new methods and tools related to transport and transportation. (A3,A4)							
3. Strives to carry out his/her work based on a systems and process-oriented way of thinking, in a complex approach. (A7)								
d) autonomy and responsibility (o)								
1. Makes decisions carefully, in consultation with representatives of other fields of expertise (primarily legal, economic, energy and environmental protection), independently and with full responsibility. (O2)								
24. Midterm assessments								
Name	С	ode	Share in final grade	Assessed learnin	ig outcomes			
 midterm test midterm test mobility system and service develop assignment mobility system and service develop assignment - presentation of results 	ment home 1. 3. ment home 4.	. ZH_1 . ZH_2 . HF . HF_B	1. 17,5% 2. 17,5% 3. 10% 4. 5%	1. t1,t2,k2,a1,a3 2. t1,t2,k2,a1,a3 3. t1,t2,k1,k3,a1,a 4. k4	2,a3,o1			
25. Exam assessments				<u> </u>				
Name	С	ode	Share in final grade	Assessed learnin	ig outcomes			
1. oral exam	1.	. V	1. 50 %	1. t1,t2,k2,a1,a3				
26. Conditions for obtaining signatu	27. Final grade in performance	percentage of						
'signature' is obtained if all the midterm tests are passed, and the assignment is submitted and accepted, and attendance on guest lectures is completed. Excellent 88-100%								
28. Attendance and participation req	Good 75-87% Satisfactory 63-74%							
According to the rules of CoS. Attendar								
29. Late completion opportunities Pass 50-62%								
Up to one midterm test can be retaken 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 Subject datasheet Faculty of Transportation Engineering and Vehicle Engineering Transport infrastructure management 1. Subject name 2. ... in Hungarian Közlekedési infrastruktúra menedzsment 3. Programme code κ BMEKOKKMsK1C01-00 4. Subject code 5. Term role 2/1 | sp with contact 6. Credits 3 7. Evaluation type m 8. Form hours 9. Weekly contact hours 1 lecture 1 practice 0 laboratory 10. Language English 11. SDG Learning outcomes' [KEPEK:8,9,11,13 contribution to EU/UN **Sustainable Development Goals** 12. Working hours for fulfilling the requirements of the subject 90 hours **Preparation for** Homework **Contact hours** 28 hours 4 hours 12 hours seminars **Reading written Midterm test** 34 hours 12 hours **Exam preparation** 0 hours materials preparation 13. Organisational unit in Department of Transport Technology and Economics charge 15. Email 14. Subject coordinator Dr. Mészáros Ferenc meszaros.ferenc@kjk.bme.hu address 16. ...department Department of Transport Technology and Economics **17. Lecturers** Dr. Mészáros Ferenc - - -, **18. Indicative** - - -, prerequisites - - -19. Aim of the subject Introduction of rules and practice of transport infrastructure development and management. 20. Thematics of lectures Transport infrastructure and corridor policy of the EU and Hungary, network development strategies and transport policy. Infrastructure operation and maintenance strategies, adaptation to climate change. Types of operation contracts, risk management techniques. 21. Thematics of practices Techniques for asset valuation and registration of transport infrastructure. Asset management methods in practice. Risk assessment and management. Case studies related to transport infrastructure management. 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. is familiar with the EU and Hungary's infrastructure and corridor policy (T2,T9) 2. understands the methods used to evaluate and manage infrastructure efficiently (T3,T8,T10) 3. identify the climate challenges of transport infrastructure (T2) b) skills (k) 1. select and use effective tools for transport infrastructure management (K4,K10,K11) 2. analyse and evaluate the results and impacts of transport infrastructure management (K2,K3,K9) 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 (A9,A10) 2. is open to new and innovative ideas and research, is self-critical of the tasks assigned to him/her, and takes full responsibility for sustainability (A1,A2,A6) d) autonomy and responsibility (o) 1. in addition to narrow professional criteria, ensures sustainability in the use of his/her knowledge, is able to self-monitor and correct errors independently, while taking into account the professional opinion of others (O3,O4)

2. makes responsible decisions in the field of transport infrastructure management in response to open questions and formulates independent proposals to solve identified challenges (O2)

24. Midterm assessments

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Name		Code	Share in final grade	Assessed learning outcomes			
1. midterm test		1. ZH	1. 85%	1. t1, t2, t3, k1,k2,o2			
2. risk assessment task		2. F	2. 15%	2. k2,a1,a2,o1			
25. Exam assessments							
Name		Code	Share in final grade	Assessed learning outcomes			
-		-	-	-			
26. Conditions for obtaining signa		27. Final grade in percentage of performance					
submission and presentation of task midterm test	completion of the	Excellent 88-100% Good 75-87%					
28. Attendance and participation							
according to the rules of CoS	Satisfactory 63-74% Pass 50-62% Fail 0-49%						
29. Late completion opportunities							
second retake or delayed completio							
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							
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BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering							
1. Subject name Transport operation							
2 in Hungarian	Közlekedés üzemtar	1		3. Programme code	К		
4. Subject code	BMEKOKKMsK200	1-00		5. Term role	2/1 k		
6. Credits	5 7	. Evaluation type	e	8. Form	with contact hours		
9. Weekly contact hours	2 lecture 2	2 practice	0 laboratory	10. Language	English		
11. SDG Learning outcomes' contribution to EU/UN Sustainable Development Goals	3 GOOD HEALTH AND WELL-BEING 	USTRY, INNOVATION DINFRASTRUCTURE	es 11 SUSTAINABLE CITIES				
12. Working hours for fulfil	ling the requirements	s of the subject			150 hours		
Contact hours	56 hours	Preparation for seminars	12 hours	Homework	27 hours		
Reading written materials	29 hours	Aidterm test preparation	6 hours	Exam preparation	20 hours		
13. Organisational unit in charge	Department of Trans	port Technology and	Economics				
14. Subject coordinator	Dr. Mándoki Péter		15. Email address	mandoki.peter@kjk.bme.hu			
16department	Department of Railw	ay Vehicles and Veh	icle System Analysis				
17. Lecturers	Dr. Mándoki Péter, K	tózel Miklós, Soltész	Tamás, Aba Attila, Di	r. Lakatos András			
18. Indicative prerequisites	, , 						
19. Aim of the subject							
Mastering a passenger orien	ted design approach tl	hat fully addresses ir	ntermodality and lever	ages teamwork opportun	ities		
20. Thematics of lectures							
Process of planning transport establishment using methodological guides. Structure and Chapters of Feasibility Study and Preliminary Feasibility Study. Fit to the policy, evaluation of projects. Development of project variants, evaluation of variables and variations. Planning principles for bus stations, railway stations, airports. The concept of intermodality, the design and function of intermodal nodes. Establishing transfer connections. Principles and aspects of universal design.							
21. Thematics of practices							
International and domestic, p	ositive and negative e	xamples of intermod	al nodes. Consultation	n related to the design ta	sk.		
22. Thematics of laboratori	es						
-							
23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)							
 The student a) knowledge (t) 1. the student knows and understands the characteristics, fields of application and planning techniques of each transport sub-sector (T3,T4,T5,T7,T9) b) skills (k) 1. ability to deal with creative problems in the field of transport and flexible solutions to complex tasks (K7) 2. knows the planning process of an intermodal node, taking into account its operational aspects (K2,K3,K4,K6,K8,K9,K10,K11) 3. able to work in a group, sharing tasks and managing them over time (K12,K14) c) attitude (a) 1. engages in professional and ethical values related to the technical field (A1,A2,A4,A6,A10) 2. works based on a system-oriented and process-oriented mindset, in a team-work (A6,A7,A8) d) autonomy and responsibility (a) 							
 makes decisions carefully, in consultation with representatives of other fields of expertise, with full responsibility (O2,O4) in the case of team work, also works with a well-defined responsibility (O1,O5) 							
24. Midterm assessments							
Name		Code	Share in final grade	Assessed learning ou	itcomes		

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 Presentation (ILL+ÜT+DET) midterm test Presentation (ÚT+FF) 		1. ILL+ÜT+D ET 2. 1. ZH 3. ÚT+FF	1. 9% 2. 10% 3. 6%	1. t1,k1,k2,k3,a1,a2,o1,o2 2. t1,k2 3. t1,k1,k2,k3,a1,a2,o1,o2	
25. Exam assessments					
Name		Code	Share in final grade	Assessed learning outcomes	
 oral exam, presenting the designed oral exam, defending the designed i 	infrastructure nfrastructure	1. V1 2. V2	1. 30% 2. 45%	1. t1,k1,k2,k3,a1,a2,o1,o2 2. t1,k1,k2,k3,a1,a2,o1,o2	
26. Conditions for obtaining signature / midterm grade				27. Final grade in percentage of performance	
the two presentations and completing					
28. Attendance and participation requirements				excellent 85-100% good 70-84% satisfactory 55-69%	
according to the rules of CoS					
29. Late completion opportunities					
The unsuccessful test can be replaced two times during the delayed completion week. It is also possible to complete or supplement the design tasks until the end of the delayed completion week.				pass 40-54% faile 0-39%	
30. Consultation opportunities					
either on in-class workshops or at a time and form agreed with the lecturers					
31. Validity of the subject datasheet starts from:					
01 September, 2025					

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS Faculty of Transportation Engineering and Vehicle Engineering						
1. Subject name	Transport safety M					
2 in Hungarian	- Közlekedésbiztor	Közlekedésbiztonság M			К	
4. Subject code				5. Term role	2/1 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	3 GOOD HEALTH AND WELL-BEING	QUALITY education 9 AND INFRASTR	VATION JCTURE 11 SUSTAINABLE CITIES	16 PEACE, JUSTICE AND STRONG INSTITUTIONS		
12. Working hours for fulfil	lling the requirem	ents of the subject			120 hours	
Contact hours	42 hours	Preparation for seminars	13 hours	Homework	32 hours	
Reading written materials	13 hours	Midterm test preparation	20 hours	Exam preparation	0 hours	
13. Organisational unit in charge	Department of Tr	ansport Technology and	Economics			
14. Subject coordinator	Dr. Sipos Tibor 15. Email address			sipos.tibor@kjk.bme.h	u	
16department	Department of Tr	ansport Technology and	Economics			
17. Lecturers	Dr. Sipos Tibor, E	Dr. Szabó Zsombor				
18. Indicative prerequisites						
19. Aim of the subject						
The aim of the course is to provide students with comprehensive knowledge of road traffic safety, including the key influencing factors and accident prevention strategies. The course introduces traffic safety indicators and analyzes their trends in Hungary and EU member states. It examines the characteristics of the main actors in road transport—human behavior, vehicles, infrastructure, and regulation— and their impacts on traffic safety. The course also reviews relevant legislation, the principles of designing safe infrastructure, and the use of passive and active safety technologies in vehicles. It addresses the human factors in traffic safety, including driver behavior and modern approaches to driver education. Special attention is given to the unique aspects of pedestrian and bicycle transport.						
20. Thematics of rectures The road safety indicators. Development of road safety indicators in Europe and in Hungary. Characteristics of the traffic actors (human, infrastructure, vehicles and regulation), their impact on road safety. Review of the traffic regulation. Features of secure infrastructure. Features of passive and active vehicle safety systems. Human factors of traffic safety, traffic behaviour. Advanced methods of driver training, best practices. Characteristics of pedestrian and cycling traffic						
21. Thematics of practices						
Statistical analysis of the road accidents by Statistical Centre Office's database. Case studies of road accidents by forensic methods. Measurement of the vehicle's blind spot. Study of driver fitness testing methods. Assignment: study on road safety, written summary and presentation, in a group of 2-3 people.						
22. Thematics of laboratori	es					
- 23. Subject learning outcomes (lowercase letters) and their connection to programme level learning outcomes (capital letters)						
 a) knowledge (t) 1. Understands key traffic sa 2. Has knowledge of the imp 3. Knows the legal framewor 4. Understands the functions b) skills (k) 1. Able to collect, process, al 2. Capable of identifying and 3. Able to apply modern meth 4. Capable of effectively corr c) attitude (a) 1. Open to innovations and do 	fety indicators and act of road users (h k relevant to traffic and applications o nd interpret traffic s evaluating safety-n hods creatively to s municating safety- levelopments in the	their development in Hu numan, vehicle, infrastru safety in both national a f passive and active veh afety data. (K3,K4,K6) related interdependencie olve traffic safety proble related information in bo	ngary and EU meml cture, regulation) on nd EU contexts. (T2 iicle safety systems. es in a systemic cont ms. (K6,K7,K14) th Hungarian and fo 1,A3,A6)	ber states. (T2,T3,T7) traffic safety. (T3,T7,T9) ,T3,T9) (T3,T7) text. (K4,K6,K7) reign languages. (K3,K13	,К14)	

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2. Embraces the professional and ethic	2. Embraces the professional and ethical values related to traffic safety; shows strong professional commitment. (A2,A4,A10)					
3. Strives to enforce sustainability, environmental awareness, and health protection in traffic safety. (A6,A10,A7)						
4. Applies systems thinking and a complex approach in professional activities. (A7,A3,A9)						
d) autonomy and responsibility (o)						
1. Makes well-considered and independent decisions in traffic safety in cooperation with other fields. (O2,O3,O4)						
2. Accepts responsibility for the enviror	mental and social con	nsequences	of traffic safety action	ons. (02,03,04)		
24. Midterm assessments						
Name	Co	ode	Share in final grade	Assessed learning outcomes		
1. midterm test	1	ZH	1. 50%	1. t1,t2,t3,t4,k1,a2,	a4	
2. independent research assignment	2.	F	2. 50%	2. k2,k3,k4,a1,a3,o	01,02	
25. Exam assessments				1		
Name	Co	ode	Share in final grade	Assessed learning	g outcomes	
-	-		-	-		
26. Conditions for obtaining signature / midterm grade				27. Final grade in percentage of performance		
submission and presentation of task on time and successful (min. 50%) completion of the midterm test				Excellent 88-100%		
28. Attendance and participation requirements				Good 75-87% Satisfactory 63-74%		
according to the rules of CoS						
29. Late completion opportunities				Pass 50-62%		
Midterm exam can be retaken until the end of delayed completion period. The study paper cannot be delayed submitted and presented.				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						