2026

Engineering Management BSc

STUDY PROGRAM

UNIVERSITY OF DUNAÚJVÁROS

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Description of the Study Program

Engineering Management BSc	
The higher educational institution responsible for the study program	University of Dunaújváros (Dunaújvárosi Egyetem)
Identification number of the higher educational institution	FI60345
Address	1/A Táncsics Mihály utca, 2400 Dunaújváros, Hungary
Head of the higher educational institution	Dr. habil. István András, Ph.D., Rector
People responsible for the study program	
The institute responsible for the study program	Institute of Social Sciences
Director of the institute (name, scientific degree)	Dr. Adrea Keszi-Szeremlei Ph.D, College Professor
Responsible person for the study program (name, scientific degree)	Dr. habil Mónika Rajcsányi-Molnár Ph.D., College Teacher
Specializations and the person responsible for the specialization (name, scientific degree)	
Logistics specialisation:	Dr. Lajos Veres Ph.D., College Professor
Details of the study program	
Entry requirements	- General Certificate of Education or a certificate of secondary school final exam, that certificate, which is required to start a higher educational study program in the home country of the student, - The mother tongue of a foreign student is qualified as advanced language exam according to the Hungarian regulations.
Level	undergraduate
Qualification	bachelor (BSc)
Description of the qualification in Hungarian	műszaki menedzser
Description of the qualification in English	Engineering Manager
Duration of study	7 semesters (3 and a half year) full-time program

Credit points to be acquired	210
Educational goals of the study program	The objective(s) of the training is to train engineering managers, who have acquired adequate knowledge of natural sciences, engineering, economics and management in order to be able to resolve IT, financial and human resource related problems of products and services in an integrated manner. Furthermore, they must have in-depth knowledge that is adequate to enable them to continue with their studies in the graduate, master level.
Prerequisite(s) of starting a specialization and the way of classification	To take the Logistics specialisation the student must complete the study requirements of the following subjects until the end of semester nr. 4. DUEN-TVV-122 Enterpreneurship. DUEN-TVV-114 Management DUEN-TVV-219 Operations and Quality Management In the semester determined in the curriculum the Logistics specialisation will be started.
Academic prerequisite(s) for starting the internship	Internship can be started in the last semester of the program. The prerequisite for starting the internship is the successful completion of the Thesis 1.-Research Methodology subject and the collection of a minimum of 170 credits. In addition to the Internship (15 credits) and Thesis 2. (0 credits), 2 mandatory and 1 specialization subjects specified in the last semester, the student can complete a maximum of 2 subjects (2*5 credits) (total max. 40 credits).
Work placement/Internship	The professional internship is a practical training organized at a professional workplace in the 7th (last) semester, lasting at least six weeks (240 hours). Credit value: 15 credits
The earliest date and conditions for the acceptance of internship based on work experience	Work experience can be completed in the form of an internship in the last (seventh) semester of the program, in positions and tasks relevant to the field of study. Students must register for the internship course and fulfill the reporting requirements as specified in the Moodle system. The "Completion of professional practice

	through work experience" application must be submitted with the specified documents attached. In order to successfully complete the professional practice course, all specified documents must be prepared and uploaded.
Prerequisitie(s) of issuing the pre-degree certificate (absolutorium)	The university leaving certificate certifies the successful completion of the exam requirements in accordance with the curriculum and the completion of the other study requirements (e.g. physical education) and the collection of the required number of credit points defined in the study and output requirements (except the credit points related to the thesis). This certificate is a proof without qualification and evaluation that the student has fulfilled all the study and exam requirements defined in the curriculum.
Prerequisite(s) for thesis writing	The prerequisite for starting the Thesis 2 – Thesis Writing course is the successful completion of 50% of the Specialization courses and the Thesis 1 – Research Methodology course, and the accumulation of a minimum of 170 credits. In addition to the Professional Practice (20 credits) and Thesis 2 (10 credits) courses specified for the final semester, students may complete a maximum of 2 courses (2*5 credits).
Thesis	The thesis research means the solution of a Engineering management problem or the elaboration of a research task on such a special field, on which it can be completed on the basis of the knowledge acquired by the student during the years of his studies with the guidance of the first and second supervisor in one semester. The candidate proves with writing the thesis that he has adequate expertise in the practical use of the factual knowledge that he has learnt, and that he is able to do the tasks of an engineering business manager and that he is familiar not only with the course material, but with the related special literature, as well, and he is able to apply that in a value-creating way. Formal requirements: the extent of the thesis must be 40 – 60 pages.
Prerequisite(s) of the final exam	The prerequisites of the final exam are the receipt of the university leaving certificate and the thesis accepted for evaluation. The student successfully passed the preliminary

	exam prior to the final exam.
The final exam	The final exam is to check and assess the knowledge, skills and abilities required for the obtaining of a certificate on the study program. Students are also expected to prove their competence in applying the acquired theoretical knowledge in professional practice. The final exam consists of defending the student's thesis and an oral exam on the subjects defined in the curriculum (FE1, FE2)
Subjects of the final exam	- Final Exam Subjects 1 (FE1) (Complex): DUEN-TVV-114 Management DUEN-TVV 111 Human Resource Management DUEN-TVV 216 Management Methods - Final Exam Subjects 2 (FE2) (Green Logistic Specialization): DUEN-TVV-212 Basics of Logistics DUEN-TVV-121 Business Logistics DUEN-TVV-214 Logistics Management DUEN-TVV-110 ESG approach for businesses
Average of the certificate	The diploma result shall be calculated as follows: (ZV1 + ZV2 + D + TA)/4: (ZV1) is the grade for the first final exam subject (ZV2) is the grade for the second final exam subject (D) is the grade for the thesis, which is calculated as follows: -Grade received for the review 1/3 -Presentation 1/3 -Debating skills, answers to questions 1/3 (TA) the weighted grade point average for all credits earned during the entire study period, excluding the thesis (the result must be rounded to two decimal places).
Qualification of the certificate	excellent 4,51 - 5,00 good 3,51 - 4,50 satisfactory 2,51 - 3,50 pass 2,00 - 2,50
Precondition of the issue of certificate	The precondition of the issue of certificate to prove the completion of higher educational studies is the successful final exam.
Preconditions of issuing the certificate	The prerequisite for the issuance of a diploma certifying the completion of higher education

	studies is the successful completion of the final examination and the required language examination. In order to obtain a bachelor's degree, students must pass a state-recognized, intermediate-level (B2) complex language exam in at least one foreign language or obtain an equivalent high school diploma or certificate.
Mobility window	During the program, students should ideally take advantage of the mobility window in the 4th, 5th, and 7th semesters. Since mobility depends both on the capacity of the foreign institution and the student's travel options, we incorporate this window flexibly into the curriculum in accordance with the principles set out in Section 45 of the Student Requirements System Study and Examination Regulations. A designated member of the International Office will assist in the selection of the host institution.
Language of Training	English
Sport	For students participating in full-time training, 2 hours per week are mandatory for a minimum of 4 semesters during the training period.
Study mode	Full time

Required competencies:
The students graduated in Engineering Business Management BSc know
- the basic concepts and major correlations of the area of engineering and management;
- the science, arts and economic and social (inter)connections of production and supplying processes;
- the principles of operation of organisations;
- the engineering, economical and management like activities in organisations and their inter-relations;
- the knowledge necessary for founding and managing the manufacturing and supplying enterprises;
- the principles and usable results of marginal areas of related fields of science (e.g. sociology, psychology) and engineering and management sciences;
- the requirements of environmental protection, safety engineering, quality assurance, industrial-law protection and consumer protection.

The students graduated in Engineering Business Management BSc can and are able
- organise, manage and control technological, production, logistic, quality assurance and information technological processes;
- prepare business plans;

- fulfil decision-preparatory tasks;
- implement innovation strategies;
- manage groups at workplaces;
- manage information;
- fulfil the tasks of human resource management;
- surveying the accountancy system;
- fulfil operational tasks of production management, provide production and supply activities;
- define quality and efficiency indices;
- analyse the competitors, products and the possibilities of bringing products to the market.

The graduates of the course have skills for co-operation and making contacts, communication skills, knowledge of foreign languages, have a sense of responsibility, related to the engineering profession; they are quality conscious, and they have evaluation, self-evaluation, analysing and synthesizing skills.

Curricular Web

Course descriptions of the Engineering Management BSc study program

Engineering Manager BSc.																														
Subject code	Subject name	Credit	Requirement	Semester - Classes per week																										Prerequisite
				1			2			3			4			5			6			7							
				T	P	L	T	P	L	T	P	L	T	P	L	T	P	L	T	P	L	T	P	L						
DUEN-TKK-915	Introduction to the use of artificial intelligence*	0	M	5*	5*	0																								
DUEN-IMA-100	Tutorial Mathematics	0	M	0	2	0																								-
DUEN-IMA-151	Mathematics 1.	5	E	1	2	0																								-
DUEN-MGT-111	Engineering representation	5	M	1	2	0																								-
DUEN-MUT-151	Engineering Physics	5	E	1	1	1																								-
DUEN-TKM-150	Legal Knowledge	5	E	3	0	0																								-
DUEN-TKT-151	Economics 1.	5	E	1	2	0																								-
DUEN-TVV-122	Entrepreneurship	5	M	1	2	0																								-
DUEN-IMA-211	Mathematics 2.	5	M				1	2	0																					DUEN-IMA-151
DUEN-MST-210	Industrial materials	5	M				1	0	2																					-
DUEN-MUT-250	Heat and Fluid Dynamics	5	E				1	1	1																					DUEN-MUT-151
DUEN-TKT-211	General and Business Statistics	5	M				1	0	2																					-
DUEN-ISF-010	Informatics	5	M				0	0	3																					-
DUEN-TVV-220	Business economics	5	M				1	2	0																					-
DUEN-IMA-110	Mathematics 3.	5	M							0	3	0																		DUEN-IMA-151
DUEN-MUA-116	Technology of Structural Materials	5	M							1	0	2																		DUEN-MUA-216
DUEN-MUG-152	Mechanics 1.	5	E							1	2	0																		-
DUEN-MUG-212	CAD	5	M							0	0	3																		-
DUEN-TKT-114	Basic of Finance	5	M							1	2	0																		-
DUEN-TVV-114	Management	5	M							1	2	0																		-
-	Optional course	5	-										-	-	-															-
DUEN-MUG-222	Basics of machine design	5	M										2	1	0															DUEN-MUG-212, DUEN-MUG-152, DUEN-MGT-111
DUEN-MUG-252	Production Technology	5	E										2	1	0															-
DUEN-TVV-215	Marketing	5	M										1	2	0															-
DUEN-TVV-219	Operations and Quality Management	5	M										1	2	0															-
DUEN-TVV-250	Strategic planning	5	E										1	2	0															DUEN-TVV-114
-	Specialization	20	-													-	-	-												-
DUEN-TVV-116	Project Management	5	M													1	2	0												-
DUEN-MGT-112	Engineering construction	5	M													1	2	0												-
-	Specialization	15	-																-	-	-									-
-	Optional course	5	-																-	-	-									-
DUEN-TGT-214	Ergonomics and health promotion	5	M																1	2	0									-
DUEN-TVV-090	Thesis-Research Methodology	0	S																1	0	0									-
DUEN-TKT-217	Principles of Accounting	5	M																1	2	0									-
-	Specialization	20	-																			-	-	-						-
DUEN-MUT-110	Environmental protection and energy management	5	M																			2	0	1						-
DUEN-TVV-111	Human Resource Management	5	M																			1	2	0						-
-	Sport (recommended semester)	0	S																			1	2	0						-
	Number of Theoretical/Practice/Lab classes per week			8	11	1	5	5	8	4	9	5	7	8	0	2	4	0	3	4	0	4	4	1						
	Total number of classes per week			**20**			**18**			**18**			**15**			**6**			**7**			**9**								
	Total credit points			**210**																										
GREEN LOGISTICS																6	6	0	4	3	1	2	2	0						
																12			8			4								
				20			18			18			15			**18**			**15**			**13**								

Note: * total number of hours per semester

GREEN LOGISTICS																										
Subject code	Subject name	Credit	Requirement	Semester - Classes per week																						Prerequisite
				1			2			3			4			5			6			7				
				T	P	L	T	P	L	T	P	L	T	P	L	T	P	L	T	P	L	T	P	L		
DUEN-MGT-153	Basics of energy saving and conservation	5	E													2	1	0								-
DUEN-TGT-110	ESG approach for businesses	5	M													2	1	0								-
DUEN-TVV-119	Analysis of Business Cases	5	M													1	2	0								-
DUEN-TVV-212	Basics of Logistics	5	M													1	2	0								-
DUEN-MGT-216	Novel techniques of environmental protection	5	M																2	0	1					-
DUEN-TVV-120	Enterprise Information Systems	5	M																0	2	0					DUEN-TVV-220, DUEN-ISF-010
DUEN-TVV-214	Logistic Management	5	M																2	1	0					-
DUEN-TVV-121	Business Logistics	5	M																			1	2	0		DUEN-TVV-212
DUEN-TVV-091	Thesis writing MMENBSC	15	S																			1	0	0		DUEN-TVV-090, minimum 170 credits completed
DUEN-TVV-093	Internship MMENBSC	0	S																			0	0	0		DUEN-TVV-090, minimum 170 credits completed
	Number of Theoretical/Practice/Lab classes per week			0	0	0		0	0	0	0	0	0	0	0	6	6	0	4	3	1	2	2	0		
	Total number of classes per week			0			0			0			0			**12**			**8**			**4**				
	Total credit points			**55**																						

Introduction to the use of Artifical Intelligence

Title of the subject	Hungarian			**Bevezetés a mesterséges intelligencia használatába**					Level	compulsory	
	English			**Introduction to the use of artificial intelligence**					Code	DUEN(L) -TKK- 915	
Responsible Academic Unit				Teacher Training Centre							
Compulsory prerequisite subject:				none							
Type		Lecture		Seminar		Lab		Requirements	Credit	Language of instruction	
Full time		Per semester	5	Per semester	5		0	F	**0**	Hungarian	
Part time		Per semester	5	Per semester	5		0				
Person responsible for the subject:				name:		Czifra Sándor			position:	Teaching assistant	
Lecturer:				name:					position:		

Course objectives and justification (content, learning outcomes, place in curriculum)	**Objectives and development goals**	
	The rapid development of artificial intelligence and its integration into everyday life is fundamentally transforming access to knowledge, learning methods, and educational and workplace environments. As a result, there is a growing demand for targeted, short-term training courses that provide comprehensive yet practical knowledge about artificial intelligence. The primary goal of the 10-hour artificial intelligence training course is to provide participants with meaningful, systematic, and applicable knowledge, while laying the foundation for a critical and responsible approach to the technology. The general aim of the training is to provide participants with a comprehensive overview of the basic concepts, operating principles, and key areas of application of artificial intelligence, and to enable them to use AI tools in a conscious and goal-oriented manner in their own learning or professional environment. The training does not aim to impart in-depth technical or programming knowledge but rather to develop participants' competencies based on the three pillars of understanding, applicability and reflection. The training also aims to help students understand the basic principles of AI including the role of data and how algorithms work. The training includes a brief overview of the historical development of AI, which helps students understand the current state of technology and future possibilities. The 10-hour time frame provides participants with the opportunity to gain practical experience in using simple, widely available AI-based tools. Within this framework the aim of the training is to teach participants the principles of effective instruction i.e. prompting and to enable them to use these tools for various purposes such as information retrieval and content creation. Another important goal is for participants to be able to critically evaluate AI-generated content, recognizing its inaccuracies, biases and limitations. One of the main goals of artificial intelligence education is to encourage participants to adopt an open yet critical approach to AI technologies. The training helps participants become aware of the role of human decision-making, creativity and responsibility in the use of AI. A key objective is to provide a basic understanding of ethical, legal and data protection issues, with a particular focus on their application in an educational environment.	
Typical lesson types:	Lecture	For all students, in a large lecture hall, blackboard presentation, projector or online using MS Teams
	Seminar	By providing access to appropriate IT equipment and web-based AI tools in the computer room.
	Lab	

	Other
Requirements (in learning outcomes)	**Knowledge** • During the lectures students will learn about artificial intelligence, its basic concepts, and theoretical frameworks. • The lectures will cover the basic principles of artificial intelligence and its main areas of application. • In order to apply new technologies, they will understand and comprehend the data protection, ethical, and social implications of using artificial intelligence-based systems and learn about the factors that influence the reliability of AI systems.
	Skills • After completing the training, participants will be able to consciously use simple AI-based tools (e.g. text, image or presentation generators), create and apply well-formulated prompts for their purposes. • They will recognize the advantages and limitations of using AI. • In line with conscious application students will be able to critically evaluate AI-generated content, integrate it into learning or teaching processes, and design application scenarios in their own areas of interest and expertise.
	Attitude • The training helps participants become open to learning about and trying out AI-based solutions, while also recognizing whether a given problem is suitable for an AI solution. • After completing the course students will be able to critically evaluate information obtained through AI and use AI tools responsibly and ethically. • They will strive for continuous professional development and keep up with the latest AI innovations, recognizing the importance of lifelong learning in the long term.
	Autonomy and responsibility • The student is able to independently select and apply AI tools when solving a given problem. • They take responsibility for the accuracy, reliability and ethical use of the outputs they produce. • They recognize their own limits of competence in AI-based analysis tasks.
Short description of subject content	The aim of the 10-hour artificial intelligence (AI) training course is to provide participants with a comprehensive yet practical overview of the basic concepts, operating principles and potential applications of AI. The introductory section of the course clarifies the concept of artificial intelligence and current technological trends. After that, the focus gradually shifts to practical applications. Students learn about generative AI tools (such as text, image and study material generation). An important part of the course is discussing ethical, legal and data protection issues, with a special focus on responsible AI use in education. By the end of the course participants will be able to use AI-based tools critically and reflectively, recognize their pedagogical added value and make informed decisions about their application. The 10-hour course does not provide in-depth programming knowledge, but develops digital and pedagogical competencies that lay the foundation for the informed, responsible, and effective use of AI.
Forms of student activity	Assessment of listening comprehension with note-taking – 50% Individual practical assignments – 50%
Required reading and resources	• National AI Strategy (Hungary) • AI-MI-tools: Elicit, Scite.ai, ChatGPT, Consensus, ScholarAI, Semantic Scholar, ResearchRabbit
Recommended reading and resources	• UNESCO (2023): *AI in Science and Research Ethics Guidelines* • OECD (2024): *Responsible AI for Research and Innovation* • Elsevier & Springer AI policy for authors • Peter Norvig, Stuart J. Russell: Artificial Intelligence Volume I – A Modern Approach

	• Malcolm Show-Enczi Zoltán: Artificial Intelligence for beginners – Learn how artificial intelligence can be your best colleague and helper! • Stuart J. Russell: Artificial Intelligence: A Modern Approach • Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson. • Alpaydin, E. (2020). *Introduction to Machine Learning* (4th ed.). MIT Press. • Mitchell, T. M. (1997). *Machine Learning.* McGraw-Hill. • Christian, B. (2020). *The Alignment Problem: Machine Learning and Human Values.* Norton & Company.
Assignments	Preparation of individual project tasks/case studies using AI-based tools in line with the number of measurement points specified in the TVR.
Description and schedule of exams	There is no midterm test.
Framework and rules for the use of artificial intelligence	Given the nature of the course content the use of artificial intelligence is permitted in all situations.

Tutorial Mathematics

Title of the subject	Hungarian			**Matematika felzárkóztató**					Level	compulsory	
	English			**Tutorialmathematics**					Code	DUEN(L)-IMA-100	
Responsible Academic Unit				Institute of Informatics							
Compulsory prerequisite subject:				none							
Type		Lecture		Seminar		Lab		Requirements	Credit	Language of instruction	
Full time		Per semester	0	Per semester	2		0	A	**0**	Hungarian	
Part time		Per semester	0	Per semester	10		0				
Person responsible for the subject:				name:		Dr. Gordana Stankov			position:	Assistant Professor	
Lecturer:				name:					position:		

Course objectives and justification (content, learning outcomes, place in curriculum)	**Objectives and development goals** This course is recommended, based on a preliminary assessment of prior knowledge, for students enrolled in the Bachelor's programmes in Business Administration and Management, Materials Engineering, Mechanical Engineering, Business Informatics, Computer Engineering, and Technical Management, as well as in higher-level vocational programmes in technical and business-related fields. The primary objective of the course is to provide students with the fundamental mathematical knowledge required for higher education studies. It aims to strengthen and systematize students' mathematical knowledge, skills, and competencies in order to establish an appropriate foundation for successfully completing university-level mathematics courses. The course builds on the mathematical knowledge acquired in secondary education.	
Typical lesson types:	Lecture	-
	Seminar	Classroom exercises, structured student contribution, presentation, case study analysis.
	Lab	-
	Other	-
Requirements (in learning outcomes)	**Knowledge** • The student has knowledge of the methods and procedures necessary for solving mathematical problems related to their field of study. They possess the fundamental mathematical background required for their discipline, including knowledge of functions and linear algebra.	
	Skills • The student is able to apply the acquired mathematical knowledge and related activities in practice. • They apply the learned problem-solving methods and procedures in solving mathematical tasks. • They are able to develop their own solution strategies and defend them in discussions by using appropriate mathematical reasoning and argumentation. • They are capable of organizing their own learning process effectively and of identifying and using various learning resources (printed and electronic).	
	Attitude • The student is open to understanding and adopting developments and innovations in mathematics and applied mathematics related to their qualification and field of study. • They show interest in new methods and tools relevant to their discipline. Their attitude towards solving technical problems is strengthened and further developed.	
	Autonomy and responsibility • Students take responsibility for their own work.	
Short description of subject content	The course covers the content of the intermediate-level mathematics matriculation exam.	

	Operations with complex numbers. Set theory concepts and the notion of functions. Number sequences, exponentiation, root extraction, and order of operations. Logarithms, solutions of linear and quadratic equations. Solving word problems.
Forms of student activity	Guided problem-solving: 60% Independent problem-solving: 40%
Required reading and resources	• OpenStax. (2021). *Precalculus 2e.* Houston, TX: OpenStax. ISBN 978-1-951693-40-4. • Abramson, J. (Ed.). (2021). *Algebra and Trigonometry 2e.* Houston, TX: OpenStax. ISBN 978-1-951693-40-4.
Recommended reading and resources	• OpenStax. (2021). *College Algebra (2e).* Houston, TX: OpenStax. ISBN 978-1-951693-41-1. • OpenStax. (2022). *Contemporary Mathematics.* Houston, TX: OpenStax. ISBN 978-1-951693-56-5.
Assignments	-
Description and schedule of exams	During the semester, full-time and part-time students will take one midterm test in week 13. Students who achieve at least 50% on the midterm will receive a graded signature.
Framework and rules for the use of artificial intelligence	Artificial intelligence may be used during classwork; however, it is not permitted for solving tests.

Mathematics 1.

Title of the subject		Hungarian	**Matematika 1**						Level	compulsory	
		English	**Mathematics 1**						Code	**DUEN(L)-IMA-151**	
2026/27/1											
Responsible Educational Institute			**Informatics Institute**								
Prerequisites											
Type		Weekly contact hours						Requirement	Credits	Language	
		Lecturers		Practice sessions		Labs					
Full time	**150/39**		**1**		**2**		**0**	**Exam**	**5**	**English**	
Part time	**150/15**	Semester	**5**	Semester	**10**	Semester	**0**				
Course cordinator				Name		**Dr. Antal Joós**			Position	**Associate Professor**	
Course objectives and justification (content, learning outcomes, place in curriculum)				**Objectives and development goals** Acquiring the mathematical foundations necessary for further studies.							
				Training background, development objectives Training background: knowledge and skills acquired in public education. Related subjects: Engineering Mathematics 2, Mathematics 3, Operations Research and Decision Theory. Related objectives: learning the concepts and relationships of linear algebra, probability theory, and statistics that are essential for working in the field.						
Typical lesson types:				Lecture							
				Seminar	Classroom practice, student-written posts, presentations, case study analysis						
				Lab							
				Other							
Requirements (in learning outcomes)				**Knowledge** • Knows the methods and procedures necessary for solving mathematical problems in their field of expertise. • Possesses the knowledge and skills in mathematics, function theory, and linear algebra necessary for their field of expertise.							
				Skills • Is able to apply the mathematical knowledge and skills they have learned. • Applies the problem-solving methods and procedures learned. • Is able to prepare their own solution plan and defend it in discussions (argumentative debate skills) in relation to the mathematical concepts learned. • Is able to organize their own learning process effectively, find and use various learning resources (printed, electronic).						
				Attitude • Is open to learning about and accepting mathematics-based, applied mathematical developments and innovations related to their qualification and field of expertise. • Is interested in new methods and tools related to their field of expertise.						
				Autonomy and responsibility • Responsibility for their own work and that of their colleagues.							
Short description of subject content				Linear equation systems. Matrices, operations with matrices. Matrix determinant, inverse, rank. Vectors, operations with vectors. Basis transformation. Space elements, metric tasks. Eigenvalues, eigenvectors.							

	Operations with complex numbers. Set theory, the concept of a function. Limits of sequences, convergence criteria. Basic properties of single-variable real functions, limits, continuity. Interpretation of the differential quotient of single-variable real functions, the relationship between differentiability and continuity, the derivative function, the differential of a differentiable function. General differentiation rules, differentiation of elementary functions. Mean value theorems of differential calculus, higher-order derivatives, L'Hospital's rule, function discussion. The concept of the Riemann integral, conditions for integrability, properties of definite integrals, mean value theorem of integral calculus, Newton-Leibniz formula. Primitive functions, indefinite integrals and some of their properties, basic integrals. Integration methods. Improper integrals. Basic properties of real functions of several variables, differential calculus, calculation of extreme values. Tasks related to nuclear energy and green energy.
Forms of student activity	Learning theoretical material with guidance and independently. Solving tasks with guidance and independently. Learning theoretical material with guidance: 10% Learning theoretical material independently: 30% Solving tasks with guidance: 30% Solving tasks independently: 30%
Compulsory literature	1] Lay, D. C.: Linear Algebra and its applications, 4th edition, Addison-Wesley, 2012. [2] Stewart, J.: Complex Numbers, Additional Topic to Essential Calculus, 2nd edition, 2013, pp. 1-11. [3] Smith, R. T., Minton, R. B.: Calculus: Early transcendental functions, 4th edition, McGraw Hill, New York, 2012.
Recommended literature	
Assignments	As stated in the first lesson.
Description and schedule of exams	As stated in the first lesson.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted. Artificial intelligence is permitted for checking homework assignments, accelerating the learning process, and generating sample examples to facilitate understanding of concepts, but its use is prohibited in closed-book exams.

Engineering description

Subject name		In Hungarian		Műszaki ábrázolás				Level		BSc	
		In English		Engineering description				Code		DUEN(L)-MGT-111	
Responsible educational unit				Institute of Engineering							
Compulsory prerequisite subject:											
Type		Number of lessons						Requirement		Credit	Language of education
		Lecture		Seminar		Lab					
Full time	150/60	Per week	2	Per week	1	Per week	0	F		5	English
Part time	150/15	Per semester	10	Per semester	5	Per semester	0				
Person responsible for the subject:				name		Dr. Gábor Vizi				position	college associate professor

Course objectives and justification (content, learning outcomes, place in curriculum)	Short-term objective To impart the knowledge of descriptive geometry and mechanical drawing necessary for performing mechanical engineering work.	
	Objectives and development goals The student should be able to perform any variation of the basic constructions occurring in representational geometry. Recognize the elementary constructions necessary for solving various complex tasks, be able to determine their appropriate sequence. Be able to select the optimal solution for the given situation from among the possible solution methods. The student should know the theory and practice of creating technical drawing projections and sections. The student should be able to edit technical drawings of machine parts with traditional tools and read technical drawings. The student should be able to build a dimensional network of machine parts.	
Typical delivery methods	Lecture	Transferring theoretical knowledge through presentation
	Seminar	Solving typical tasks with teacher guidance
	Lab	-
	Other	-
Requirements (in learning outcomes)	Knowledge • He/She knows the conceptual system, the most important relationships and theories related to his/her field of expertise. • He/She has a comprehensive knowledge of the knowledge acquisition and problem-solving methods of the main theories of his/her field of expertise. • He/She has a basic knowledge of machine design principles and methods, machine manufacturing technology, control engineering procedures and operating processes. • He/She has a comprehensive knowledge of the operating principles and structural units of applied work and power machines, mechanical equipment and devices. • He/She can interpret, characterize and model the structure and operation of the structural units and elements of mechanical systems, the design and relationship of the applied system elements.	
	Ability • Performs a job that is appropriate to his/her professional qualifications. • Able to plan, organize and carry out independent learning. • Able to identify routine professional problems, explore, formulate and solve (through the practical application of standard operations) the theoretical and practical background necessary for their solution.	

	Attitude • Open to learning about and embracing machine design developments related to their qualifications and field of expertise. • Interested in new methods and tools related to their field of expertise.
	Autonomy and responsibility • Taking responsibility for one's own work and the work of others.
Short description of subject content	Image plane, coordinate system, projection. Representation of a point, real and point image of a line. Projection and the law of change of view. Mutual positions of spatial elements. Projections depending on their straight positions, diverging and intersecting lines. Transversals, notable lines of a plane. True size of a plane figure, constructions with rotation. Intersection line of two planes, angles of inclination, distances. Solving problems with basic constructions. Basic standards of technical drawing design. Theoretical overview of projection systems in technical practice. Application of views, view orders. Application of sections and sections. Dimensioning on technical drawings. Dimension grids.
Types of student activity	Processing theoretical material with guidance 20% Independent processing of theoretical material 20% Solving tasks with guidance 20% Independent processing of tasks 40% Laboratory measurements with guidance – Preparation of laboratory reports -
Required reading and resources	• Tamás Zahola: Descriptive Geometry – Elementary constructions • Tamás Zahola: Introduction to Engineering Drawings
Recommended reading and resources	
Assignments	Standard characters Creation of a new view Diverting and intersecting lines Plane notable lines Interaction of plane shapes Constructions Projections Sections
Description and schedule of exams	Week 7: Complex Representational Geometric Editing Week 13: Mechanical Engineering Review Questions
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is permitted when solving editing tasks, and it is the student's responsibility to check the correctness of the solution. No external assistance is allowed during closed assignments.

Engineering Physics

Subject name		In Hungarian	**Mérnöki fizika**						Level	BSc	
		In English	**Engineering physics**						Code	**DUEN(L)-MUT-151**	
2125/26 I.											
Responsible educational unit			**Intstitute of Engineering Sciences**								
Compulsory prerequisite subject:			-								
Type		Number of lessons							Requirement	Credit	Language of education
		Lecture		Seminar		Lab					
Full time		Per week	**1**	Per week	**1**	Per week	**1**		**V**	**5**	**english**
Part time		Per semester	**5**	Per semester	**5**	Per semester	**5**				
Person responsible for the subject:			name			**dr. Horváth Miklós**			position	**associate professor**	

Course objectives and justification (content, learning outcomes, place in curriculum)	**Short-term objective** The goal of the course is to learn the basics of the mechanics of a particle, mechanival systems, electricity, statics and dynamics of liquids and gases, thermodynamics, and geometric and physical optics, and to prepare for the specialized subjects following the module.	
	Objectives and development goals The subject is a basic subject, and accordingly it is included in the first semester of the first year in the curriculum. The subject background is the core material of the secondary school physics. The goal of the subject is to understand and learn the fundamental laws of classical physics at a higher level than in the secondary school, using the differential and integral calculus at the level of description and definitions. The aim is to learn and understand physical laws and phenomena during the lectures, and to solve physics problems during the problem solving exercises. The additional goal is to learn how to measure basic physical quantities and measurement methods, to learn about the measuring instruments belonging to them, and to master their use. Upon successful completion of the subject, students will increase their scientific literacy, develop their problem-solving and manual skills. The knowledge of the subject prepares them for the understanding and learn of later professional subjects.	
Typical delivery methods	Lecture	projector
	Seminar	projector and board
	Lab	laboratory exercises in he physics laboratory
	Other	-
Requirements (in learning outcomes)	**Knowledge** • Possesses theoretical and practical knowledge related to the subject area. Recognizes and understands the physical basics of problems in technical practice, is able to use basic physical measuring instruments	
	Ability • Able to perform tasks related to the subject area. Has high-level problem-solving skills.	
	Attitude • The attitude of solving technical problems develops	
	Autonomy and responsibility • Taking responsibility for the work	

Short description of subject content	Mechanics: basic kinematics, rectilinear uniform, and accelerating motion, uniform and accelerating circular motion. Dynamics: basic equation of dynamics, uniform accelerating motion, dynamics of circular motion, oscillatory motion. Linear momentum of a particle and mechanical system, theorem of linear momentum, work energy, power. Mechanics of fluids and gases. Hydrostatics, Archimedes' law, Pascal's law Thermodynamics: 1st and 2nd laws of thermodynamics, cycles, phase changing, linear and volume heat expansion. Electricity: electrostatics, direct current, direct current network analysis Magnetism and induction, alternating current Optics: geometric optics, physical optics, photometry
Types of student activity	Understand and processing the heard presentation by taking notes 50% Problem-guided systematization of information 30% Independent processing of problems 20%
Required reading and resources	Dr. Kiss Endre: Textual material based on the Engineering Physics textbook in the Moodle system Department working group; edited by Dr. Horváth Miklós: Elaborated tasks based on the Physics example library in the Moodle system Syllabuses of Engineering Physics laboratory exercises in the Moodle system Literature: Alvin Halpern: Beginning Physics I-II (SHAUM OUTLINE SERIES McGraw- Hill, ISBN 0-07-025653-5)
Recommended reading and resources	Daniel Oman- Robert Oman: Physics for the Utterly Confused (McGraw- Hill Companies, ISBN: 0-07-048262-4) Daniel Oman- Robert Oman: How to solve Physics Problems (McGraw- Hill Companies, ISBN: 0-07-0481660)
Assignments	explained in the 1st lecture
Description and schedule of exams	explained in the 1st lecture
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is permitted for preparing for a paper or exam. In case of working from home, (preparing assignments to be submitted), the use of artificial intelligence-based tools is permitted for language and form correction, information collection, and systematization, provided that the student indicates the use and checks the results. In these cases, the responsibility for the submitted work is the student's responsibility. The use of artificial intelligence in all activities during assessments (written and oral assessments) is prohibited: In the first lesson the teacher must provide a detailed information about these rules.

Legal knowledge

Subject name	In Hungarian	Jogi alapismeretek					Szintje	A	
	In English	Legal Knowledge					Level	A	
Subject code		DUEN-TKM-150							
Responsible educational unit		Institute for Social Sciences Department of Organisation Development and Communication Sciences							
Name of Mandatory Preliminary Study		-							
Number of Lessons							Requirements	Credits (ECTS)	Language of Education
	Theoretical		Practice		Lab				
Full-time	3	3		0		0	Exam	5	English
Correspondence				0		0			
Teacher responsible for the course	Name		Dr. habil. Orsolya Fruzsina Falus				Position	assoc. prof.	
Educational goals	The goal of the course is to introduce the terminology of law and the rule of law in Hungary, in the European Union and from an international perspective, as well. Students will learn the principals of the Fundamental Law and the basics of public administration in Hungary, in the EU and the countries of the international community. They should be able to understand laws and apply the principle rules regulating business life. Students understand corruption as a criminal law concept, and know its forms, the United Nations Convention against Corruption, the EU anti-fraud policy, the OLAF (European Anti-Fraud Office) and its investigative powers. They are familiar with the policies aiming at the prevention of corruption.								
Typical delivery methods	Theoretical	In a classroom with the use of projector or computer in each lecture.							
	Practice	-							
	Lab	-							
Requirements	**Knowledge** • Knows the basics of the legal branches related to his/her field of expertise; • Is aware of the basic principles and methods for establishing organizations and institutions, developing and changing their structure and organizational behavior. Has legal knowledge regarding the establishment and operation of small and medium-sized enterprises. • Has knowledge regarding the regulation of corruption crimes that frequently occur in his/her field of expertise, the legal norms established for their prevention, as well as international and European conventions and the institutional system.								
	Ability • Follows and interprets changes in relevant legislation and their effects in the field, and takes these into account in his/her analyses, proposals and decisions; • Is capable of substantive professional cooperation with lawyers working in his/her field; • Knows and correctly applies legal terminology related to his/her field in English; • Recognizes situations suspected of corruption and consciously applies the relevant legislation in force in order to avoid and prevent them.								
	Attitude • Open to changes in the broader legal environment of the given job, work organization, and enterprise, and strives to follow and understand the changes; • Acceptable to the opinions of others, to sectoral, regional, national, and European values; • Convincedly defends the enforcement of human rights in their work; • Follows and interprets changes in domestic, EU, and International Legal norms. Within this, they pay special attention to following and complying with changes in social, environmental, and ecological-sustainability legal sources.								
	Autonomy and responsibility • Takes responsibility for complying with legal and ethical norms and rules related to work and behaviour; • Using his/her knowledge of Contractual Law and Company Law, he independently leads, organizes and manages an organizational unit, work group,								

	or enterprise, a smaller economic organization in a business organization, taking responsibility for the organization and its employees; • Based on his/her basic legal knowledge covering several branches of law, he/she performs the tasks assigned to him as a member of projects, group work, and organizational units independently and with legal responsibility.
Brief description of the subject content	The definition of Law and the Rule of Law. The system of legal sources. Human rights. The Fundamental Law of Hungary. The National Assembly and the national referendum. Legal competency - legal capacity and forms of representation. Legal entity. Establishment and termination of firms. Contracts. Introduction to criminal law. International law and EU law. Legal case studies. • Corruption: 1. Corruption as a criminal law concept. 2. Corruption offences. 3. United Nations Convention against Corruption. 4. EU anti-fraud policy; OLAF (European Anti-Fraud Office) and its investigative powers. Preventing corruption.
Activity forms of students	Frontal work: 50 % Individual or group work: 15% Test: 15% Communication situation exercises: 20%
Compulsory reading and its availability	• Falus, Orsolya (2021), DIGITAL LEGAL KNOWLEDGE TEXTBOOK FOR INTERNATIONAL STUDENTS. Dunaújváros: DUE Press. ISBN 978-615-6142-12-2 (available: Moodle) • United Nations Convention against Corruption (UNCAC) is the only legally binding universal anti-corruption instrument. It was drafted and negotiated in Vienna, Austria in 2002-2003 and subsequently adopted by the United Nations General Assembly on 31 October 2003. • https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XVIII-14&chapter=18#EndDec • UNCAC: https://www.unodc.org/corruption/en/learn/what-is-uncac/prevention.html • https://www.unodc.org/corruption/en/learn/what-is-corruption.html • https://www.unodc.org/corruption/en/uncac/index.html • OLAF: https://anti-fraud.ec.europa.eu/index_en • Prevention: https://corruptionprevention.gov.hu/index
Recommended reading and its availability	• The Universal Declaration of Human Rights (available: https://www.un.org/en/sections/issues-depth/human-rights/) • The European Convention on Human rights (available: https://www.coe.int/en/web/human-rights-convention) • The Fundamental Law of Hungary (available: http://hunmedialaw.org/dokumentum/151/THE_FUNDAMENTAL_LAW_OF_HUNGARY.pdf) • Elizabeth Wolfenden: How to Evaluate an Oral Presentation • (available: https://www.theclassroom.com/evaluate-oral-presentation-2661.html)
Hand-in Assignments/ measurement reports	Oral exam in the the exam period.
Description of midterm tests	On 7th week midterm test (legal cases) On 13th week final test (legal cases) Formation of the test grade: 0-50% insufficient 51-60% sufficient 61-70% average 71-80% good 81%- excellent
Framework and rules for the use of artificial intelligence	The use of Artificial Intelligence is partially permitted: • during class work, for data collection for assignments, for orientation, • during preparation for presentations. The use of all AI tools is prohibited during knowledge assessments and writing tests.

Economics 1.

<table>
<tr><td colspan="2" rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="3">Közgazdaságtan 1.</td><td colspan="2">Level</td><td>A</td></tr>
<tr><td>In English</td><td colspan="3">Economics 1.</td><td colspan="2">Code</td><td>DUEN(L)-TKT-151</td></tr>
<tr><td colspan="3"></td><td colspan="6"></td></tr>
<tr><td colspan="3">Responsible educational unit</td><td colspan="6">Institute of Social Sciences
Department of Economics and Management</td></tr>
<tr><td colspan="3">Name of Mandatory Preliminary Study</td><td colspan="6"></td></tr>
<tr><td colspan="3" rowspan="2">Number of Lessons</td><td colspan="4" rowspan="2">Requirements</td><td colspan="2" rowspan="2">Credits (ECTS)</td><td rowspan="2">Language of Education</td></tr>
<tr><td>Theoretical</td><td colspan="2">Practice</td><td colspan="2">Lab</td></tr>
<tr><td>Full-time</td><td>150/39</td><td>1</td><td></td><td>2</td><td></td><td>0</td><td colspan="2" rowspan="2">E
(Exam)</td><td colspan="2" rowspan="2">5</td><td rowspan="2">english</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td>5</td><td></td><td>10</td><td></td><td>0</td></tr>
<tr><td colspan="3">Teacher responsible for the course</td><td>Name</td><td colspan="3">Dr.Mohamad Saleh</td><td colspan="2">Position</td><td>Associate Professor</td></tr>
<tr><td colspan="3">Educational goals</td><td colspan="6">Goals, development objectives
The course provides an introduction to economic concepts and basic economic theories. The course is divided into two parts: microeconomics, which focuses on the decision-making of individual consumers and firms, and macroeconomics, which focuses on economic issues at the aggregate level.The goal is for students who complete the course to understand the connections between micro- and macroeconomic phenomena, the economic relationships and the drivers of economic actions. They should understand the basic decision-making and substitution possibilities arising from the limitation of resources, the functioning of economies and markets, the place and role of actors in them, as well as the costs and benefits of economic interactions.</td></tr>
<tr><td colspan="3" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="5">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="5">In a classroom with the use of projector or computer in each seminar.</td></tr>
<tr><td>Lab</td><td colspan="5"></td></tr>
<tr><td colspan="3" rowspan="4">Requirements (expressed in learning outcomes/competencies to be acquired)</td><td colspan="6">Knowledge
Students as potential Economist know:
• the types, terminology and main principles of Economics
• basic concepts in Economics
• the steps of analysis in Economics</td></tr>
<tr><td colspan="6">Ability
Students will be able to:
• carry out basic analysis
• formulate a synthetic relationship
• carry out adequate evaluation activities</td></tr>
<tr><td colspan="6">Attitude
- Openness to authentic mediation and transmission of the overall mindset and the essential characteristics of practical operation of the profession.
- Desire for continuous self-education in the field of economics.</td></tr>
<tr><td colspan="6">Autonomy and responsibility
• In professional questions, the students can play the role of a decision-maker and are able to solve problems alone.
• They can tackle problems as responsible persons, i.e. in a certain situation, they can decide if there is a need to cooperate with others.</td></tr>
<tr><td colspan="3">Brief description of the subject content</td><td colspan="6">Economics as a science. Introduction to economic thinking. Macro- and microeconomics. Positive and normative economic approach. The subject of</td></tr>
</table>

	economics, basic concepts. Economic systems. Coordination mechanisms in the economy. The market mechanism. The functioning of the market and the price mechanism. Demand and supply. Demand and supply function/curve. Market equilibrium and imbalance. Actors of the mixed economy. Motivations, income, and expenses of the household. Management of business organizations. Costs, income, and profit concepts. Market forms and market structures. The concept of national economic performance, the most important statistical indicators. Basic concepts, conditions, and measurement of economic growth. The concept and functions of money. The modern banking system and the money supply. Money market and inflation processes. Basic categories of the labor market. Labor market imbalances, unemployment. The role of the state in a market economy.
Activity forms of students	Guided learning Individual learning Guided task completion Individual/group task completion
Compulsory reading and its availability	• Samuelson, P.A.- Nordhaus, W.D. Economics (2009) Mcgraw-Hill Publ.Comp. ISBN 0073511293
Recommended reading and its availability	• N. Gregory Mankiw (2020) Principles of Economics. 9. kiadás. Cengage Learning Inc. ISBN-13: 978-0357038314 • Moffat, M. ((2020) Online Microeconomics Textbook https://www.thoughtco.com/online-microeconomics-textbook-1147732 • Moffat, M. ((2020) Online Macroeconomics Textbook Resources https://www.thoughtco.com/online-macroeconomics-textbook-resources-1147693 • Thomas Sowell (2014) Basic Economics. Basic Books ISBN-13: 978-0465060733 • Begg, D., S. Fischer and R. Dornbusch Economics 12e (2020) McGraw- Hill 800p ISBN 978-1526847393 • The Economy 2.0 CORE Econ. https://books.core-econ.org/the-economy/index.html
Hand-in Assignments/ measurement reports	Preparation and presentation of home assignments on predetermined topics of micro and macroeconomics.
Description of midterm tests	The test usually lasts for one hour and covers everything taught up to the date of test. The question paper will consist of multiple choice questions and short essay quest ions. With the possibility of making up/correction in the last week of study.
Frameworks and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: • during class work, for data collection and orientation for assignments • for data collection for certain homework assignments • during preparation for a closed-class paper The use of all AI tools is prohibited during knowledge assessments and writing closed-door papers.

Entrepreneurship

Subject name		In Hungarian		Vállalkozástan					Level		A
		In English		Entrepreneurship					Code		DUEN(L)-TVV-122
Subject code											
Responsible educational unit				Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study				-							
Number of Lessons								Requirements	Credits (ECTS)		Language of Education
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M (Midterm mark)	5		English
Correspondence	150/15		5		10		0				
Teacher responsible for the course				Name		Dr. Andrea Keszi-Szeremlei			Position		College Teacher
Educational goals				The curriculum provides a comprehensive knowledge of entrepreneurship, including the creation, operation, transformation, liquidation, financial management and the management of assets and liabilities. The student will be familiar with the means of preventing corruption. The student will be able to review the essence and the conduct of corporate management and to understand and apply corporate (business) law and regulations. They will be familiar with the economic, financial, human, material and property characteristics and components of companies, the risks inherent in the activities of companies and their types, the characteristics of international and domestic corporate cooperation and will be able to apply these at a skill level. In addition to theoretical knowledge, practical features will also be explored.							
Typical delivery methods				Theoretical		In a classroom with the use of projector or computer in each lecture.					
				Practice		Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work					
				Lab		-					
Requirements				**Knowledge** • Understands the conceptual framework of business management. • Is familiar with the mechanisms of corporate operations. • Is familiar with the legal background and internal and external environment of companies. • Is familiar with the management systems, objectives, and strategies of companies.							
				Ability • Able to use the concepts of the field professionally. • Able to identify and define the resources of companies. • Able to implement the basics of corporate management. • Able to understand corporate goals and strategic steps. • Able to understand and use relevant literature.							
				Attitude • Open to actively interpreting changing communication communities and social situations. • Sensitive to solving problems arising from the functioning of relationships. • Receptive to exploiting opportunities for development.							
				Autonomy and responsibility • Takes responsibility for their own development. • Cooperates with others and seeks solutions to problems. • Feels responsible for the development of their work environment.							
Brief description of the subject content				The formation of companies, their concept, and the legal background of their							

	operation. The macro and micro, external and internal environment of companies. Anti-corruption in business practice (forms of corruption, means of prevention). Companies as economic systems, characteristics of economic systems, basic concepts of their operation. Company goals, goal systems, strategy. Economic decisions of companies. Description of corporate resources and activity systems. Company assets and resources, company financing. Organization and management of companies. Resource management in companies. Presentation of corporate production, services, and material processes. Internal and external logistics of companies. Human resource management in companies. Sources and role of corporate information. Corporate innovation. Corporate revenue and cost management. The concept of quality, total quality management and control (TQM). Corporate strategy, strategic principles, strategic management, strategy development, implementation, and control. Controlling. The role and presentation of business planning. Corporate ethics, responsibility, and culture in the operation of companies. Outsourcing, its development, types, and implementation possibilities.
Activity forms of students	Corporate cooperation. Individual and group activities: participation in individual and small group tasks, participation in guided corporate role-playing, analysis of case studies, examination of complex corporate simulations.
Compulsory reading and its availability	• William D. Bygrave - Andrew Zacharakis (2014): Entrepreneurship, 3rd Edition, John Wiley & Sons, DUE Library • Dollinger, Marc J. (2008): Entrepreneurship, Marsh Publications, Letölthető: https://shorturl.at/R1ydn - egyes részei Materials on MOODLE
Recommended reading and its availability	• Jerome Katz, Richard Green (2014) Entrepreneurial Small Business. 4th ed. McGraw-Hill International Ed., ISBN: 978-0078029424, DUE Library
Hand-in Assignments/ measurement reports	Presentation and analysis of the business activities of a company selected by the student in week 14, using the knowledge acquired so far. Short presentation on a predetermined company-related topic.
Description of midterm tests	Midterm tests on weeks 7th and 12th. Supplementary test on week 13th.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Mathematics 2.

<table>
<tr><td rowspan="2">Title of the subject</td><td>Hungarian</td><td colspan="5">Matematika 2</td><td>Level</td><td>compulsory</td></tr>
<tr><td>English</td><td colspan="5">Mathematics 2</td><td>Code</td><td>DUEN(L)-IMA-211</td></tr>
<tr><td colspan="9">2026/27/1</td></tr>
<tr><td colspan="2">Responsible Educational Institute</td><td colspan="7">Informatics Institute</td></tr>
<tr><td colspan="2">Prerequisites</td><td colspan="5">Mathematics 1.</td><td></td><td>DUEN-IMA-151
DUEL-IMA-151</td></tr>
<tr><td rowspan="2">Type</td><td colspan="2" rowspan="2">Weekly contact hours</td><td colspan="4">Lecturers</td><td>Practice sessions</td><td>Labs</td><td rowspan="2">Requirement</td><td rowspan="2">Credits</td><td rowspan="2">Language</td></tr>
<tr><td colspan="2">Semester</td><td colspan="2">Semester</td><td>Semester</td></tr>
<tr><td>Full time</td><td>150/39</td><td colspan="2"></td><td>1</td><td colspan="2"></td><td>2</td><td>0</td><td rowspan="2">Exam</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Part time</td><td>150/15</td><td colspan="2">Semester</td><td>5</td><td colspan="2">Semester</td><td>10</td><td>Semester</td><td>0</td></tr>
<tr><td colspan="2">Course cordinator</td><td colspan="3">Name</td><td colspan="3">Dr. Antal Joós</td><td>Position</td><td>Associate Professor</td></tr>
<tr><td colspan="2"></td><td colspan="8"></td></tr>
<tr><td colspan="2">Course objectives and justification (content, learning outcomes, place in curriculum)</td><td colspan="8">Objectives and development goals
Acquiring the mathematical foundations necessary for further studies.
Training background, development objectives

Training background: knowledge and skills acquired in public education.
Related subjects: Operations Research and Decision Theory.
Related objectives: learning the concepts and relationships of linear algebra, probability theory, and statistics that are essential for working in the field.</td></tr>
<tr><td colspan="2" rowspan="4">Typical lesson types:</td><td>Lecture</td><td colspan="7">Presentation of concepts and methods in a large lecture hall, using a blackboard and projector.</td></tr>
<tr><td>Seminar</td><td colspan="7">Classroom practice, student-written posts, presentations, case study analysis</td></tr>
<tr><td>Lab</td><td colspan="7"></td></tr>
<tr><td>Other</td><td colspan="7"></td></tr>
<tr><td colspan="2" rowspan="4">Requirements
(in learning outcomes)</td><td colspan="8">Knowledge
• Knows the methods and procedures necessary for solving mathematical problems in the fields of economics, management, and engineering.
• Possesses the mathematical, probability, and statistical knowledge necessary for their field of expertise.</td></tr>
<tr><td colspan="8">Skills
• Is able to apply the mathematical knowledge and skills they have learned.
• Applies the problem-solving methods and procedures learned.
• Is able to prepare their own solution plan and defend it in discussions (argumentative debate skills) in relation to the mathematical concepts learned. Is able to organize their own learning process effectively, find and use various learning resources (printed, electronic).</td></tr>
<tr><td colspan="8">Attitude
• Is open to learning about and accepting mathematics-based, applied mathematical developments and innovations related to their qualification and field of expertise.
• Is interested in new methods and tools related to their field of expertise.</td></tr>
<tr><td colspan="8">Autonomy and responsibility
• Responsibility for their own work and that of their colleagues.</td></tr>
</table>

Short description of subject content	Combinatorics. Experiment. Events, operations with events. The concept of probability. Axioms of probability theory. Conditional probability. Independence of events. The total probability theorem. Bayes' theorem. Probability variables and their characteristics. Notable probability distributions. The law of large numbers. The central limit theorem. Basic concepts of mathematical statistics. Descriptive statistics. Calculation of numerical characteristics. Point estimation and interval estimation for population mean, variance, and proportion. Statistical inferences. Parametric tests for mean and variance. Nonparametric tests. Basics of correlation and regression calculation. Tasks related to nuclear energy and green energy.
Forms of student activity	Learning theoretical material with guidance and independently. Solving tasks with guidance and independently. Learning theoretical material with guidance: 10% Learning theoretical material independently: 30% Solving tasks with guidance: 30% Solving tasks independently: 30%
Compulsory literature	• R.E. Walpole, R.H. Myers, S.L.Myers, K.Ye: Probability and Statistics for Engineers and Scientists, 9th Edition, Pearson Education Limited 2016.
Recommended literature	
Assignments	As stated in the first lesson.
Description and schedule of exams	As stated in the first lesson.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted. Artificial intelligence is permitted for checking homework assignments, accelerating the learning process, and generating sample examples to facilitate understanding of concepts, but its use is prohibited in closed-book exams.

Industrial materials

Subject name		In Hungarian	**Műszaki anyagismeret**						Level	**BSC**	
		In English	**Industrial materials**						Code	**DUEN(L)-MST-210**	
2026/2027 I.											
Responsible educational unit			**Institute of Engineering**								
Compulsory prerequisite subject:			-								
Type Full time		Number of lessons							Requirement	credit	**Language of education**
		Lecture		Seminar		Lab					
Part time	**150/60**	Per week	1	**Per week**	0	Per Week	**2**		V	5	**English**
Person responsible for the subject:	**150/20**	Per semester	5	Per semester	**0**	Per semester	**10**				
subject teacher				**Name**		**Dr. Imre Kovács**				Position	**Associate professor**
The training objective and justification of the course (content, outcome, place in the curriculum)				**Short-term Objective** The aim of the course is for students to acquire basic chemical knowledge, through which they will become familiar with the structure of materials, the electron shell structure that determines material properties, the types of chemical bonds that determine macroscopic characteristics, and the microscopic structure and testing methods of individual types of materials (metals, ceramics, polymers). Students will learn about the relationships between the structure and properties of materials, and based on this, in simpler cases they will be able to select the materials that best suit the intended use.							
				Educational background, development goals The subject builds on the students' basic knowledge of chemistry, which lays the foundation for understanding the structure of materials, the electron shell structure and various chemical bonds. Its development goal is to provide students with an understanding of the relationships between the microscopic structure and macroscopic properties of metals, ceramics and polymers, as well as to familiarize them with the basic methods of testing them. The course contributes to students' ability to independently select the appropriate materials for simpler engineering tasks, in accordance with the requirements of use.							
Typical transfer methods				**Lecture**	**ppt slide, using powder ejector**						
				Exercise	-						
				Lab	**- Individual and group work in university laboratories**						
				Other	-						
Requirements (expressed in academic results)				**Knowledge** • He/She has a comprehensive knowledge of the basic facts, directions and boundaries of the subject area of the technical field. • He/She knows the general and specific mathematical, natural and social science principles, rules, relationships and procedures necessary for the cultivation of the technical field. • He/She has a thorough knowledge of the structural materials used in the mechanical engineering field, the methods of their production and the conditions of their application.							

	Ability • The student is able to apply basic and systemic knowledge of technical materials to interpret the structure, properties and behavior of materials. • He/she is able to compare the characteristics of material groups (metals, ceramics, polymers) and to professionally apply the procedures related to the application and production of materials in simple engineering tasks. • Based on the acquired knowledge, he/she is able to select the most suitable material for the given technical requirements and to justify material selection decisions.
	Attitude • The student is able to apply basic and systemic knowledge of technical materials to interpret the structure, properties and behavior of materials. • He is able to compare the characteristics of material groups (metals, ceramics, polymers) and to professionally apply the procedures related to the application and production of materials in simple engineering tasks. • Based on the acquired knowledge, he is able to select the most suitable material for the given technical requirements and to justify material selection decisions.
	Autonomy and responsibility • She makes her decisions carefully, in consultation with representatives of other fields, and independently, for which she takes responsibility.
Brief description of the course content	Atomic structure. Structure of the periodic table. Electron configuration. Types and characteristics of chemical bonds. Electron affinity, electronegativity, oxidation number. Strong bonds. Weak bonds. General characterization of metals, reactivity. Basic knowledge of organic chemistry. Grouping of carbon compounds, nomenclature. Isomerism. The most important reactions of organic materials. Connection possibilities of macromolecules as the basis for polymer production. Basic knowledge of silicate chemistry. Basic knowledge of colloidal chemistry. State change in solid-phase processes. Polymorphic transformation. Types of technical materials. Interaction of structure - processing - properties. Crystal structure, crystal systems. Crystal, crystallite. Defects of the crystal lattice. Movement of atoms in the material, diffusion. Phases and fabric elements of metallic materials. Significance and definition of equilibrium phase diagrams. Rules for reading two- and three-component equilibrium phase diagrams. Basic types of two-component equilibrium phase diagrams.
Student activities	Attending lectures and taking handwritten notes, independent preparation for the zh papers using ppt slides (50%), acquiring practical knowledge by participating in laboratory exercises (30%). Independent preparation of assignments and reports 20%.
Required literature and its availability	• Balázs Verő, Éva Dénes, Zsolt Csepeli: Introduction to Technical Materials Science, College Publishing House, Dunaújváros • Éva Dénes, Péter Farkas, Zsoltné Fülöp, Zoltán Szabó: Metal Technology, College Publishing House, Dunaújváros
Recommended literature and its availability	• Dr. Tamás Tóth: Mechanical properties of materials and methods of their testing. College Publishing House, Dunaújváros
Description of tasks/measurement reports to be submitted	As mentioned in the first lesson, prepare measurement reports throughout the semester.

Description and schedule of closed places	As stated in the first lesson,
Frameworks and rules for the use of artificial intelligence	The use of artificial intelligence within the framework of this course is partially permitted: it may be applied for the preparation of in-class assignments (e.g., organizing concepts related to material structure, reviewing material-related correlations), as well as for developing the structure or improving the linguistic quality of submitted reports and written assignments. Students are required to ensure that all submitted professional content—particularly the interpretation of relationships between material structure, microstructural features, and material properties—reflects their own, verifiable work. During midterm tests and examinations, the use of artificial intelligence in any form is strictly prohibited.

Heat and Fluid Dynamics

Subject name		In Hungarian	**Hő és áramlástan**							Level		**BSc**	
		In English	**Heat and Fluid Dynamics**							Code		**DUEN(L)-MUT-250**	
2023/2024 I.													
Responsible educational unit			**Institute of Technology**										
Compulsory prerequisite subject:			**MUT-151**										
Type		Number of lessons								Requirement		Credit	Language of education
		Lecture		Seminar		Lab							
Full time		Per week	1	Per week	1	Per week	**1**						
Part time		Per semester	5	Per semester	**5**	Per semester	**5**			**V**		**5**	**English**
Person responsible for the subject:				name		**Endre Kiss, PhD**				position		College Professor	
Course objectives and justification (content, learning outcomes, place in curriculum)				**Short-term objective** The study of the practical problems solutions in heat and fluid dynamics. **Objectives and development goals** Heat and Fluid Dynamics based on Mathematics and Engineering Physics is founding the professional knowledge bases of those subjects which are using fluid dynamic and thermal knowledge. The subject Heat and Fluid Dynamics is deepening the knowledge of students in Fluid Dynamics and Thermodynamics. The subject is providing information and knowledge for the engineering subject in the field dealing with by using presentations, problem solving lessons and laboratory practices, all are turning the activities to practical applications.								
Typical delivery methods				Lecture	- For all students, using a large lecture hall, a board presentation, a projector or an overhead projector								
				Seminar, problem solving	- For every student, problem solving in small groups								
				Lab	-Measurements in pair								
				Other	-								
Requirements (in learning outcomes)				**Knowledge** • Have a comprehensive knowledge of the basic facts, directions and limits of the subject area of engineering. • Knowledge of the general and specific rules, contexts and procedures for the operation of the technical field. • You know the terminology, key concepts and theories related to your field. • Comprehensive knowledge of the main theories in the field of knowledge acquisition and problem solving your methods. He/she knows the measuring procedures used in mechanical engineering, their instruments, instruments and measuring equipment. • Understand, characterise and model the structure and operation of the structural units and elements of mechanical systems, the design and interrelationship of the system components used.								
				Ability • The ability to analyse at a basic level the disciplines that make up the knowledge base of the technical field, to synthesise relationships and to make appropriate evaluations. • Ability to apply the most important terminology, theories and procedures of the technical field in the performance of related tasks. • Ability to plan, organise and carry out independent learning.								

	• Ability to identify routine professional problems, and the principles and techniques needed to solve them to explore, formulate and (standard operations in practice). • Ability to understand and use literature, computer and library resources specific to their field. • The acquired IT knowledge can be used to perform tasks in the field of apply it in your solution. • Ability to build basic models of technical systems and processes. • Ability to communicate in their mother tongue in a professionally appropriate manner, orally and in writing, according to their field of specialisation.
	Attitude • It assumes and authentically represents the social role of its profession and its fundamental relationship with the world. • It is open to learning about, embracing and authentically communicating professional, technological development and innovation in engineering. It tries to solve problems in cooperation with others, where possible. • Sufficient stamina and tolerance of monotony to carry out practical activities has. • Using his/her technical knowledge, he/she strives to understand the observable phenomena as thoroughly as possible, to describe and explain their laws.
	Autonomy and responsibility • In unexpected decision situations, he/she independently thinks through and develops comprehensive, substantiating professional questions on the basis of given sources. • In carrying out his/her professional duties, he/she will also cooperate with qualified professionals in other fields (primarily technical, economic and legal). • He shares his experience with his colleagues, helping them to develop. It takes responsibility for the consequences of its technical analyses, its proposals and its decisions
Short description of subject content	The basics of fluid dynamics and thermodynamics. Euler and Bernoulli equations, Haagen-Poiseuille equations, viscosity, laminar and turbulent flow, pressure drag in turbulent flow. Pressure drops in fittings. Impulse theorem. Similarity. Solid body in viscous substance. Intensive and extensive quantities. Universal and unified gas law. The mechanical work and the heat, and the first law of thermodynamics. Isochoric, isobaric, isotherm and adiabatic processes. The polytropic process. Cycles. Otto and Diesel cycles. Enthalpy, entropy, the second law of thermodynamics. Real gases. Thermal energy transport, conductance. convection and radiation. Heat pump and refrigerator.
Types of student activity	Lecture: Written text processing with note-taking 40%, theoretical material self-processing 20%, task solution 40%. Labor: Heard text processing with note-taking 10%, home preparation for measurement 20%, measurement 40%, minutes preparation 30%.
Required reading and resources	• Kiss E. Heat and Fluid Dynamics Electronic notes (Moodle) • Kiss E. Heat and Fluid Dynamics Problem solving Electronic notes (Moodle) • Kiss E. Laboratory syllabuses Electronic notes (Moodle)
Recommended reading and resources	• Dr Gruber, Dr Blahó: Mechanics of Fluids, Tankönyvkiadó, Budapest, 1973 • Grósz Gy. Thermodynamics, BME 1996
Assignments	Full time: 5 measurement reports Part time: 3 measurement reports
Description and schedule of exams	According to semester plan There are two tests during the semester. The first is in the 6th, and the second in the 13th week. The test consists of 10 free choice questions (max. 30 points), two assay questions (max 20 points), and two problems to solve for 50 points. If the res
Framework and rules for the use of artificial intelligence	It is not allowed to apply artificial intelligence

General and Business Statistics

<table>
<tr><td rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="4">Általános és gazdasági statisztika</td><td>Level</td><td>A</td></tr>
<tr><td>In English</td><td colspan="4">General and business statistics</td><td>Code</td><td>DUEN(L)-TKT-211</td></tr>
<tr><td colspan="2">Subject code</td><td colspan="6"></td></tr>
<tr><td colspan="2">Responsible educational unit</td><td colspan="6">Institute for Social Sciences
Department of Economics and Management</td></tr>
<tr><td colspan="2">Name of Mandatory Preliminary Study</td><td colspan="6"></td></tr>
<tr><td colspan="2">Number of Lessons</td><td colspan="4" rowspan="2">Requirements</td><td rowspan="2">Credits (ECTS)</td><td rowspan="2">Language of Education</td></tr>
<tr><td></td><td>Theoretical</td><td>Practice</td><td>Lab</td></tr>
<tr><td>Full-time</td><td>150/39</td><td>1</td><td>0</td><td>2</td><td rowspan="2">M (Midterm mark)</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td>5</td><td>0</td><td>10</td></tr>
<tr><td colspan="2">Teacher responsible for the course</td><td>Name</td><td colspan="3">Dr. Mohamad Saleh Saleh</td><td>Position</td><td>Associate Professor</td></tr>
<tr><td colspan="2">Educational goals</td><td colspan="6">Students will be aware of and able to use the electronic databases.
They know and are able to use high-level statistical methods to analyse economic and social phenomena.
They acquire high-level statistical tools necessary for carrying out analyses.
After the course students can apply the basic statistics methods. They can prepare statistic reports necessary to understand business processes. They can make simple statistic analyses from the data available. They can apply mean, dispersion and distribution methods used for analysing quantitative data. They are capable of making and analysing PIVOT tables. They can quantify factors affecting complex economic processes by standardisation. They can apply the method of correlation calculation and variance analysis to explore relations as well as association indices. Having completed the course the students are able to use statistic databases online. They can collect, systematise, process and analyse the data needed to solve a certain task or make a decision, and present them to the decision maker in an appropriate form.</td></tr>
<tr><td colspan="2" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="5">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="5">In a classroom with the use of projector or computer in each seminar.</td></tr>
<tr><td>Lab</td><td colspan="5"></td></tr>
<tr><td colspan="2" rowspan="3">Requirements (expressed in learning outcomes/competencies to be acquired)</td><td colspan="6">Knowledge
Students will be able to:
• use the electronic databases
• know and use statistic methods for the purpose of economic and social analysis
• know statistic methods to solve analysis tasks</td></tr>
<tr><td colspan="6">Ability
Students will be able to:
• use simple statistic methods
• make simple statistical analysis
• .use mean, scatter and dispersion for analyzing quantitative data
• create and analyze Pivot chart
• use statistical databases on the internet
• collect, organize, process and analyze data,
• use a statistical software individually</td></tr>
<tr><td colspan="6">Attitude
• They are open to the authentic transmission and delivery of the comprehensive way of thinking and fundamental characteristics of their profession.</td></tr>
</table>

	• They are curious about and interested in learning, and elementary work situation. • Ready to share the common work and knowledge with others.
	Autonomy and responsibility • They work independently, under constant control. • Make decisions in legal and ethical rules of the field. • Feel responsibility about own or group led work, about the achievements and failures
Brief description of the subject content	Basic definitions of statistics: multitude, criteria, measuring scales. Methods of purchasing and using data. Basic statistical operations. Simple analysis, ratios, graphical representations. Definition of multitude according to a criterion: according to arbitrary types of criteria. Arrangement and classification according to quantitative criteria. Types of quantitative series. Quantitative values. Graphical representations and attributes of frequency distributions. Position indexes: median, mode, mean. Types of means. Diffusion indexes: stretch indexes, dispersion, variance, relative dispersion. The analysis of concentration. Shape indexes: asymmetry and taper. Description of multitude according to several criteria. Description of heterogenic multitude. Part and complex ratio. Part and main means. Dispersion and variance of part and main multitude. Description of the relation between criteria. Types of relations between criteria. Association, mixed relation, correlation, rank correlation. Comparison with standardization and index calculation. Resolution of differences, resolution of quotient. Comparison of aggregates with index calculation. Aggregated types of indexes. Mean types of indexes. Laspeyres- and Paasche indexes. Price – scissors. Analysis of timelines: basic analysis. Decomposition timeline models. Smoothing, clearing, prognosis, cyclicality, seasonality Basic definitions of statistics: multitude, criteria, measuring scales. Methods of purchasing and using data. Basic statistical operations. Simple analysis, ratios, graphical representations. Definition of multitude according to a criterion: according to arbitrary types of criteria. Arrangement and classification according to quantitative criteria. Types of quantitative series. Quantitative values. Graphical representations and attributes of frequency distributions. Position indexes: median, mode, mean. Types of means. Diffusion indexes: stretch indexes, dispersion, variance, relative dispersion. The analysis of concentration. Shape indexes: asymmetry and taper. Description of multitude according to several criteria. Description of heterogenic multitude. Part and complex ratio. Part and main means. Dispersion and variance of part and main multitude. Description of the relation between criteria. Types of relations between criteria. Association, mixed relation, correlation, rank correlation. Comparison with standardization and index calculation. Resolution of differences, resolution of quotient. Comparison of aggregates with index calculation. Aggregated types of indexes. Mean types of indexes. Laspeyres- and Paasche indexes. Price – scissors. Analysis of timelines: basic analysis. Decomposition timeline models. Smoothing, clearing, prognosis, cyclicality, seasonality
Activity forms of students	Processing heard and read texts by taking notes. Independent knowledge processing and acquisition. Guided and independent analysis of databases using SPSS/Excel in practical courses.
Compulsory reading and its availability	• TRIOLA, Mario F. (2014): Elementary Statistics, Pearson New International Edition. Pearson Education 864 p. ISBN 978-0-321-8369-60 • BLACK, Ken (2010): Business Statistics for contemporary decision making, Sixth edition. Wiley 906 p. ISBN 13 978-0470-40901-5
Recommended reading and its availability	• FREEDMAN, David – PISANI, Robert – PURVES, Roger (2007): Statistics. 720 p. ISBN 978-0-393-92972-0 (Teljes szöveggel:

	http://www.e-bookspdf.org/download/statistics-4th-edition-david-freedman.html) (Letöltve: 2014. május 28.)
Hand-in Assignments/ measurement reports	Theoretical exam (1), based on concepts presented in the lectures, in the form of test and essay questions. Practical exam (2), solving tasks based on sample exercises completed during the practical sessions. Submitted paper (3), applying the topics and calculations reviewed in the lectures and practical sessions to a selected economic phenomenon, based on group work.
Description of midterm tests	Mid-term grade based on the average of the 3 assessment points. The 3 assessment points are scheduled for weeks 6th, 9th, and 12th.
Framework and rules for the use of Artificial Intelligence	The use of artificial intelligence is partially permitted: • during class work, • for data collection and information gathering for assignments, • for data collection for certain exams, • and during exam preparation. The use of any AI tools is prohibited during knowledge assessment and written exams.

Informatics

Title of Subject		Hungarian		**Informatika**					Level		
		English		**Informatics**					Code	**DUEN(L)-ISF-010**	
Responsible Academic Unit				Institute of Information Technology, Department of Software Development and Application							
Compulsory prerequisite subject				-							
Type		Study load per week							Requirements	Credit	Language of instruction
		Lecture		Seminar		Lab					
Full time	150/45	Per semester	0	Per semester	0	Per semester	3		F	5	English
Part time	150/15	Per semester	0	Per semester	0	Per semester	15				
Person responsible for the subject				Name		Dr. Mariann Váraljai			position	associate professor	

Course objectives and justification (content, learning outcomes, place in curriculum)	**Education history, development goals** In addition to the necessary basic IT knowledge, students should acquire a higher level of knowledge in the given areas that will enable individuals to develop the knowledge and skills necessary for the efficient, effective and professional use of the most common computer applications in the workplace. • Be able to confidently manage a graphical operating system. • Be able to browse the Internet, search for relevant information and conduct electronic correspondence. Learn about scientific search services and the general rules of etiquette for Internet communication (NETiquette) • Be able to create any complex, multi-page text document with a word processing program, and be able to create professional digital text. • Be able to create tables, manage data with a spreadsheet program, and be able to implement data visualization. • Be able to create presentations and apply advanced presentation techniques. • Be able to use artificial intelligence (AI) responsibly and safely, with particular attention to critical thinking when making decisions involving AI technology. • Be able to develop an appropriate ethical attitude towards AI and data protection. • Be able to independently creatively use any innovative IT tools and applications.	
Typical transfer ways	Lecture	
	Seminar	
	Lab	In classrooms with the use of projector and computer, students solve individual tasks on the computers, using programs, with teacher assistance. Computer based exercises, individual tasks.
	Other	
Requirements (expressed in educational results)	**Knowledge** • Students familiar with the general and specific mathematics, informatics principles, rules, relationships and procedures of the user programs in the field of information technology. • They have adequate expertise in the IT field specialist knowledge of specific tools for selecting tools and to carry out its tasks.	
	Ability • Students are able to perform partial activities independently during solving more complex system problems. • They apply their studied problem-solving methods and procedures efficiently in expertly tasks. • Throughout the course, participants will learn to handle AI technology with critical thinking and make responsible decisions in source management.	

	Attitude • Students are interested in new methods and tools related to IT section. • Students consider their own professional competences and activities on reflective way. • Open to understand and accommodate professional, technological development and innovation area. • They apply technology in an ethical manner and in accordance with moral guidelines.
	Autonomy and Responsibility • Students strive for efficient and quality work. • The responsible for the technical operations carried out independently.
Short description of subject content	– Confident use of operating system: managing files and folders. – Goal-oriented use of the Internet, knowledge of NETiquette. Targeted search on the Internet. Use of email programs. – Word processing with MS Word word processor program: Basic text editing operations, creating tables, applying styles, creating a table of contents and other lists, and creating mail merges. – Spreadsheet management with MS Excel spreadsheet program: Creating, uploading and formatting tables, using cell references, formulas, functions, charts as data visualization, applying simple database operations, managing and visualizing data. – Making a presentation with MS PowerPoint or Prezi: basic slide editing and formatting operations, using the slide master, slide templates, applying styles, slideshow settings and presentation techniques. – They make independent, creative use of innovative information technology (e.g. AI) and tools.
Forms of student activity	– Heard information processing by creating notes, – systematization of information has led by tasks (40%) – Self-processing (individual) tasks (60%)
Required reading and resources	1. WORD 2010 All-In-One for Dummies by Doug Lowe with Ryan Williams, Wiley Publishing Inc., 2010, Indianapolis, Indiana (free pdf on Internet) 2. EXCEL 2010 All-In-One for Dummies by Greg Harvey, Wiley Publishing Inc., 2010, Indianapolis, Indiana (free pdf on Internet) 3. ACCESS 2010 All-In-One for Dummies by Margaret Levine Young, Alison Barrows, and Joseph C. Stockman, Wiley Publishing Inc., 2010, Indianapolis, Indiana (free pdf on Internet) 4. POWER POINT 2010 All-In-One for Dummies by Doug Lowe, Wiley Publishing Inc., 2010, Indianapolis, Indiana (free pdf on Internet) 5. The Internet for Dummies 12th edition by John R. Levine – Margaret Levine Young, Wiley Publishing Inc, Indiana (free pdf on Internet) 6. OFFICE 2010 All-in-one for Dummies by Peter Weverka, Wiley Publishing, Inc. Indiana (free pdf on Internet)
Recommended reading and resources	– Electronic literature and learning materials in Moodle or in Neptun. – MS Office Tutorial and examples (Internet).
Assignments	**Compulsory assignment:** Create an own individual presentation using MS Power Point or Prezi program based on the conditions set by the instructors. Deadline: **until Week 10!** (Upload to the Moodle system!) **Not mandatory, but for extra (bonus) points:** The student has the opportunity to solve a Word and Excel tasks on a topic of his or her own choice that match and are consistent with the learning materials of the semester. The extra point will be included in the final grade. It is necessary to discuss the undertaken tasks with the teacher in advance. The tasks are to create a document, table, database that meet real needs with the help of Microsoft Office programs.
Description and schedule of exams	At the end of each topic, students write closed papers, typically: – ***Week 5***: Word processing computer-based test – ***Week 11***: Spreadsheet management computer-based test

	In case of any computer-based tests, the opportunity for improving grades is available in the last week of the school period (typically ***in Week 13***) and during the exam period.
Framework and rules for the use of artificial intelligence	- **Partial authorization** of artificial intelligence: For classwork and individual assignments. - **Prohibition** of artificial intelligence: For the two midterm exams and the make-up midterm exams.

[Állapot]Business Economics

Subject name		In Hungarian		Vállalatgazdaságtan				Szintje		A	
		In English		Business economics				Level		A	
Subject code				DUEN-TVV-220							
Responsible educational unit				Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study				-							
Number of Lessons								Requirements		Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M (Midterm mark)		5	English
Correspondence	150/15		5		10		0				
Teacher responsible for the course				Name		Dr. Mohamad Saleh				Position	Associate professor
Educational goals				The curriculum provides comprehensive knowledge on the subject of business economics: types of start-ups and the steps involved in setting them up. The material covers the role of business, the operating system of functioning enterprises, production, and services. It discusses the assets of businesses, the essence and role of planning in the life of businesses, and issues of corporate culture. It examines the economic and financial results of corporate operations, the management of changes and crises, and finally the transformation and termination of businesses.							
Typical delivery methods				**Theoretical**		In a classroom with the use of projector or computer in each lecture.					
				Practice		Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work					
				Lab		-					
Requirements				**Knowledge** • Understands the conceptual framework of corporate management. • Is familiar with corporate assets, the essence of planning, and its role in the life of a business. • Is familiar with change and crisis management, as well as the tasks involved in restructuring and liquidating businesses.							
				Ability • Able to use the concepts of the field professionally. • Able to evaluate business assets. • Able to manage corporate changes and crises.							
				Attitude • Open to actively interpreting changing communication communities and social situations. • Sensitive to solving problems arising from the functioning of relationships. • Receptive to exploiting opportunities for development.							
				Autonomy and responsibility • Takes responsibility for their own development. • Cooperates with others, seeks solutions to problems. • Feels responsible for the development of their work environment.							
Brief description of the subject content				Becoming an entrepreneur, successes, failures, experiences in the life of companies. The concept, essence, necessity, implementation, and embeddedness of business. The role, types, operation, life cycle, business plan preparation, decline, transformation, and termination of businesses. Success as a motivational factor.							
Activity forms of students				Individual and group activities:							

	participation in individual and small group tasks, participation in guided business role-playing, analysis of case studies, examination of complex business simulations.
Compulsory reading and its availability	• Sloman, John - Kevin Hinde - Dean Garratt (2013) Economics for business. Pearson, DUE Library • Materials on MOODLE
Recommended reading and its availability	• Paul Keat; Philip K Young; Steve Erfle (2013): Managerial Economics (7th Edition), Prentice Hall, ISBN : 0133020266, DUE Library
Hand-in Assignments/ measurement reports	
Description of midterm tests	
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Mathematics 3.

Title of the subject	Hungarian		Matematika 3					Level	BSc	
	English		Mathematics 3					Code	DUEN(L) -IMA- 110	
Responsible Academic Unit			Institute of Information Technology							
Compulsory prerequisite subject:			IMA-152 Engineering Mathematics 1.							
Type		Lecture		Seminar		Lab		Requirements	Credit	Language of instruction
Full time		Per semester	0	Per semester	45		0	Midterm Mark	5	English
Part time		Per semester	0	Per semester	15		0			
Person responsible for the subject:			name:		Zoltán Papp, Dr.			position:	Associate professor	
Lecturer:			name:		Zoltán Papp, Dr.			position:	Associate professor	

Course objectives and justification (content, learning outcomes, place in curriculum)	Objectives and development goals The aim of the course is to acquire and deepen the mathematical and function-theoretic foundations that are essential for understanding and applying the professional subjects. Students broaden their mathematical knowledge for the independent study of the literature, and they become familiar with the key relationships and conceptual frameworks necessary for working in the field. The course also develops applied mathematical thinking. The course builds on the foundations of analysis and function theory: limits, continuity, differentiation, basic integration methods, as well as fundamental function types and their analysis. Students are expected to be familiar with basic mathematical notation, computational techniques, and elementary problem-solving steps. The aim of the course is to deepen and extend students' mathematical knowledge toward analytical and differential-equation methods needed for understanding and applying algorithms, modelling tasks, data processing, and engineering computations. It develops students' abstract thinking, modelling skills, and problem-solving abilities, with particular emphasis on the applications of multivariable functions, numerical procedures, and differential equations in computer science. The course supports independent learning and the development of students' analytical thinking, which are indispensable for later professional subjects.
Typical lesson types:	Lecture: - Seminar: Instruction is conducted entirely in practical sessions, involving guided problem-solving, small-group or pair-based activities, and collective solution analysis. The emphasis is placed on the application of methods, the articulation and refinement of problem-solving strategies, and the provision of immediate feedback. Lab: - Other:
Requirements (in learning outcomes)	Knowledge • The student possesses the theoretical foundations and methodological tools of differential and integral calculus, as well as differential equations, that are required for the mathematical modelling and analysis of engineering problems. • They have a clear understanding of the essential concepts, relationships, and computational techniques associated with multivariable functions, numerical procedures, and geometrical applications. • They command a comprehensive system of theoretical and practical knowledge related to the topics of the course, forming a solid basis for algorithmic thinking, engineering computations, and the acquisition of subsequent technical subjects.

	• The student understands the engineering applications of the methods studied, such as numerical solution techniques, model construction, and the mathematical description of processes, and recognizes their role in problem-solving and data-processing workflows.
	Skills • The student is able to apply differential and integral calculus, as well as numerical methods, in the modelling and analysis of engineering problems. • They employ techniques of multivariable analysis, numerical integration, and the solution of differential equations in algorithmic reasoning, data-processing tasks, and simulation workflows. • They are capable of identifying and selecting the appropriate mathematical method in accordance with the nature of a given engineering problem (e.g., optimization, approximation, process modelling); they develop problem-solving strategies independently and are able to justify their choices with sound professional reasoning. • The student is proficient in the use of mathematical and computational tools (e.g., computer algebra systems, numerical computing environments) throughout the problem-solving process, and they can compare and evaluate the efficiency and applicability conditions of different solution methods.
	Attitude • The student is open to methodological innovations and developments in mathematics and engineering, and demonstrates a willingness to engage with modern analytical and numerical techniques. • They strive for precise, logical, and transparent reasoning, as well as for the consistent use of formal mathematical notation. • The student shows an active interest in the connections between mathematical modelling and engineering sciences. • They maintain a positive attitude toward collaboration, joint problem-solving, and professional dialogue. • Furthermore, they appreciate the role of mathematical methods in ensuring the reliability, optimisability, and efficient operation of engineering systems.
	Autonomy and responsibility • The student selects mathematical methods and tools responsibly, in accordance with the nature of the given task. • They carry out mathematical analyses, model construction, and computational work independently, interpret the obtained results, and verify their reliability. • They assume responsibility for the accuracy of their own work, including the identification and correction of errors. • The student is capable of making professionally grounded decisions and justifying them through mathematical reasoning. • They collaborate effectively in an information-technology project environment with peers and professionals, particularly in tasks that involve developments based on mathematical analysis or modelling.
Short description of subject content	Special differentiation rules. Geometric applications of differential calculus. Area calculation. Volume and surface area of solids of revolution. Arc-length and centroid calculations. Multiple integrals. Numerical integration. Solution of nonlinear equations. Separable and reducible differential equations. First-order and second-order linear differential equations. Reduced (incomplete) second-order differential equations.
Forms of student activity	Guided processing of theoretical material. Independent study of theoretical content. Guided problem-solving. Independent completion of problem-solving tasks. Text comprehension. Individual and group-based information processing. Articulation and discussion of differing viewpoints. Development of debating skills and argumentation techniques. Collaboration within a group.
Required reading and resources	• Frank Ayres JR., Elliott Mendelson: Theory and Problems of Differential and Integral Calculus, McGraw-Hill, 1990, ISBN: 0-07-002662-9

	• Robert C. Wrede, Murray Spiegel: Theory and Problems of Advanced Calculus, Schaumn's Outline Series, McGraw-Hill, 2002
Recommended reading and resources	• Smith, R. T., Minton, R. B.: Calculus: Early transcendental functions, 4th edition, McGraw Hill, New York, 2012
Assignments	As discussed during the first session.
Description and schedule of exams	Full-time students are required to complete four in-class assessments, administered in Weeks 3, 6, 9, and 12. Each assessment carries a maximum of 25 points. The tests consist of theoretical questions and problem-solving tasks. Students must achieve at least 50% of the available points on each individual assessment, and the combined score of the two assessments must reach at least 51% of the total possible points. Part-time students are required to complete two in-class assessments. Each assessment carries a maximum of 50 points. Students must achieve at least 50% of the available points on each individual assessment, and the combined score of the two assessments must reach at least 51% of the total possible points.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence (AI) is partially permitted in this course. Students may use AI-based tools exclusively for the purpose of understanding the course material, independently processing theoretical content, and practising problem-solving techniques. This includes requesting explanations, visualizations, supporting examples, or alternative solution approaches. Permitted uses of AI include: – supporting the comprehension of theoretical material (explanations, supplementary examples); – checking practice exercises and exploring possible solution approaches; – assisting autonomous learning processes (e.g., conceptual clarification, visualization). Prohibited uses of AI: AI may not be used in any context that affects the evaluation of semester performance. It is strictly forbidden to: – use AI during in-class assessments, make-up tests, or retakes; – generate or revise homework, assignments, or any work submitted for evaluation using AI; – substitute in-class problem-solving with AI assistance; – automatically generate solutions or solution plans using AI tools.

Technology of Structural Materials

Subject name		Hungarian		Szerkezeti anyagok technológiája						Level		A	
		English		Technology of Structural Materials						Code		DUEN(L)-MUA-116	
Responsible educational unit				Institute of Engineering									
Name of prerequisite subject				DUEN-MUA-216									
Type		Class hours / week								Requirements		ECTS	Language of instruction
		Theoretical		Practice			Lab						
Full time course	150/39		1		0			2		M		5	English
Long distance course	150/15	per Semester	5	per Semester	0		per Semester	10					
Teacher responsible for subject				Name			Dr. Zsolt Csepeli			Position		College Teacher	
Educational goal (competencies to be acquired)				The aim is that the students be able to select the materials and production technologies that are the most suitable for a given objective. The students learn the manufacturing, properties, application and property modification technologies (alloying, melting, plastic deformation, heat treatment, surface treatment), melting and forming technologies of the most important metallic and non-metallic structural materials. The students learn most important welding technologies and their application.									
Typical transfer ways				Theoretical			In a classroom with the use of projector or computer in each lecture.						
				Practice									
				Lab			In a classroom with the use of projector or computer in each seminar.						
Requirements (expressed in educational results)				**Knowledge** Students will know the basic terms of matherial structures know the Phase diagrams and transformations know the steel production methods know the steel applications									
				Ability They are able to use the obtained skills even few years later, in real situations									
				Attitude Open-minded for the mechanical innovation on their field.									
				Autonomy and Responsibility Responsible for their results.									
Brief description of the subject content				Phase diagrams. The Fe-Fe3C equilibrium phase diagram. Phase transformations. Steel production. Basic oxygen steelmaking. Electric arc furnace. Continuous casting. Steel processing. Hot rolling. Cold rolling. Forging. Casting. Heat treatment of steels. Mechanical properties. Strengthening mechanisms. Steel applications Sustainability (steel and the environment, principles of life cycle thinking). Aluminum production and processing. Properties of aluminum. Heat treatment of aluminum. Case studies for the industrial application of aluminum.									
Forms of student activity				Understanding and assimilation of the topics of presentations 50% Testing of materials 30% Laboratory excercises 20%									
Compulsory reading and its availability				1. William D. Callister: Materials Science and Engineering, An Introduction, 2007, Wiley 2. www.steeluniversity.com 3. www.alumatter.info									

Recommended reading and its availability	4. ASM Metals Handbook Desk Edition 2001 5. ASM Metals Handbook Volume 14 - Forming And Forging 6. core.materials.ac.uk
Description of tasks/measurement reports to be submitted	As mentioned in the first class, you will be required to submit a paper during the semester.
Description of closed places, time schedule	As stated in the first lesson
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: it may be applied for the preparation of in-class assignments (organizing information related to the manufacturing technologies, properties, application areas, and structure–property relationships of metallic and non-metallic structural materials), as well as for developing the structure or improving the linguistic quality of submitted reports and written assignments. Students must ensure that all submitted professional content—particularly the interpretation of material-production and processing methods, the analysis of material properties, the justification of technological decisions, and the formulation of conclusions—reflects their own, verifiable work. During midterm tests, examinations, and all forms of individual assessment, the use of artificial intelligence in any form is strictly prohibited.

Mechanics I.

<table>
<tr><td colspan="2" rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="4">Mechanika 1.</td><td>Level</td><td>FOSZK, BSc</td></tr>
<tr><td>In English</td><td colspan="4">Mechanics 1.</td><td>Code</td><td>DUEN(L)-MUG-152</td></tr>
<tr><td colspan="9">Responsible educational unit</td></tr>
<tr><td colspan="2">Compulsory prerequisite subject:</td><td colspan="7">Institute of Engineering</td></tr>
<tr><td colspan="2">Type</td><td colspan="7"></td></tr>
<tr><td colspan="2">Type
Full time</td><td colspan="4">Number of lessons</td><td rowspan="2">Requirement</td><td rowspan="2">Credit</td><td rowspan="2">Language of education</td></tr>
<tr><td colspan="2"></td><td colspan="2">Lecture</td><td colspan="2">Seminar</td><td colspan="2">Lab</td></tr>
<tr><td>Part time</td><td>150/60</td><td>Per week</td><td>2</td><td>Per week</td><td>2</td><td>Per week</td><td>0</td><td rowspan="2">V</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Person responsible for the subject:</td><td>150/15</td><td>Per semester</td><td>10</td><td>Per semester</td><td>10</td><td>Per semester</td><td>0</td></tr>
<tr><td colspan="3">Course objectives and justification (content, learning outcomes, place in curriculum)</td><td colspan="2">name</td><td colspan="3">Gábor Ladányi</td><td>position</td><td>master teacher</td></tr>
<tr><td colspan="3" rowspan="2">Course objectives and justification (content, learning outcomes, place in curriculum)
Typical delivery methods</td><td colspan="7">Short-term objective
By applying the concepts and relationships presented in the lectures in the exercises and during home preparation, the student will master the mechanical foundations of the design of simple engineering structures. He will become familiar with the conceptual system of statics and strength theory and the relationships applied in practice..</td></tr>
<tr><td colspan="7">Objectives and development goals</td></tr>
<tr><td colspan="3" rowspan="4">Typical delivery methods
Requirements
(in learning outcomes)</td><td>Lecture</td><td colspan="6">Presentation with whiteboard and projector</td></tr>
<tr><td>Seminar</td><td colspan="6">Blackboard practice, partly with independent student problem solving</td></tr>
<tr><td>Lab</td><td colspan="6">-</td></tr>
<tr><td>Other</td><td colspan="6">-</td></tr>
<tr><td colspan="3" rowspan="4">Requirements
(in learning outcomes)</td><td colspan="7">Knowledge
• By applying the concepts and relationships presented in lectures in exercises and during home preparation, the student will master the mechanical foundations of the design of simple engineering structures.
• He will become familiar with the conceptual system of statics and strength theory and the relationships applied in practice.</td></tr>
<tr><td colspan="7">Ability
• The student will be able to design and construct mechanical components, machines, devices, equipment, and structures in terms of statics and strength.</td></tr>
<tr><td colspan="7">Attitude
• Mastering the design and strength theory approach to machine elements, machines, devices, equipment</td></tr>
<tr><td colspan="7">Autonomy and responsibility
• Learning and applying the responsibilities and regulations of engineering design. Mastering the rules of group cooperation.</td></tr>
<tr><td colspan="3">Short description of subject content</td><td colspan="7">Statics of a material point: concept of vector, operations with vectors. Force, force system, equilibrium. Statics of rigid bodies: concept of rigid body. Concept of moment. Equivalence and reduction of force systems. Resultant concept. Equilibrium of a rigid body. Ideal constraints. Definition of support systems in the case of spatial and planar force systems. Statics of supports: concept of support elements, supports and constraints, internal forces and stresses and the principle of</td></tr>
</table>

	their definition, relationships between stresses. Fundamentals of strength theory: basic concepts, division, methods of strength theory, purpose of strength tests, requirements imposed on structural elements, the rupture diagram and the mechanical characteristics that can be determined from it. Determination of mechanical stresses in the case of simple stresses. Concept and definition of stress state. Evaluation of stress state, principal stresses, principal stress directions. Elements of deformation state: specific strains and angular distortions. Evaluation of deformation state. Relationship between elements of deformation and stress state. Concept and theories of equivalent stress.
Types of student activity	Image plane, coordinate system, projection. Representation of a point, real and point image of a line. Projection and the law of change of view. Mutual positions of spatial elements. Projections depending on their straight positions, diverging and intersecting lines. Transversals, notable lines of a plane. True size of a plane figure, constructions with rotation. Intersection line of two planes, angles of inclination, distances. Solving problems with basic constructions. Basic standards of technical drawing design. Theoretical overview of projection systems in technical practice. Application of views, view orders. Application of sections and sections. Dimensioning on technical drawings. Dimension grids.
Required reading and resources	Processing theoretical material with guidance/independently: 15/35% Solving problems with guidance/independently: 15/35%
Compulsory reading and resources	1. Ladányi Gábor: Mechanika 1., Elektronikus jegyzet, Dunaújvárosi Egyetem, 2020 **2.** Dr. Vigh Sándor- Szlávik Béláné- Dr. Izsák Gyula: Műszaki mechanika I. Példatár: 1. rész. Dunaújváros, DF Kiadói Hivatal, 2000. **3.** Dr Vigh S. szerk. Műszaki mechanika II. Példatár II/A, főiskolai jegyzet. DF Kiadó, Dunaújváros, 2000.
Recommended reading and resources	1. Dr. M. Csizmadia Béla-Dr. Nándori Ernő-: Mechanika mérnököknek. Statika. Budapest, Nemzeti Tankönyvkiadó, 1998. 510 p. 2. Dr. M. Csizmadia Béla-Dr. Nándori Ernő-: Mechanika mérnököknek. Szilárdságtan Nemzeti Tankönyvkiadó, 1998. 510 p. 3. Dr Vigh S. Műszaki mechanika IV. Keresztmetszeti jellemzők. Főiskolai jegyzet. DF Kiadó, Dunaújváros, 1998.
Assignments	Compulsory homework: 1. 3rd week Resultant of a spatial force system 2. 6th week Support forces of a two-support beam 3. 8th week Stresses of a two-support, cantilever beam 4. 11th week Strength design of a beam subjected to straight bending Optional homework: 1. 2nd week Operations with vectors 2. 4th week Resultant of a plane force system 3. 7th week Construction of a dough bridge 4. 10th week Determination of the support forces of a statically indeterminate suspended beam 5. 13th week Strength check of a beam subjected to oblique bending
Description and schedule of exams	according to what was said in the first lesson
Framework and rules for the use of artificial intelligence	The use of artificial intelligence tools is partially permitted during the acquisition of the subject: • the use of artificial intelligence tools is permitted during the development of homework assignments. The student is responsible for the content and form of the solution of the assignments and if it does not meet the expectations, the homework is invalid. • the use of artificial intelligence tools in any form during the verification of the student's knowledge (exam papers, exams) is not permitted.
Conditions and formation of the result	Conditions for obtaining the signature (examination right): • Completing the mandatory homework assignments to an acceptable level and on time. In justified cases, the practice leader may grant a 1-week extension. • Attending 70% of lectures • Attending 80% of exercises

	Conditions for obtaining the offered grade: • Obtaining the signature. • Completing at least one of the homework assignments to an acceptable level and on time. Possibilities for obtaining the grade: a. The sum of the points that can be obtained from the mandatory homework assignments (max. 40 points) and the points that can be obtained from the homework assignments (max. 40 points). b. Successful participation in the exam: Assessment of the basic questions of the theoretical curriculum and the ability to solve examples from the entire curriculum in writing. Theoretical questions related to the assignments orally. The ratio of practical and theoretical questions in the exam paper is approximately 2/3 –1/3. A maximum of 80 points can be awarded for the exam paper. The grade is determined by: a. a grade offered based on points earned from homework or b. based on points earned in the exam according to the TVSZ.
Frameworks and rules for the use of artificial intelligence	The use of artificial intelligence tools is partially permitted during the acquisition of the subject: the use of artificial intelligence tools is permitted during the development of homework assignments. The student is responsible for the content and form of the solution of the assignments and if it does not meet the expectations, the homework is invalid. the use of artificial intelligence tools in any form during the verification of the student's knowledge (exam papers, exams) is not permitted.

CAD

<table>
<tr><td colspan="2" rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="4">CAD</td><td>Level</td><td>BSc</td></tr>
<tr><td>In English</td><td colspan="4">CAD</td><td>Code</td><td>DUEN(L)-MUG-212</td></tr>
<tr><td colspan="9">2023/2024 I.</td></tr>
<tr><td colspan="3">Responsible educational unit</td><td colspan="6">Institute of Engineering</td></tr>
<tr><td colspan="3">Compulsory prerequisite subject:</td><td colspan="6">-</td></tr>
<tr><td colspan="2" rowspan="2">Type</td><td colspan="2" rowspan="2">Number of lessons</td><td colspan="4" rowspan="2"></td><td rowspan="2">Requirement</td><td rowspan="2">Credit</td><td rowspan="2">Language of education</td></tr>
<tr></tr>
<tr><td></td><td></td><td>Lecture</td><td></td><td>Seminar</td><td></td><td>Lab</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Full time</td><td>150/60</td><td>Per week</td><td>0</td><td>Per week</td><td>0</td><td>Per week</td><td>3</td><td rowspan="2">F</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Part time</td><td>150/15</td><td>Per semester</td><td>0</td><td>Per semester</td><td>0</td><td>Per semester</td><td>15</td></tr>
<tr><td colspan="3">Person responsible for the subject:</td><td>name</td><td colspan="3">Tamás Zahola</td><td>position</td><td colspan="2">master instructor</td></tr>
<tr><td colspan="3" rowspan="2">Course objectives and justification (content, learning outcomes, place in curriculum)</td><td colspan="6">Short-term objective
Acquire the basic knowledge of computer-aided mechanical design</td></tr>
<tr><td colspan="6">Objectives and development goals

The student should be familiar with the practice of computer geometric modelling. Be able to build parametric geometric models of components that "survive" construction changes and contain the designer's intention. Be able to select the optimal modelling sequence and method for the given task from among several possible ones. Be able to build an assembly from the created components. Be able to have technical drawings of components and assemblies produced that best comply with the requirements of the valid drawing standards.</td></tr>
<tr><td colspan="3" rowspan="4">Typical delivery methods</td><td>Lecture</td><td colspan="5">-</td></tr>
<tr><td>Seminar</td><td colspan="5">-</td></tr>
<tr><td>Lab</td><td colspan="5">Computer lab practice</td></tr>
<tr><td>Other</td><td colspan="5">-</td></tr>
<tr><td colspan="3" rowspan="4">Requirements
(in learning outcomes)</td><td colspan="6">Knowledge

• Can apply the related calculation and modelling principles and methods of mechanical product, process and technological design.</td></tr>
<tr><td colspan="6">Ability
• Able to plan, organize and conduct independent learning.
• Able to create basic models of technical systems and processes.</td></tr>
<tr><td colspan="6">Attitude
• Open to learning about and embracing developments related to their qualifications and field of expertise. Interested in new methods and tools related to their field of expertise.</td></tr>
<tr><td colspan="6">Autonomy and responsibility
• Taking responsibility for one's own work and the work of others.</td></tr>
<tr><td colspan="3">Short description of subject content</td><td colspan="6">In computer laboratory sessions, the student will learn the practice of computer geometric modelling through the application of a modern, parametric modeling system (SolidWorks). He will master the use of the commands necessary for the creation of machine parts. He will learn how to build assemblies. He will be prepared to create technical drawing documentation that best complies with the current standards in his engineering work based on the previously built part and assembly models.</td></tr>
<tr><td colspan="3">Types of student activity</td><td colspan="6">Processing theoretical material with guidance 20%
Independent processing of theoretical material 20%
Solving tasks with guidance 20%
Independent processing of tasks 40%</td></tr>
<tr><td colspan="3">Required reading and resources</td><td colspan="6">Tamás Zahola: CAD – Workbook
SolidWorks Online Help</td></tr>
</table>

Recommended reading and resources	Descriptions and documentation related to the SolidWorks program system
Assignments	-
Description and schedule of exams	Week 6: Part Modelling Week 9: Assembly Creation Week 13: Technical Drawing Creation
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is permitted in all situations during the learning process of the subject. It is the student's responsibility to verify the correctness of the results obtained.

Basics of Finance

<table>
<tr><td colspan="2" rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="3">Pénzügytan alapjai</td><td>Level</td><td>A</td></tr>
<tr><td>In English</td><td colspan="3">Basic of Finance</td><td></td><td>DUEN(L)-TKT-114</td></tr>
<tr><td colspan="2">Subject code</td><td colspan="5"></td></tr>
<tr><td colspan="2">Responsible educational unit</td><td colspan="5">Institute for Social Sciences
Department of Economics and Management</td></tr>
<tr><td colspan="2">Name of Mandatory Preliminary Study</td><td colspan="5"></td></tr>
<tr><td colspan="3" rowspan="2">Number of Lessons</td><td colspan="3" rowspan="2">Requirements</td><td rowspan="2">Credits (ECTS)</td><td rowspan="2">Language of Education</td></tr>
<tr><td></td><td>Theoretical</td><td>Practice</td><td>Lab</td></tr>
<tr><td>Full-time</td><td>150/39</td><td></td><td>1</td><td></td><td>2</td><td></td><td>0</td><td rowspan="2">M (Midterm mark)</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td></td><td>5</td><td></td><td>10</td><td></td><td>0</td></tr>
<tr><td colspan="2">Teacher responsible for the course</td><td>Name</td><td colspan="3">Dr. Andrea Keszi-Szeremlei</td><td>Position</td><td>College Teacher</td></tr>
<tr><td colspan="2">Educational goals</td><td colspan="6">By the end of the course, students will be familiar with the interrelationships between economic policy and fiscal policy, the functioning of the banking system, the players in the stock market, and the characteristics of stock market operations. They will have the basic knowledge necessary to understand domestic and international financial processes. They will know and understand the differences in risk between basic investment opportunities. They will see the connections between international and domestic financial processes. They will have the basic financial tools necessary to perform financial calculations.</td></tr>
<tr><td colspan="2" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="5">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="5">In a classroom with the use of projector or computer in each seminar.</td></tr>
<tr><td>Lab</td><td colspan="5"></td></tr>
<tr><td colspan="2" rowspan="4">Requirements (expressed in learning outcomes/competencies to be acquired)</td><td colspan="6">Knowledge
• Knows the basic concepts of finance.
• Knows the fundamental, comprehensive facts, directions, and limits of finance and financial matters.
• Knows the most important connections, theories, and terminology in the field.
• Knows the terminology, types, and basic principles of financial markets, institutions, and decisions, as well as the steps for effective financial performance measurement.</td></tr>
<tr><td colspan="6">Ability
• Is capable of basic analysis of the concepts that make up the knowledge system of finance, synthetic formulation of connections, and adequate evaluation.
• Able to collect and analyze financial information
• Able to make financial decisions in their professional and private life
• Able to apply the professional experience gained in their economic, business, and financial activities to improve the effectiveness of their financial decisions and activities.</td></tr>
<tr><td colspan="6">Attitude
• Open to communicating and conveying the fundamental characteristics of comprehensive thinking and practical operation in their profession.
• A desire for continuous self-improvement in the field of finance
• Open and willing to discuss all aspects of financial issues that arise in the course of their work and to express their opinion without disclosing sensitive information about the economic, business, and financial situation of the company or institution where they work.</td></tr>
<tr><td colspan="6">Autonomy and responsibility</td></tr>
</table>

	• Independently thinks through comprehensive, fundamental professional issues and considers them based on the available resources. • Characterized by cooperation and responsibility with qualified professionals in the given field. • Understands complex financial situations in professional financial matters and plays a decision-making role. • Is able to solve basic financial problems independently. • Handles problems responsibly and is able to decide whether cooperation with others is necessary in a given financial situation.
Brief description of the subject content	The concept, role, characteristics, and decisive importance of economic policy in terms of economic development. The connections and characteristics of economic policy and fiscal policy in specific areas and their specific features. The concept and characteristics of public finances, the concept of public administration, its subsystems, and their cooperative system. Budget revenues and expenditures. The characteristics and instruments of fiscal policy. Money and money creation, money supply and money demand. Issues of modern monetary management, theoretical concepts of inflation, possible causes of inflation. The concept, types, tasks, significance, and place of banks and banking systems in the economy. Regulation, structure, and operation of the current Hungarian banking system. The role and tasks of the central bank, the system and instruments of monetary management. The operations and risks of commercial banks. The concept, groups, forms, operation, and instruments of money markets, capital markets, and securities markets. Securities: stocks and bonds; other securities. Concentrated markets and their operation, the concept, characteristics, and regulation of stock exchange trading. Stock exchange participants, characteristics of stock exchange operation. The concept, types, classification, characteristics and application of stock exchange transactions. Types of transactions, stock exchange participants The international financial system: money and capital flows. The origin of debts and claims, the realization of settlement. Means of settlement: the concept, characteristics, and groups of currencies and foreign exchange and their characteristics. Measuring monetary relations between countries: indicator system and balance of payments structure and international settlements. Balance of payments equilibrium and imbalance, debt and its management. Lending with the help of the financial market system and the institutions of the international financial system. Members of the international financial system: IMF, IBRD group. The formation of the European Union, its characteristics, organizational structure, and financial institutions.
Activity forms of students	Processing theoretical material under supervision 17% Independent processing of theoretical material 17% Task completion under supervision 17% Independent task completion 49%
Compulsory reading and its availability	Lecturer's notes available on MOODLE Study materials provided on MOODLE
Recommended reading and its availability	• Pamela Peterson –Drake-Frank J.Fabozzi: The Basics of Finance, An Introduction to Financial Markets, Business Finance and Portfolio Management, The Frank J.Fabozzi Series, 665 pages, Wiley Online Library, Elérhető: http://elib.peaceland.edu.ng:8383/greenstone3/sites/localsite/collect/peacelan/index/assoc/HASHc0b1.dir/doc.pdf • Eddie McLaney- Business Finance, Theory and Practice, 8th Edition, Pearson Education, Letölthető: http://www.books.mec.biz/tmp/books/E58R5U5EUTFE1SF8SBF3ZSBVUI16N6.pdf • Dahlquist,J. – Knight, R. (2022): Principles of Finance – egyes fejezetei, bit.ly/4aeJZiV • Kürthy G. (2018): Basic of Finance, Corvinus University, egyes fejezetei - bit.ly/46lflTK
Hand-in Assignments/ measurement reports	• 10 Homeworks (from the theoretical and practical material covered in class. Value: 5 points/HF (max. 50 points) (Deadline: as specified in Neptun) • Oral exam: basic financial concepts – weeks 12-13
Description of midterm	Three short tests will be written during the semester

tests	1. Short test: practical tasks from weeks 1-6 – week 7 (10 points) (make-up date: between weeks 9-12) 2. Short test: practical tasks from weeks 7-12 – week 13 (15 points) (make-up date: weeks 13-14) 3. Short test: theoretical material from weeks 1-12: test, true/false, concepts, other theoretical tasks, questions – week 13. (25 points) (make-up date: weeks 13-14)
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Management

<table>
<tr><td rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="4">Menedzsment</td><td>Level</td><td>A</td></tr>
<tr><td>In English</td><td colspan="4">Management</td><td></td><td>DUEN(L)-TVV-114</td></tr>
<tr><td colspan="2">Subject code</td><td colspan="6"></td></tr>
<tr><td colspan="2">Responsible educational unit</td><td colspan="6">Institute for Social Sciences
Department of Management and Enterprise Sciences</td></tr>
<tr><td colspan="2">Name of Mandatory Preliminary Study</td><td colspan="6"></td></tr>
<tr><td colspan="3">Number of Lessons</td><td colspan="3" rowspan="2">Requirements</td><td>Credits (ECTS)</td><td>Language of Education</td></tr>
<tr><td></td><td>Theoretical</td><td>Practice</td><td>Lab</td><td></td><td></td></tr>
<tr><td>Full-time</td><td>150/39</td><td>1</td><td>2</td><td>0</td><td rowspan="2">M</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td>5</td><td>10</td><td>0</td></tr>
<tr><td colspan="2">Teacher responsible for the course</td><td>Name</td><td colspan="2">Dr. habil Mónika Rajcsányi-Molnár</td><td>Position</td><td>College professor</td></tr>
<tr><td colspan="2">Educational goals</td><td colspan="6">The module provides a comprehensive understanding of management in theory and in practice.
The course is designed to familiarize students with the most important information for the management of labor organizations, to provide insight into the "special" management dimensions, and those determinants.</td></tr>
<tr><td colspan="2" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="5">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="5">In a classroom with the use of projector or computer in each seminar.</td></tr>
<tr><td>Lab</td><td colspan="5"></td></tr>
<tr><td colspan="2" rowspan="3">Requirements</td><td colspan="6">Knowledge
Students as potential manager:
• Familiar with the fundamental aspects of science organization, the most important concepts, requirements, relationships and procedures.
• It learns supply management tasks, theoretical and methodological foundations of the exercise of the functions.
• Familiar with the planning, organization and management frequently used procedures and methods.
• Familiar with the leadership style models and understand their role in effective leadership behavior.</td></tr>
<tr><td colspan="6">Ability
Students will be able to:
• analyse and develop the management and decision making mechanisms of work organizations
• effectively organize individual and team work
• identify and solve problems
• integrate knowledge
• recognize and evaluate alternatives
• handle operative planning tasks
• work in groups
• accept divergent views
• manage time
• select and focus on various tasks
• identify, understand and apply different leadership styles
• understand and manage organizational processes</td></tr>
<tr><td colspan="6">Attitude
• Open to accommodate new innovative approaches.
• Avoids the stereotypes.
• Not think schemas.
• Susceptible development opportunities for exploitation.</td></tr>
</table>

	• Good, future-oriented bargainers respect their counterpart, are trustworthy and not aggressive. • They are open and willing to discuss all points of the negotiation process, as well as express their opinion, but without disclosing any important information about the circumstances of their own company.
	Autonomy and responsibility • In professional questions negotiators can play the role of a decision-maker and are able to solve problems alone. • They can tackle problems as responsible persons, i.e. can decide if it is a need in a certain negotiation phase or situation to cooperate with others.
Brief description of the subject content	Interpretation and origin of management. The role and importance of management in the governance of companies. Historical overview of management studies: concepts, schools, trends; similarities and differences. Practicing management functions: - Planning: vision of the future, goal hierarchy, short term and operative planning, planning methods. - Organizing: changing the structure, processes, defining organizations, division of labor, developing processes and organizational structures, structural differences of organizations, organization types and characteristics. - Control: changing conditions, exercise authority, define norms, measurement, evaluation and adjusting, managing everyday problems. - Coordinating: harmonizing goals-processes-organization, coordination tools, operation control, task-authority-responsibility fit, control processes of organizations: rules of organization and operation, professional rules and regulations, job description. - Leadership: leadership effectiveness, leadership styles: characteristics, decision making theories, behavioral theories, contingency-approach. Organizational culture and strategy. Components and dimensions of culture. Understanding and analyzing cultural differences. Managing corporate culture.
Activity forms of students	Frontal work: 30 % Individual presentation 20% Group work: 35% Test: 15%
Compulsory reading and its availability	• Louis A. Allen and Keith Davis (2013) Management and Organization : McGraw-Hill Series in Management • Williams-DuBrin-Sisk (1995):Management & Organization, South-Western Publishing Co. Cincinnati, Ohio, USA • Materials on Moodle
Recommended reading and its availability	• Chelsom-Payne-Reavill (2005): Management for Engineers, Scientists and Technologists, John Wiley& sons, Ltd, England
Hand-in Assignments/ measurement reports	Case study analysis Group work Individual presentation: An organization working goal, process and organizational structure These tasks cannot be replaced during the exams.
Description of midterm tests	Test
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Basics of machine design

Subject name		In Hungarian	**Géptervezés alapjai**						Level	BSc	
		In English	**Basics of machine design**						Code	**DUEN(L)-MUG-222**	
2023/2024 I.											
Responsible educational unit			**Institute of Engineering**								
Compulsory prerequisite subject:			DUEx-MUG-212 CAD DUEx-MUG-152 Mechanics 1. DUEx-MGT-111 Engineering description								
Type		Number of lessons						Requirement	Credit	Language of education	
		Lecture		Seminar		Lab					
Full time	150/60	Per week	**2**	Per week	**1**	Per week	**0**	**V**	**5**	**English**	
Part time	150/15	Per semester	**10**	Per semester	**5**	Per semester	**0**				
Person responsible for the subject:				name		Tamás Zahola			position	master instructor	
Course objectives and justification (content, learning outcomes, place in curriculum)				**Short-term objective** Introducing the basic principles and methods of mechanical design **Objectives and development goals** The student should know the structure and operation of typical machine parts, machine elements, assemblies, and subassemblies encountered in mechanical engineering practice. Be able to select standard parts of such units, determine the main dimensions, and construct related parts. Be able to prepare drawing documentation of units using traditional and computer tools. The student should be able to apply what he/she has learned in the subjects Mechanical Engineering I, CAD, and Mechanics I to construct simple constructions and subassemblies.							
Typical delivery methods				Lecture	Transferring theoretical knowledge through presentation						
				Seminar	Problem solving with teacher guidance, homework consultation						
				Lab	-						
				Other	-						
Requirements (in learning outcomes)				**Knowledge** • Has a comprehensive knowledge of the basic facts, directions and boundaries of the subject area of the technical field. • Has a knowledge of the conceptual system, the most important relationships and theories related to his/her field. • Has a comprehensive knowledge of the knowledge acquisition and problem-solving methods of the main theories of his/her field. Has a basic knowledge of the principles and methods of machine design, mechanical engineering and control engineering procedures and operating processes. • Has a comprehensive knowledge of the operating principles and structural units of the applied work and power machines, mechanical equipment and devices. • Has a thorough knowledge of the learning, knowledge acquisition and data collection methods of the mechanical engineering field, their ethical limitations and problem-solving techniques.							

	• Can interpret, characterize and model the structure and operation of the structural units and elements of mechanical systems, the design and relationship of the applied system elements. • Can apply the related calculation and modelling principles and methods of mechanical product, process and technological design.
	Ability • Performs a job that is appropriate to his/her qualifications. • Able to plan, organize and carry out independent learning. • Able to identify routine professional problems, explore, formulate and solve them (through the practical application of standard operations) the theoretical and practical background necessary for their solution. • Able to create basic models of technical systems and processes. • Identifies routine professional problems, explores and formulates the theoretical and practical background necessary for their solution, and solves them through the practical application of standard operations.
	Attitude • Open to learning and absorbing knowledge related to mechanical engineering related to his/her qualification and field of expertise. Interested in new methods and tools related to the field.
	Autonomy and responsibility • Taking responsibility for one's own work and the work of others.
Short description of subject content	Parts or units of mechanical equipment that are used repeatedly, perform the same task, and have a similar structural design - machine elements. Conceptual definition, grouping, description, representation, strength dimensioning, correct structural design, operation and maintenance of machine elements. The main machine elements or groups to be discussed in detail are: drive and connecting screws, shafts, shaft joints, couplings, bearings, belt drives, gears. During the discussion of the subject areas, the emphasis is placed on the representation and overview of the parts/units.
Types of student activity	Processing theoretical material with guidance 20% Independent processing of theoretical material 20% Solving tasks with guidance 20% Independent processing of tasks 40%
Required reading and resources	Tamás Zahola: Machine structures II. - Workbook
Recommended reading and resources	-
Assignments	Design task to be completed in group work
Description and schedule of exams	Week 7: Representation of threaded parts, basic principles of strength design Week 13: Machine elements of rotary motion
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is permitted when solving the design task, and it is the student's responsibility to verify the correctness of the solution. No external assistance may be used during closed-door assignments.

Production Technology

Subject name	In Hungarian	Gyártástechnológia							Level	BSc	
	In English	Production technology							Code	DUEN(L)-MUG-252	
2025/2026 II.											
Responsible educational unit		Institute of Technology, Department of Mechanical Engineering and Energy									
Compulsory prerequisite subject:		MUG-152									
Type		Number of lessons							Requirement	Credit	Language of education
		Lecture		Seminar		Lab					
Full time	150/39	Per week	2	Per week	1	Per week	0		V	5	english
Part time	150/15	Per semester	10	Per semester	5	Per semester	0				
Person responsible for the subject:		name				Gábor Vizi, PhD				position	Associate professor
Course objectives and justification (content, learning outcomes, place in curriculum)		**Short-term objective** Acquisition of basic of production technologies									
		Objectives and development goals PLASTIC FORMING PROCESSES Understanding the theoretical basis of plastic forming. Knowledge of plastic forming technologies, production equipment and tools. CUTTING - Understanding the principles and implications of machining - Knowing the basic machining processes - Calculation and selection of process data - Calculation of machine time and standard time and cost – recognition of other machining processes.									
Typical delivery methods		Lecture		For all students, in a large lecture, using a whiteboard, projector or overhead projector							
		Seminar		Small table top exercises for up to 20 people							
		Lab		-							
		Other		-							
Requirements (in learning outcomes)		**Knowledge** • Basic knowledge of machine design principles and methods, machine manufacturing technology, control procedures and operating processes. • Apply the related computational and modelling principles and methods of engineering product, process and technology design.									
		Ability • Cognitive ability, ability to solve problems independently, ability to concentrate on one thing for a long period of time.									
		Attitude • Open to learning and accepting knowledge related to manufacturing technology in their field of expertise. • Interested in new methods and tools related to their field of expertise.									
		Autonomy and responsibility • Taking responsibility for your own work and the work of others.									

Short description of subject content	CUTTING-FREE FORMING PROCESSES Theoretical principles of metal plastic forming. Classification of cutting-free forming processes. Forging, pressing, rolling technology, manufacturing equipment, tools. Seamless pipe manufacturing technology, manufacturing equipment. Sheet metal forming technologies. Punching and cutting technology, machines and tools. Theory, technology, machines and tools of bending. Theory, technology and tools of deep drawing. Cold welding and cold forming processes, tools and machines. Casting technology, processes, manufacturing equipment. MACHINING PROCESSES Machining methods and characteristics of machining. Turning, planing, drilling, milling, grinding. Optimal determination of allowances, feed rates and number of cycles for all types of machining. Calculation of main machine time. Selection of the appropriate machine. Calculation of standard time. Cost analysis. Non-conventional processes. Other cutting processes (drilling, sawing, gear cutting, etc.). Determination of pre-production.
Types of student activity	Processing theoretical material with guidance 5 % Independent processing of theoretical material 40 %, Task solving with guidance 15 % , Independent processing of tasks 40 %
Required reading and resources	• R.K. Rajput: Textbook of Manufacturing technology, LAXMI Publications (P) LTD 113, Golden House, Daryaganj,New Delhi-110002
Recommended reading and resources	• K.C.Jain, A.K. Chitale: Textbook of Production Engineering, PHI Learning Private Limited, New Delhi-110001, 2010
Assignments	...
Description and schedule of exams	Week 7: machining section Week 13: plastic forming section
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is not permitted

Marketing

Subject name	In Hungarian	Marketing							Szintje	A	
	In English	Marketing							Level	A	
Subject code		DUEN-TVV-215									
Responsible educational unit		Institute for Social Sciences Department of Management and Enterprise Sciences									
Name of Mandatory Preliminary Study											
Number of Lessons								Requirements	Credits (ECTS)	Language of Education	
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M	5	English	
Correspondence	150/15		5		10		0				
Teacher responsible for the course		Name				Dr. Catherine Odorige			Position		
Educational goals		The curriculum supports the student's mastery of marketing concepts and highlights their interconnections with different disciplines. During the course, students understand and apply the concepts of the market, the tools of marketing environment analysis, market sharing criteria and methodologies, become familiar with the purchasing decision process and the factors influencing customer behavior. Students understand the diversity and variations of marketing tools, and become proficient in using the most important marketing techniques and institutional marketing communications.									
Typical delivery methods		Theoretical		Flipchart, blackboard and other multimedia equipment in auditorium							
		Practice		Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work.							
		Lab									
Requirements		**Knowledge** • By the end of the semester, students as potential marketing practitioners • comprehend the basic concepts used in marketing and PR • know the basic tools of marketing and recognize the relationships among them • know the elements of an organization’s internal and external environment and their interaction with the company's marketing and PR activities • know and appropriately apply market research methodologies									
		Ability Students will be able to: • Use and apply the basic terms and vocabulary of the profession with confidence • Synthetize and organize their knowledge and apply it in the appropriate situations • Examine business problems with a marketing approach • Analyze the market of a product or service • Detect correlations between strategic and operational marketing processes. • Detect the relationship and interactions between the company, its customers and business partners									
		Attitude Students should be: • Open to classroom case studies, and to the active interpretation of discussed situations. • Sensitive and critical towards theoretical and practical innovation • Susceptible to development opportunities for exploitation.									
		Autonomy and responsibility • Responsible for his/her own development.									

	• Cooperate with the instructor and fellow students, seeks to solve the discussed problems. • Feel responsible for the development of his/her working environment
Brief description of the subject content	Concepts and instruments of marketing, main communication channels and strategies. Components of the marketing mix, market participants, the basic processes of marketing management. Consumer behavior, B2B markets, the basic methods of marketing research. Pricing, product development, brands, branding and challenges of contemporary marketing
Activity forms of students	Case study analysis, Presentations, Individual work, Frontal class work, Group work, Role play
Compulsory reading and its availability	• Kotler, P. – Wong, V. – Saunders, J. – Armstrong, G.: Principles of Marketing, 4th European Edition, Pearson, 2005, DUE Library
Recommended reading and its availability	• Kotler, P. – Armstrong, G.: Marketing: An Introduction, Pearson, 2015 • Kotler, P. – Kartajaya, H. – Setiawan, I.: Marketing 4.0: Moving from traditional to digital, Wiley, 2017 • Palmer, A.: Introduction to marketing, Oxford University Press, 2003
Hand-in Assignments/ measurement reports	Group work (Week 11): Creating and presenting the marketing plan of a chosen company. The marketing plans have to be submitted the day before the presentation the latest. Individual work (Week 7): Students have to analyse their own consumer habits (5-10 pages) and behaviours, and submit it in written form. The essay should contain citations from relevant scientific literature.
Description of midterm tests	The goal of the final test is to assess the students' knowledge and comprehensive understanding on the main marketing concepts, tools and strategies, and to measure and evaluate their knowledge in a system-wide context through complex problem solving. (Week 13.)
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: • during class work, for data collection and research related to assignments • for data collection for certain homework tasks • during preparation for quizzes/exams The use of any AI tools is strictly prohibited during knowledge assessments and the writing of in-class tests (quizzes).

Operations and Quality Management

Subject name	In Hungarian	Termelés és minőségmenedzsment							Szintje	A	
	In English	**Operations and Quality Management**							Level	A	
Subject code		DUEN(L)- TVV-219									
Responsible educational unit		Institute for Social Sciences Department of Economics and Management									
Name of Mandatory Preliminary Study											
Number of Lessons								Requirements	Credits (ECTS)	Language of Education	
		Theoretical		Practice		Lab					
Full-time		1		2		0		M (Midterm mark)	5	English	
Correspondence		5		10		0					
Teacher responsible for the course		Name		Dr Anita Varga					Position		
Educational goals		The aim of the course is to enable students to become familiar with the fundamental concepts of production and quality management and their interrelationships from a systems perspective. Students will gain an overview of the application of the function matrix, the concept and interpretation of production management, as well as the market and technical life cycles of products and technologies. They will learn about the concept of control, its methods, and the triple control loop, as well as the systems-based interpretation of production control and the levels of product structure. Another objective of the course is for students to acquire the basic principles of quality management systems and standards—particularly the MSZ EN ISO 9001 family of standards—as well as the applied methods and techniques of quality management, including "soft" management tools. The course equips students with the ability to effectively manage production and service processes and to operate and develop them in compliance with quality requirements.									
Typical delivery methods		Theoretical	In a classroom with the use of a projector or a computer in each lecture.								
		Practice	In a classroom with the use of a projector or a computer in each seminar.								
		Lab									
Requirements (expressed in learning outcomes/competencies to be acquired)		Kno**wledge** · Knows and understands the principles and methods of managing, organizing, and operating business and production processes, with particular emphasis on production and quality management systems. · Has a comprehensive understanding of the conceptual frameworks of production management and quality management, their mutual interactions, and their role in organizational operations. · Understands the importance of a systems-oriented approach and strategic thinking in the analysis and development of business processes · Is familiar with the operational processes of task-oriented workgroups, as well as the management principles related to their coordination and leadership.									
		Skills · The student is able to apply theoretical and practical knowledge in a structured manner within the production and quality management processes of business organizations. · The student is able to interpret, analyze, and evaluate the elements of business and production systems both independently and in their interrelationships. · The student is able to outline management and control loops, as well as interpret the associated responsibilities and authorities.									

	· The student is able to apply in practice the principles and requirements of the MSZ EN ISO 9001 standards family and to support its basic-level implementation. · The student is able to regulate, document, and improve simpler processes using the tools of quality management. · The student is able to interpret and use the elements of a quality management documentation system. · The student is able to process and interpret professional literature related to the field and apply terminology appropriately.
	Attitude · The student is open to new results, innovations, and modern methods in the field of production and quality management. · The student strives for continuous professional self-development and for keeping their knowledge up to date. · The student is open to interdisciplinary cooperation and recognizes the role of other fields in the efficient operation of business processes. · The student is committed to quality- and value-oriented thinking in the operation of business organizations. · The student strives for lifelong learning both within and beyond the world of work. · In order to achieve high-quality work performance, the student demonstrates a problem-sensitive and proactive attitude; in project work and group tasks, they act constructively, cooperatively, and with initiative. · The student is receptive to and accepting of human diversity, different viewpoints, and new ideas, and is willing to cooperate and share knowledge. · The student is familiar with the operational processes of task-oriented workgroups, as well as the management principles related to their coordination and leadership.
	Autonomy and responsibility · The student takes responsibility for their own professional development and consciously builds their business and management competencies. · The student cooperates with others, actively seeks problem-solving opportunities, and participates in joint decision-preparation processes. · The student feels responsible for the development of their work environment and organizational processes, with particular regard to quality-oriented operations. · The student complies with professional, legal, and ethical standards in their work and behavior. · The student assumes responsibility for adhering to professional, legal, and ethical norms and regulations related to their work and conduct. · The student recognizes and identifies with their ethical responsibility in motivating and influencing others. · When necessary, the student is willing to engage in conflict but strives responsibly for mutually acceptable solutions.
Brief description of the subject content	Definition of production, production management, interpretation in system approach. Production processes and process structures. Product structure. Production structure. Construction, manufacturing, industrial specialties. Technical, economic, human and IT factors of production. Price, cost and profit functions of production. Basic documentation of the production management. Quality, value, value hierarchy. Top management activities related to the quality. Components of the quality policy. Practical factors of the enterprise quality related activities. Quality management of services and business processes. Definition and parts of TQM and TVM.
Activity forms of students	Frontal work: 40 % Individual or group work: 40% Test: 20%
Compulsory reading and its availability	• Faramarzi, H., Drane, M., - Murtescu, K. (Eds.). (2022). Introduction to Operations Management. Seneca Polytechnic Press. [https://digitalrepository.senecapolytechnic.ca/s/oers/item/27321]

Recommended reading and its availability	• Malik, Y. F., Ernawati, D. P., - Rizkiyanti, A. A. (2024). A literature review on operations management and strategy. International Journal of Social Science and Business, 8(2), 311–316. [https://ejournal.undiksha.ac.id/index.php/IJSSB/article/download/76906/30705]
Hand-in Assignments/ measurement reports	Students have to write an industrial case study in 20-25 pages
Description of midterm tests	Mid-term written exams (2 times): theoretical questions, practical tasks.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Strategic Planning

Subject name	In Hungarian	Stratégiai Tervezés					Szintje	A	
	In English	Strategic Planning					Level	A	
Subject code		DUEN(L)-TVV-250							
Responsible educational unit		Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study		DUEN-TVV-114 Management							
Number of Lessons per semester							Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab			
Full-time		1		2		0	E (Exam)	5	English
Correspondence		5		10		0			
Teacher responsible for the course		Name		Dr. habil Mónika Rajcsányi-Molnár			Position	College Teacher	

Educational goals	The goal of the course is to develop the essential skills required of employees at the workplace and to expand students' planning skills. The course is designed to familiarize students with the planning processes taking place in work organizations on key information. Provided by the knowledge of the course enables the students to the need for long-term planning and the importance of understanding claim. In practical terms, students will be able to interpret theoretical knowledge of the relevant relationships to recognize.	
Typical delivery methods	Theoretical	In a classroom with the use of projector and computer in each lecture.
	Practice	In a classroom with the use of projector and computer in each seminar.
	Lab	-
Requirements	**Knowledge** Students as potential manager know and understand: • the difference between the traditional and the strategic management approach • the main steps of the strategic management process and apply management methodologies • the implementation of the required change management strategy, particularly sociological and psychological aspects of the organization	
	Ability Students will be able to: • use the concepts of area of specialty • choose the most suitable method in terms of business logic • apply the methods of approaches based on the theoretical approach • draw correct conclusions from the analyzes • Structured, systemic problems identified, to identify cause and effect relationships.	
	Attitude • Good negotiators are patient, well-educated and have empathy, i.e. they can identify with the representatives of the other side and accept their opinion. • Open to accommodate new innovative approaches. • Avoids the stereotypes. • Not think schemas. • Susceptible development opportunities for exploitation..	
	Autonomy and responsibility • In professional questions negotiators can play the role of a decision-maker and are able to solve problems alone. They can tackle problems as responsible persons, i.e. can decide if it is a need in a certain negotiation phase or situation to cooperate with others.	

Brief description of the subject content	The course familiarizes students with definition the strategic position of the organization (envir onment-, resources-- and analysis of the stakeholder). The strategic decision. Corporate and business level strategies. The strategic portfolio analysis. Implementation of the strategy, organizational development an d change management.
Activity forms of students	30% Student-workbook 30% mid-term test 30% final test 10% Individual presentation
Compulsory reading and its availability	• Robert M. Grant & Judith Jordan (2012) Foundations of Strategy, John Wiley & Sons, Inc. DUE Library • Materials on MOODLE
Recommended reading and its availability	• Art of War, Sun-Tzu (e-book) • Blue Ocean Strategy, Kim Chan & Renee Mauborgne, Harvard Business Review Press; 1st edition 2005. • Business Model Generation, Alexander Osterwalder & Yves Pigneur 2010. • Hand-outs from the lecturer, case studies, additional materials (Moodle)
Hand-in Assignments/ measurement reports	The task is / Student-workbook / 1. To identify and analyse the most important strategic factors for the growth of an existing business organization. 2. Provide a strategic analysis, and describe the proposed strategy for the organization.
Description of midterm tests	All students have to take midterm test and final test. /Multiple Choice Questions/
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams (ZH).

Project Management

Subject name	In Hungarian	Projektmenedzsment					Szintje	A	
	In English	Project Menedzsment					Level	A	
Subject code		DUENL)- TVV-116							
Responsible educational unit		Institute for Social Sciences Department of Economics and Management							
Name of Mandatory Preliminary Study									
Number of Lessons							Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab			
Full-time		1		2		0	M (Midterm mark)	5	English
Correspondence		5		10		0			
Teacher responsible for the course		Name		Dr. Mohamad Saleh			Position		
Educational goals		The aim of the course is to familiarize students with the basic concepts, systems, and methods of project management, as well as the relationships between projects and corporate strategy. Students will gain an overview of the project life cycle, the application of project planning, work breakdown structure (WBS), and network planning methods (CPM, PERT, Gantt), as well as the fundamentals of time and resource planning. The course also aims to enable students to acquire knowledge of the structure of project organizations, project management levels, responsibilities and authorities, the principles of human resource management and motivation, as well as resource and cost planning. The course equips students with the ability to regulate project implementation, monitoring, and closure, to process project results, and to ensure project quality through case studies and practical examples.							
Typical delivery methods		Theoretical	In a classroom with the use of a projector or a computer in each lecture.						
		Practice	In a classroom with the use of a projector or a computer in each seminar.						
		Lab							
Requirements (expressed in learning outcomes/competencies to be acquired)		Kno**wledge** · Knows and understands the fundamental concepts, theoretical frameworks, approaches, and fields of application of project management, with particular regard to the operation of business organizations; · Knows and understands the rules of cooperation within projects, teams, and work organizations, the basic principles of project leadership, as well as the related ethical norms; · Knows and understands the professional vocabulary, methods, and tools of project management that can be applied in economic decision preparation and decision support; · Knows and understands the phases of the project life cycle (initiation, planning, execution, control, closure), as well as their relationship with organizational and strategic processes; · Knows and understands the fundamental knowledge of leadership, organization, and management; · Understands the importance of a systems-oriented approach and strategic thinking in the analysis and development of business processes; · Knows the operational processes of task-oriented working groups and the management principles related to their coordination.							
		Skills							

	· The student is able to apply their theoretical and practical knowledge in an integrated manner within the project-oriented processes of business organizations; · The student is able to cooperate in groups and project teams and actively participate in cooperative problem-solving; · The student is able to perform project tasks independently, execute them responsibly, and contribute to the achievement of common objectives; · The student is able to apply in practice the methods, techniques, and tools used in project management (time, cost, and resource management); · The student is able to analyze professional issues from a multilateral, interdisciplinary perspective, with particular regard to economic, organizational, and human factors; · The student is able to understand, process, and apply professional literature related to project management and business fields; · The student is able to process and interpret professional literature related to the field and apply concepts in a professional manner.
	Attitude · The student demonstrates a problem-sensitive and proactive attitude in order to achieve efficient work performance; · The student is open to novel approaches and innovative solutions and does not think exclusively in rigid schemes; · The student takes a constructive, cooperative, and initiative role in project work and group tasks; · The student strives for continuous development and self-improvement, expanding their own professional knowledge; · The student participates in professional cooperation as an equal partner, respecting organizational and ethical norms; · The student is open to new results, innovations, and modern methods in the field of project management; · The student strives for continuous professional self-development and for keeping their knowledge up to date; · The student is open to interdisciplinary cooperation and recognizes the role of other fields in the efficient operation of business processes; · The student is receptive and accepting of human diversity, different viewpoints, and new ideas, and is willing to cooperate and share knowledge.
	Autonomy and responsibility · The student takes responsibility for their own professional development and consciously builds their business and management competencies; · The student cooperates with others, actively seeks problem-solving opportunities, and participates in joint decision-preparation processes; · The student feels responsible for the development of their work environment and organizational processes, with particular regard to quality-oriented operation; · The student complies with professional, legal, and ethical norms in their work and conduct; · The student takes responsibility for adhering to the professional, legal, and ethical standards and regulations related to their work and behavior; · The student recognizes and identifies with their ethical responsibility in relation to motivating and influencing others; · When necessary, the student is willing to undertake conflict but strives responsibly toward mutually acceptable solutions.
Brief description of the subject content	The course provides a comprehensive introduction to the basic concepts, objectives, life cycle, and operational mechanisms of projects and project management. Students become familiar with different types of projects, as well as the methods of project planning, the development of the work breakdown structure (WBS), time and resource planning, and risk management. During the course, students also gain knowledge of project

	organizational structures, the basic principles of human resource management, and the practical tools of project monitoring and documentation. The subject places emphasis on the analysis of real and simulated projects, the processing of case studies, the completion of group and individual tasks, the identification of problems, and the development of solution proposals. The course also aims to develop strategic thinking, problem-solving skills, teamwork, and ethical, responsible professional behavior, preparing students for the independent, quality- and performance-oriented management of projects in the context of organizational strategic objectives.
Activity forms of students	Max 10% for one individual presentation during the semester Max 20% for group work Max 30% for midterm test Max 40% for final test
Compulsory reading and its availability	• Mantel, S. J., Meredith, J. R., Shafer, S. M., & Sutton, M. M. (2024). Project management in practice (8th ed.). Wiley • Samuel J. Mantel (2008) Project Management in Practice,, International Student Version, 4th Edition, John Wiley & Sons, Inc. 2011. 4th Edition, DUE Library • Materials on MOODLE
Recommended reading and its availability	• Project Management Institute. (2021). A guide to the project management body of knowledge (PMBOK® Guide) – Seventh Edition and the Standard for Project Management (7th ed.). Project Management Institute. https://www.pmi.org/pmbok-guide-standards/foundational/pmbok, ISBN-13 (print): 978-1-62825-664-2 • Kerzner, Harold (2013) Project management: a system approach to planning, scheduling and controlling, 11th ed Hoboken: John Wiley & Sons, DUE Library • A Guide to the Project Management Body of Knowledge (PMBOK® Guide) Project Management Institute 2013. 5th Edition (e-book)
Hand-in Assignments/ measurement reports	Group work presentation, individual presentation
Description of midterm tests	Multi choice questions
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Engineering construction

Subject name		In Hungarian	**Gépszerkesztés**						Level	BSc	
		In English	**Engineering construction**						Code	**DUEN(L)-MGT-112**	
2023/2024 I.											
Responsible educational unit			**Institute of Engineering**								
Compulsory prerequisite subject:			**DUEx-MGT-111 Engineering description**								
Type		Number of lessons						Requirement	Credit	Language of education	
		Lecture		Seminar		Lab					
Full time	**150/60**	Per week	**1**	Per week	**2**	Per week	**0**	**V**	**5**	**English**	
Part time	**150/15**	Per semester	**5**	Per semester	**10**	Per semester	**0**				
Person responsible for the subject:				name		Dr. Péter Ákos Szilassy			position	university assistant professor	

Course objectives and justification (content, learning outcomes, place in curriculum)	**Short-term objective** Developing mechanical design skills. **Objectives and development goals** The student should be able to solve the graphical geometric problems that arise during the work of a mechanical engineer based on what has been learned in the subjects of Technical Representation and Fundamentals of Machine Design. Recognize the elementary constructions necessary for solving various complex tasks and be able to determine their appropriate sequence. Be able to select the optimal one for the given situation from among the possible solution methods. Be able to independently apply basic constructions to the division and transformation of simple three-dimensional geometric surfaces encountered in mechanical engineering practice by plane section, penetration and projective transformation. Be able to form complex shapes encountered in mechanical engineering practice, to form and edit surfaces using line movement, and to spread extensible surfaces onto a plane. The student should be proficient in the independent use of standards and drafting aids, in sketching and editing component drawings, and in editing machine units. The student should know the theoretical structure of the ISO tolerance and fit system to correctly specify permissible dimensional deviations, tolerances, and fits. Be able to specify the accuracy specifications for machine parts. Be able to know the metrics characterizing the surface quality of machine parts, be able to define them, and be able to specify them. Be able to design machine parts with a characteristic design corresponding to a given production technology. Be able to reconstruct the technical drawings of real machine parts so that the given part, or a part capable of replacing it, can be manufactured based on the completed drawing.
Typical delivery methods	Lecture: Transfer of theoretical knowledge through presentation Seminar: Problem solving with teacher guidance Lab: - Other: -
Requirements (in learning outcomes)	Knowledge • Knows the conceptual system, the most important relationships and theories related to his/her field of expertise. • Has a comprehensive knowledge of the knowledge acquisition and problem-solving methods of the main theories of his/her field of expertise. • Has a basic knowledge of machine design principles and methods, machine manufacturing technology, control engineering procedures and operating processes. • Has a comprehensive knowledge of the operating principles and structural units of applied work and power machines, mechanical equipment and devices.

	• Can interpret, characterize and model the structure and operation of the structural units and elements of mechanical systems, the design and relationship of the applied system elements. • Can apply the related calculation and modelling principles and methods of mechanical product, process and technological design.
	Ability • Performs a job that is appropriate to his/her professional qualifications. • Able to plan, organize and carry out independent learning. • Able to identify routine professional problems, explore, formulate and solve (through the practical application of standard operations) the theoretical and practical background necessary for their solution.
	Attitude • Open to learning and absorbing knowledge related to mechanical engineering related to his/her qualification and field of expertise. Interested in new methods and tools related to the field.
	Autonomy and responsibility • Taking responsibility for one's own work and the work of others.
Short description of subject content	Typical surfaces and bodies of mechanical engineering practice. Plane section of flat bodies. Plane section of curved bodies. Interaction of flat bodies. Interaction of curved bodies. The ISO tolerance system. Tolerances of longitudinal dimensions. Fittings. Surface quality metrics and their specification. Typical design of cast, welded and machined parts. Reconstruction of machine parts (reverse engineering).
Types of student activity	Processing theoretical material with guidance 20% Independent processing of theoretical material 20% Solving tasks with guidance 20% Independent processing of tasks 40% Laboratory measurements with guidance – Preparation of laboratory reports -
Required reading and resources	prof. Ferenc Szlivka: Machine structures III. - Workbook
Recommended reading and resources	
Assignments	Plane section of flat beam surfaces Plane section of bodies of revolution Interaction of flat beam surfaces Bolt and nut joint Parallel key joint Bearing installation
Description and schedule of exams	Week 7: Interaction of bodies of revolution Week 13: Tolerance calculation tasks
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is permitted in all situations during the learning process of the subject. It is the student's responsibility to verify the correctness of the results obtained.

Ergonomics and health promotion

<table>
<tr><td colspan="3" rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="3">Ergonómia és egészségfejlesztés</td><td>Szintje</td><td>A</td></tr>
<tr><td>In English</td><td colspan="3">Ergonomics and health promotion</td><td>Level</td><td>A</td></tr>
<tr><td colspan="4">Subject code</td><td colspan="5">DUEN(L)-TGT-214</td></tr>
<tr><td colspan="4">Responsible educational unit</td><td colspan="5">Institute for Social Sciences
Department of Management and Enterprise Sciences</td></tr>
<tr><td colspan="4">Name of Mandatory Preliminary Study</td><td colspan="5">-</td></tr>
<tr><td colspan="4" rowspan="2">Number of Lessons</td><td colspan="3" rowspan="2">Requirements</td><td>Credits (ECTS)</td><td>Language of Education</td></tr>
<tr><td colspan="2">Theoretical</td><td colspan="2">Practice</td><td>Lab</td></tr>
<tr><td>Full-time</td><td>150/39</td><td>1</td><td colspan="2">2</td><td>0</td><td colspan="3" rowspan="2">M</td><td rowspan="2">5</td><td rowspan="2">English</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td>5</td><td colspan="2">10</td><td>0</td></tr>
<tr><td colspan="4">Teacher responsible for the course</td><td>Name</td><td colspan="3">Dr. habil Mónika Rajcsányi-Molnár</td><td>Position</td><td>College Teacher</td></tr>
<tr><td colspan="4">Educational goals</td><td colspan="5">To enable the students to improve the man-machine-environment system, ergonomic aspects of the interpretation, the effective design and operation of safe and convenient to use human. The student will be familiar with: The ergonomic, security and health-saving regulations in workplaces, and the main knowledge of health promotion.</td></tr>
<tr><td colspan="4" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="4">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="4">Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work</td></tr>
<tr><td>Lab</td><td colspan="4">-</td></tr>
<tr><td colspan="4" rowspan="3">Requirements</td><td colspan="5">Knowledge

• Knows the conceptual system of ergonomics and its practical applicability.
• Knows the characteristics of stress and strain and their interaction with individual performance.
• Knows the characteristics of perception and observation.
• Knows the ergonomic aspects of tool design.
• Knows the characteristics of the human-machine-environment system and the conditions of design.
• Knows the regulations and requirements of safety and health protection.
• Knows the concept of health promotion, the possibilities for individual skill development, and the requirements for creating a healthy environment.</td></tr>
<tr><td colspan="5">Ability

• Open-minded and able to accept opinions that differ from their own.
• Committed to ensuring their own safety and health and that of their colleagues. To this end, they strive to ensure that the objects they use, their work tools, and their home and workplace conditions are ergonomically appropriate.
• Complies with work and safety regulations and ergonomic requirements related to their work.</td></tr>
<tr><td colspan="5">Attitude

• They are open and willing to discuss all points of the cases, as well as express their opinion.
• For them it is important to maintain their and others' safety and health.
• To achieve these goals they endeavour to have ergonomic facilities and environments both at home and in workplaces.</td></tr>
</table>

	• Obey the relevant safety,- health regulations and ergonomic requirements.
	Autonomy and responsibility • Feels responsible for the safety and health of their colleagues. • Their sense of responsibility extends to the ergonomic design of work processes and workplaces. • They are able to independently assess their workplace and its environment from an ergonomic point of view and then improve the situation with their suggestions.
Brief description of the subject content	The interpretation of ergonomics, its conceptual system, history of development, and social usefulness. The areas of application of ergonomics and their characteristics. The relationship between stress and strain. The relationship between work content, exertion, and performance. The characteristics of humans as consumers and users, their mindset, perception, cognition, and anthropometry. The development of human-machine interaction systems (tool design, control and adjustment elements, signaling elements, design and selection). Characteristics of the human-machine-environment system, design conditions. The physical work environment from an ergonomic perspective. Safety and health issues in organizations. The concept and purpose of health promotion, requirements for creating a health-promoting environment, learning about the legal and economic background conditions.
Activity forms of students	Case study analysis, Presentations, Individual work, Frontal class work, Essay writing
Compulsory reading and its availability	• McCauley-Bush, Pamela (2012) Ergonomics: foundational principles, applications and technologies. Boca Raton: CRC Press, ISBN 9781439804452, DUE Library • Materials on MOODLE
Recommended reading and its availability	• Kroemer K, H. K. E. (2001): Ergonomics: How to design for ease and efficiency, Upper Saddle River, NJ, Prentice Hall, DUE Library
Hand-in Assignments/ measurement reports	Preparation of a paper based on personal experience related to the course material (30 points) Completion of class assignments twice (total of 2x5 points)
Description of midterm tests	During the semester, a minimum of 61% is required on one midterm exam. Number of points available on the midterm exam: 60 points Supplementary complex short essay (weeks 13-14)
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Thesis – Research Methodology TVV

Subject name	In Hungarian	Szakdolgozat – Kutatásmódszertan TVV						Szintje	A
	In English	**Thesis – Research methodology**						Level	A
Subject code		DUEN(L)- TVV- 090							
Responsible educational unit		Institute for Social Sciences Department of Economics and Management							
Name of Mandatory Preliminary Study									
Number of Lessons								Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab				
Full-time		1			0		0	Signature	-	English
Correspondence		5			0		0			
Teacher responsible for the course		Name		Dr. Anita Varga				Position	Collgege Professor	
Educational goals		The aim of the course is to enable technical management students to acquire the essential research skills required for thesis writing, which is a compulsory component for graduation. The course allows students to develop comprehensive and practical solutions to real-world problems, as well as to present the research findings of their thesis clearly and convincingly, both in writing and orally. Students will become familiar with various research methods, including the design and implementation of surveys and qualitative interviews. During the course, students will also learn how to record and organize their research results in descriptive or numerical form.							
Typical delivery methods		Theoretical	In a classroom suitable for lectures using a projector, or via the Microsoft Teams platform						
		Practice							
		Lab							
Requirements (expressed in learning outcomes/competencies to be acquired)		Knowledge Prospective graduates are familiar with and able to apply the essential research skills, including: · designing and preparing surveys and questionnaires · analyzing, critically evaluating, and organizing secondary literature · understanding the key terminology and concepts necessary for successful thesis writing · comprehending scientific systems, processes, and interconnections · recording and analyzing research results in descriptive and numerical form · This training ensures that students are capable of conducting independent research, identifying relevant problems, and proposing scientifically grounded, practical solutions in their theses.							
		Skills Upon completion of the course, students will be able to: · analyze and critically evaluate the knowledge systems that characterize research in their field · locate, understand, and effectively use library resources and the scientific literature relevant to their discipline · synthesize information from multiple sources to form well-founded, independent judgments · apply acquired knowledge in a structured and methodical way to practical and research problems · present research findings clearly and convincingly, both in writing and orally, in accordance							
		Attitude							

	• Successful researchers maintain an open-minded and impartial attitude toward the latest scientific findings while being attentive listeners and analytical thinkers. • They can form informed opinions on current trends and critically evaluate earlier research in the field of economics. • They are aware of the ethical and methodological standards of scientific work, capable of drawing objective conclusions, and able to integrate new knowledge into their existing understanding in a structured and independent manner. • They strive for continuous development of professional competencies and for presenting research results clearly and convincingly, both in writing and orally
	Autonomy and responsibility • Students demonstrate the ability to independently analyze complex professional issues, critically reflect upon and rigorously evaluate scientific findings, and integrate these insights into their own research. • Within professional contexts, they exhibit collaborative engagement, accountability, and respectful interaction with members of the academic and professional community. • They are capable of systematically identifying and resolving problems that arise throughout the research process, evaluating alternative approaches, and formulating decisions based on sound scientific reasoning. • Furthermore, they are committed to the continuous enhancement of their professional competencies and to the clear, structured, and academically rigorous presentation of research outcomes, both in written and oral formats.
Brief description of the subject content	The course familiarizes students with news trends of research methodology. The course presents the available thesis writing regulations, norms and criteria in complience with University requirements. The course contains a thorough description and explanation of sampling, research question types, open ended questions and research scales. The planning and structuring of qualitative interview research. Data analysis, research evaluation.
Activity forms of students	Research data analysis Frontal work Individual or group work Weekly consultations
Compulsory reading and its availability	• Babbie, E. R. (2021). The practice of social research (15th ed.). Cengage Learning. ISBN-13: 9780357360767 • Pearce, J. M. (2018). How to perform a literature review with free and open source software. Practical Assessment, Research & Evaluation, 23(1), Article 8. https://doi.org/10.7275/jjhz-sz75
Recommended reading and its availability	• Thomas, C. G. (2021). Research methodology and scientific writing. Springer. ISBN 9783030648657. • Zhang, Y. (2025). Research on application and innovation in civil engineering construction management. Open Access Library Journal, 12, 1–10. https://doi.org/10.4236/oalib.1112843 • Frichi, Y., Jawab, F., - Boutahari, S. (2019). An exploratory qualitative study of the influence of hospital logistics factors on quality of care and patient satisfaction at public hospitals in Morocco. Advances in Science, Technology and Engineering Systems Journal, 4(6), 414–422. https://doi.org/10.25046/aj040652
Hand-in Assignments/ measurement reports	Weekly personal consultation with the supervisor Discussion about each prepared chapter Submission of thesis until the deadline required in the University's exam schedule Preparation of the research questionnaire. Defining the hypothesis.
Description of midterm tests	During week 13 a presentation about a chosen topic.
Framework and rules for the use of artificial intelligence	Partial Permission: Artificial intelligence is permitted only with proper citation (APA) for the following purposes: Data collection, e.g., about the selected organization (e.g., ChatGPT, Gemini)

	Literature gathering (e.g., Scopus AI, Perplexity, Consensus) Translation of texts in foreign languages (e.g., DeepL) Grammar and stylistic text formatting (e.g., Grammarly, Paperpal) In all other cases, AI use is prohibited.

Principles of Accounting

Subject name		In Hungarian		Számvitel alapjai					Level		A
		In English		Principles of Accounting							DUEN(L)-TKT-217
Subject code											
Responsible educational unit				Institute for Social Sciences Department of Economics and Management							
Name of Mandatory Preliminary Study											
Number of Lessons								Requirements	Credits (ECTS)	Language of Education	
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M (Midterm mark)	5	English	
Correspondence	150/15		5		10		0				
Teacher responsible for the course				Name		Dr.Erzsébet Szász			Position	College Professor	
Educational goals				By the end of the course, students will get acquainted with the purpose, philosophy, structure, requirements and principles of the (Hungarian) Law of Accounting. They will have an overall view of the interrelations of tax systems and accounting in economic practice. They will be familiar with the materials and tools necessary for the application of accounting software programs. They will be able to understand business processes and analyze them under professional guidance.					
Typical delivery methods				Theoretical		In a classroom with the use of a projector or a computer in each lecture.					
				Practice		In a classroom with the use of a projector or a computer in each seminar.					
				Lab							
Requirements (expressed in learning outcomes/competencies to be acquired)				**Knowledge** Students know • the most important context and theories of accounting and they make up the terminology. • the basic knowledge acquisition and problem-solving methods of accounting							
				Ability • Students will get acquainted with the purpose, philosophy, structure, requirements and principles of the (Hungarian) Law of Accounting; and they will have an overall view of the interrelations of tax systems and accounting in economic practice. They will be able to: • apply accounting software programs. • understand business processes • analyze them under professional guidance • understand economic phenomena • analyze their effects on the balance and results of a business					
				Attitude • Open-mindedness, comprehensive thinking, and the ability to authentically convey and communicate the fundamental characteristics of practical operations. • A desire for continuous self-improvement in the field of economics.							
				Autonomy and responsibility • Independently considers comprehensive, fundamental professional issues and thinks them through based on the given resources. • Characterized by cooperation and responsibility with qualified professionals in the given field. • Takes responsibility for the views that form the basis of the profession.							

Brief description of the subject content	Purpose and scope of accounting law, areas and types of accounting, methods of regulation. Accounting principles. Components of financial accounting: financial statements, bookkeeping and documentation, auditing and disclosure, publication. Types of financial statements: annual financial statements, simplified annual financial statements, consolidated annual financial statements, simplified financial statements. Specific features and content of accounting policy. Conditions, components and definitions for the preparation of each financial statement. Classification of business assets, inventory. The balance sheet. The concept, classification, and presentation of profit. Content and compilation of the income statement. Economic operations and their impact on assets. Bookkeeping for businesses. Use of a uniform chart of accounts, account classes. The tools of double-entry bookkeeping: the account. Compilation of the report. The relationship between tax systems and accounting in practice.
Activity forms of students	Processing theoretical material under supervision: 30% Independent processing of theoretical material: 10% Task completion under supervision: 40% Independent task completion: 20%
Compulsory reading and its availability	• Weygandt, Jerry J. et al: Accounting Principles, Wiley.com, Moodle-ban meghatározott részei, elérhetőség: bit.ly/4ayXvPB • Materials on MOODLE from accountingcoach.com http://www.accountingcoach.com/
Recommended reading and its availability	• Accounting Principles: Finance Skills [free-management-ebook]. • Full text at http://www.free-management-ebooks.com/dldebk/dlfi-principles.htm • AGTARAP-SAN JUAN, Donatila (2007): Fundamentals of Accounting: Basic Accounting Principles Simplified for Accounting Students. Bloomington: Author House, 408 p. • ISBN 978 1 434 32299 9 • CELENDER, Michael A. (2013): Accounting Basics: Complete Guide. Create Space Independent Publishing Platform, 378 p. • ISBN 978 1 482 32481 5
Hand-in Assignments/measurement reports	Homeworkss related to theoretical and practical material Oral exam on accounting concepts
Description of midterm tests	Three written tests during the semester. • 1st test: 30 points (practice) • 2nd test: 35 points (practice) • 3rd test 35 points (from lecture materials) The total number of points available in the three midterm exams is 100 points.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Environmental Protection and Energy Management

Subject name		Hungarian		Környezetvédelem és energiagazdálkodás					Level		A
		English		Environmental Protection and Energy Management					Code		DUEN(L)-MUT-110
Responsible educational unit				Institute of Engineering							
Name of prerequisite subject											
Type		Class hours / week						Requirements	ECTS		Language of instruction
		Theoretical		Practice		Lab					
Full time course	150/39		2		0		1	M	5		English
Long distance course	150/15	per Semester	10	per Semester	0	per Semester	5				
Teacher responsible for subject				Name		Dr.Endre Kiss			Position		College Teacher
Educational goal (competencies to be acquired)				Students will get acquainted with the basic principles and general issues of environmental protection, the technologies of abatement and the elimination of pollutants.							
Typical transfer ways				Theoretical		In a classroom with the use of projector or computer in each lecture.					
				Practice		In a classroom with the use of projector or computer in each seminar with max. 20 students					
				Lab		Presentations and exercises in a workshop					
				Other							
Requirements (expressed in educational results)				**Knowledge** Students will know the basic terms of cutting processes know the type and features of cutting able to do calculation of machining time and cost analysis able to do calculation of dimensional chain							
				Ability They are able to use the obtained skills even few years later, in real situations							
				Attitude Open-minded for the mechanical innovation on their field.							
				Autonomy and Responsibility Responsible for their results.							
Brief description of the subject content				Basics of ecology. The purpose and fundamental issues of environment protection. The biological and geological environment. Cycles. The athmosphere. The most important pollutants of air. The properties of dust pollution in the air. The general properties of dust collection. Settling chambers and collectors with flow direction transformation. Cyclones. Basics of bag filters. Operating and cleaning of bag filters. Introduction of electrostatic precipitators. Bag filters with electrostatic charging and their possibilities of applications. Electrostatic precipitation with pulse energisation, abatement and decomposition of gases. Absorption and absorption processes. Scrabbers. Oxidation methods. Burning technologies. Odor abatement. The measurement of air pollution. The properties of natural waters and their pollution, self cleaning. Water treatment technologies and their equipments. The pollution of soil. Waste and waste treatment. Noise and vibration as environmental pollution. Radioactive pollution. Basics of energy management. Renewable energies.							
Forms of student activity				Assimilation of the theoretical material with assistance: 5 % Assimilation of the theoretical material without assistance: 40 % Problem solving with assistance: 15 % Problem solving without assistance: 40 %							

Compulsory reading and its availability	1. Ecology and Environmental Protection, selected chapters (on O drive) 2. Environmental Science Toward a Sustainable Future Richard T. Write, Bernard J. Nebel, Prentice Hall
Recommended reading and its availability	3. The Biosphere, Ian Bradbury, Belhaven Press 4. Air Pollution, Its Origin and Control, Kenneth Wark and Cecil F. Warner, Harper and Row 5. Hazardous Waste Management Michael D. LaGrega, McGraw Hill 6. Drinking Water Quality, N.F. Gray, Wiley

Thesis writing- MMENBSC

Subject name	In Hungarian	Szakdolgozat					Szintje	A	
	In English	**Thesis writing- MMENBSC**					Level	A	
Subject code		DUEN(L)- TVV- 091							
Responsible educational unit		Institute for Social Sciences Department of Economics and Management							
Name of Mandatory Preliminary Study		TVV-090 Thesis writin 1. Thesis research TVV							
Number of Lessons							Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab			
Full-time		1			0	0	S (signature)	15	English
Correspondence		5			0	0			
Teacher responsible for the course		Name		Dr. Anita Varga			Position	Collgege Professor	
Educational goals		To enable the students to the practical approach to complex problems, relieve stress, and awareness of written and oral, persuasive presentation, presentation. By the end of the semester, students should be able to: - identify problems, the main problem is the selection - to discover the cause of the problem analysis, - Set the target to be achieved, and the award criteria - alternatives / solutions of preliminary proposals drawn up - to evaluate selected alternatives / recommendations of the "best", decision to initiate, and to demonstrate the expected effects of the proposals - the decision is made in the export plan - manage the changes. put this opinion into writing in accordance with the general rules of communication and the expectations of the university.							
Typical delivery methods		Theoretical	In a classroom suitable for lectures using a projector, or via the Microsoft Teams platform						
		Practice							
		Lab							
Requirements (expressed in learning outcomes/competencies to be acquired)		Knowledge Students as future managers know by the end of course: · how to describe a firm from managerial aspect · how to analyse complex situation and problem · the most important manager tools for analyses · how to present their results and ideas so as to convince their future bosses							
		Skills Students will be able: · to plan their work, · to take the necessary steps, · to evaluate their results, · to finish their tasks by deadline · to identify and solve the problems of organizations · to apply the learning materials in practice · to communicate effectively with their supervisors · to work individually · to report their work both verbally and orally with presentations as well							
		Attitude • The student is open to the active interpretation and application of situations presented during classes in a practical environment. • They respond sensitively to problems generated by real market challenges and are motivated to seek their solutions.							

	• The student is receptive to recognizing and utilizing opportunities for development and strives for the continuous improvement of their professional competences.
	Autonomy and responsibility • Students feel responsibility for both their development and environment. They cooperate with each other. • They have sensibility to find possible resolving opportunities for problems
Brief description of the subject content	The purpose of the thesis is to enable the candidate for the degree in Technical Management to demonstrate adequate familiarity with relevant national and international literature in the given topic, as well as their analytical and evaluative skills. The candidate must prove that, through independent work, they are capable of conducting observations, collecting, processing and evaluating data, and drawing correct conclusions from them. The thesis should certify that the candidate possesses the knowledge, general education, and intellectual capacity necessary for practicing the profession, and is able to apply the acquired professional knowledge in practice and use it in a creative manner. It is a fundamental requirement for all students to solve the chosen topic and task, relying on their studies, at a level expected from candidates of Technical Management. A basic objective is that the thesis should be based on independent work. The completion of the thesis is a prerequisite for admission to the final examination. A student whose thesis is not accepted may not be admitted to the final examination
Activity forms of students	Individual learning activities
Compulsory reading and its availability	• Babbie, E. R. (2021). The practice of social research (15th ed.). Cengage Learning. ISBN-13: 9780357360767 • Pearce, J. M. (2018). How to perform a literature review with free and open source software. Practical Assessment, Research & Evaluation, 23(1), Article 8. https://doi.org/10.7275/jjhz-sz75
Recommended reading and its availability	• Thomas, C. G. (2021). Research methodology and scientific writing. Springer. ISBN 9783030648657. • Zhang, Y. (2025). Research on application and innovation in civil engineering construction management. Open Access Library Journal, 12, 1–10. https://doi.org/10.4236/oalib.1112843
Hand-in Assignments/ measurement reports	
Description of midterm tests	
Framework and rules for the use of artificial intelligence	Partial Permission: Artificial intelligence is permitted only with proper citation (APA) for the following purposes: Data collection, e.g., about the selected organization (e.g., ChatGPT, Gemini) Literature gathering (e.g., Scopus AI, Perplexity, Consensus) Translation of texts in foreign languages (e.g., DeepL) Grammar and stylistic text formatting (e.g., Grammarly, Paperpal) In all other cases, AI use is prohibited.

Internship MMENBSC

Subject name	In Hungarian	Szakmai gyakorlat					Szintje	A	
	In English	**Internship**					Level	A	
Subject code		DUEN(L)- TVV- 093							
Responsible educational unit		Institute for Social Sciences Department of Economics and Management							
Name of Mandatory Preliminary Study		TVV-090 Thesis writin 1. Thesis research TVV							
Number of Lessons							Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab			
Full-time		0		0		0	S (signature)	0	English
Correspondence		0		0		0			
Teacher responsible for the course		Name		Dr. Anita Varga			Position	Collgege Professor	

Educational goals	The aim of the course is to introduce the general rules of research work, as well as the relevant regulations and formal–content requirements of DUE. The course prepares students to conduct independent, methodologically grounded research, with particular emphasis on analyzing problems related to technical and economic fields at their chosen practical placement or work environment. By the end of the course, with the guidance of a designated supervisor at the practical site and using their preparatory studies, students will be able to plan and carry out independent research and present their results in a professional written format, providing a foundation for preparing their thesis. In this context, the student will be able to: · identify and explore problems and select the problem to be addressed, · collect and organize knowledge relevant to solving the problem, · synthesize the gathered knowledge · form an independent opinion regarding the chosen problem, · communicate their opinion in writing, following general rules of communication and the expectations of the University.	
Typical delivery methods	Theoretical	
	Practice	Carrying out tasks at the professional practical placement in accordance with the requirements of the program.
	Lab	
Requirements (expressed in learning outcomes/competencies to be acquired)	Kno**wledge** The student possesses: · theoretical and practical knowledge related to the processes of economic organizations, · a foundation in project management, organizational operations, economic and human factors, as well as their interdisciplinary interrelationships, · the theoretical background necessary to understand professional literature in the field, · the theoretical basis of the functioning of applied methods, techniques, and tools. The student also: · knows and understands the rules of collaboration within projects, teams, and work organizations, the principles of leadership, and the related ethical standards, · understands the importance of a systems-oriented approach and strategic thinking in the analysis and development of economic processes, · is familiar with the operational processes of task-oriented workgroups and the management principles applicable to their coordination.	

	Skills By the end of the practical placement, the student will be able to: · Plan their work, take the necessary actions, evaluate results, complete tasks within deadlines, identify and solve problems in work organizations, and apply learned knowledge professionally. · Communicate effectively with professionals and perform tasks both individually and as part of a team. · Prepare a report on the practical placement or the thesis preparation process—presenting their work in writing and orally, supported by a presentation, identifying and addressing errors or deficiencies encountered during the work process. · Apply their theoretical and practical knowledge in an organized manner to the processes of economic organizations. · Collaborate effectively in groups or project teams and actively participate in cooperative problem-solving. · Carry out assigned tasks independently and responsibly, contributing to the achievement of shared goals. · Apply the methods, techniques, and tools in practice. · Analyze professional issues from a multi-faceted, interdisciplinary perspective, with particular attention to economic, organizational, and human factors. · Understand, process, and apply professional literature in the field. · Process and interpret field-specific literature and apply the relevant concepts accurately and professionally.
	Attitude · The student demonstrates a problem-sensitive and proactive approach to ensure effective work performance. · The student is open to novel approaches and innovative solutions and does not think exclusively in rigid patterns. · The student takes a constructive, cooperative, and initiative-driven role during project work and group tasks. · The student strives for continuous development and self-improvement, expanding their professional knowledge. · The student participates in professional collaborations as an equal partner, respecting organizational and ethical norms. · The student is open to new results, innovations, and modern methods in the field of project management. · The student aims to maintain up-to-date professional knowledge through continuous self-learning. · The student is open to interdisciplinary collaboration and recognizes the role of other fields in the efficient operation of business processes. · The student is receptive and accepting of human diversity, different viewpoints, and new ideas, and is willing to cooperate and share knowledge.
	Autonomy and responsibility By the end of the professional internship, the student will be able to: · Independently organize and manage their professional work, taking responsibility for the proper and timely completion of assigned tasks. · Take into account the requirements of quality management and logistics systems, as well as organizational and economic considerations, when making decisions. · Assume responsibility for the professional soundness of analyses, recommendations, and documentation they produce. · Be open to professional feedback, incorporate it into their work, and strive for continuous professional development. · Collaborate effectively with organizational staff while also making independent decisions within their scope of authority. · Demonstrate ethical and rule-abiding behavior, with particular attention to data handling, documentation, and adherence to organizational norms.

	· Recognize their own competence limits and initiate professional consultation when necessary. · Cooperate with others, actively seek problem-solving opportunities, and participate in joint decision-preparation processes. · Take responsibility for the development of their work environment and organizational processes, with particular attention to quality operations.
Brief description of the subject content	The student completes the internship in an environment that meets the professional requirements of their program and specialization. The host company must provide the material and personnel resources necessary for tasks corresponding to the student's specialization. The student's practical professional work is supported through the assignment of a supervisor and the provision of opportunities for consultation throughout the processes of data collection, literature research, problem-solving, analysis, evaluation, and decision-making.
Activity forms of students	· Guided information and literature processing: 40% · Case study–based and problem-centered learning: 20% · Project-based and group learning activities: 10% · Independent task completion and reflective learning: 30%
Compulsory reading and its availability	Searching for, reviewing, and synthesizing domestic and international professional literature related to the specializations and the thesis topic.
Recommended reading and its availability	
Hand-in Assignments/ measurement reports	
Description of midterm tests	
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is not permitted when preparing reports. It is not relevant for other tasks.

Human Resource Management

<table>
<tr><td rowspan="2">Subject name</td><td>In Hungarian</td><td colspan="4">Emberi erőforrás menedzsment</td><td>Level</td><td>A</td></tr>
<tr><td>In English</td><td colspan="4">Human Resource Management</td><td></td><td>DUEN(L)-TVV-111</td></tr>
<tr><td colspan="2">Subject code</td><td colspan="6"></td></tr>
<tr><td colspan="2">Responsible educational unit</td><td colspan="6">Institute for Social Sciences
Department of Economics and Management Sciences</td></tr>
<tr><td colspan="2">Name of Mandatory Preliminary Study</td><td colspan="6"></td></tr>
<tr><td colspan="3">Number of Lessons per semester</td><td colspan="3" rowspan="2">Requirements</td><td>Credits (ECTS)</td><td>Language of Education</td></tr>
<tr><td></td><td>Theoretical</td><td colspan="2">Practice</td><td colspan="2">Lab</td><td></td><td></td></tr>
<tr><td>Full-time</td><td>150/39</td><td></td><td>1</td><td></td><td>0</td><td></td><td>2</td><td rowspan="2">M (Midterm mark)</td><td>5</td><td>English</td></tr>
<tr><td>Correspondence</td><td>150/15</td><td></td><td>5</td><td></td><td>10</td><td></td><td>0</td><td>5</td><td></td></tr>
<tr><td colspan="2">Teacher responsible for the course</td><td>Name</td><td colspan="3">Dr. habil Mónika Rajcsányi-Molnár</td><td>Position</td><td>College professorr</td></tr>
<tr><td colspan="2">Educational goals</td><td colspan="6">The goal of the course is to develop the essential skills required of employees at the workplace and to expand students' HR management skills.
The course broadens the students' knowledge and gives abilities to manage the labor market institutions and policies, workplace and labor market characteristics, the system of labor relations, competence and motivation management, personnel management activities, organizational behavior, organizational communication, human resource management case studies, occupational safety and health project management.</td></tr>
<tr><td colspan="2" rowspan="3">Typical delivery methods</td><td>Theoretical</td><td colspan="5">In a classroom with the use of projector or computer in each lecture.</td></tr>
<tr><td>Practice</td><td colspan="5">In a classroom with the use of projector or computer in each seminar.</td></tr>
<tr><td>Lab</td><td colspan="5"></td></tr>
<tr><td colspan="2" rowspan="3">Requirements</td><td colspan="6">Knowledge
• The students know the basic facts, relationships, boundaries, limitations in human resource management (HRM) system of knowledge and activity.
• They know and understand the processes and procedures for the modalities of human activities.
• They familiar with the business of manufacturing and service processes, human and social relationships, their impact on human resources.
• knows that a key element in the prosperity of the people working successfully</td></tr>
<tr><td colspan="6">Ability
• The students can apply the analyzing methods and tasks (planning, organizing, and thinking in alternatives, inspection) on theoretical and practical grounds.
• They are able to achieve the tasks assigned to them without control and inspection.
• They can plan, schedule and complete the tasks within their scope of responsibility.
• They can make the suggestions and decisions and take measures required for successfully solving a task within their own scope of competence.
• They are capable of understanding the cause-result relationship and using analyzing skills in the activity chain of planning-organizing-decision preparing-decision-making
• They can c apply the roles connected to employment and use and utilize managerial competences.
• They are able to formulate an opinion of their own, deliver and defend it.</td></tr>
<tr><td colspan="6">Attitude
• Good negotiators are patient, well-educated and have empathy, i.e. they can identify with the representatives of the other side and accept their opinion.
• Good, future-oriented bargainers respect their counterpart, are trustworthy and not aggressive.</td></tr>
</table>

	• It takes into account the employment practices of legal, ethical and professional rules. • Susceptible to accommodate new information, new tasks that require collaboration. • Considers it important for individual career planning. • It strives to lifelong learning and help the staff as well.
	Autonomy and responsibility • In professional questions negotiators can play the role of a decision-maker and are able to solve problems alone. • They can tackle problems as responsible persons, i.e. can decide if it is a need in a certain negotiation phase or situation to cooperate with others. • Ability to select its own staff, taking into account the specified criteria. • Ability to independently supply the areas it controls human processes. • Sense of responsibility for subordinates working fellow.
Brief description of the subject content	Evolution of the human resource management. Environmentally determination of HRM. The HRM place in the organizational structure. The HRM's activities and tasks. Job planning, analysis, competency models. Career management, career planning alignment of individual and organizational career opportunities. The workforce training and development opportunities. Performance evaluation and feedback management. Compensation and incentive systems. Industrial relations system. Management of organizational changes. New trends in HRM practice.
Activity forms of students	Pair work presentation Group work (case study analysis)
Compulsory reading and its availability	• David Campbell & Tom Craig(2011):Organisation and the Business Environment, Second edition, Routledge Publishing, USA • Materials on Moodle • Handouts from the lecturer
Recommended reading and its availability	• TORRINGTON, Derek – HALL, Laura – TAYLOR, Stephen (2005): Human Resource Management. Pearson Education Limited, Essex, England.810 p. ISBN 978-0-273-68713-9 ARMSTRONG, Michael (2009): A handbook of Human Resource Management Practice, 11th ed. London: Kogan Page 1062 p. ISBN 0-7494-4631-5 http://www.academia.edu/1418840/ARMSTRONGS_HANDBOOK_OF_HUMAN_RESOURCE_MANAGEMENT_PRACTICE)
Hand-in Assignments/ measurement reports	Students have to take a final test
Description of final test	Multi-choice questions
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: - during class work, for data collection and information gathering for assignments - for data collection for certain HF assignments - during preparation for ZH The use of any AI tools is prohibited during knowledge assessment and closed book exams.

Basics of energy saving and conservation

Name of the subject		in Hungarian		Gazdaságos energiafelhasználás alapjai					Level	Spec	
		in English		Basics of energy saving and conservation					Code	DUEN(L)-MGT-153	
Responsible educational unit				Technical Institute, Department of Energy and Mechanical Engineering							
Name of compulsory prior learning											
Type		Presentation		Practice		Laboratory		Requirement	Credit	Language of education	
Full time	150/39	per week	2	per week	1	per week	0	E(Exam)	5	english	
Part time	150/15	per term	10	per term	5	per term	0				
Teacher responsible for the subject				Name		Dr. Éva Kovács-Bokor			schedule	associate professor	

Training objective and justification of the course (content, output, location in the curriculum)	**Short-term objective** To introduce students to the field of energy management and to familiarise them with the operation, use and development of the necessary high-efficiency and safe equipment.	
	Objectives and development goals This subject is part of Green Energy sub course based by the knowledge received by the student in Environmental Protection and Energy Usage. This discipline is one of the subjects of the Final Examination. In this course the problems delt are very much practical, closely related to the industry.	
Typical delivery methods	Presentation	For all students in a large lecture hall with a blackboard presentation. Use of projector.
	Practice	Supervised and independent solution of numerical examples and case studies in the form of small-scale exercises.
	Laboratory	
	Other	
Requirements (expressed in terms of learning outcomes)	**Knowledge** • Have a comprehensive knowledge of the basic facts, directions and limits of the subject area of engineering. • Knowledge of the general and specific rules, contexts and procedures necessary for the operation of the field of engineering. • Knowledge of the terminology, key concepts and theories related to the field. • Comprehensive knowledge of the main theories in the field of knowledge acquisition and problem solving • methods of problem solving. • Basic knowledge of machine design principles and methods, control procedures and operational processes. • Has an applied knowledge of measurement procedures, their tools, instruments and measuring equipment used in mechanical engineering. • Understand, characterise and model the structure and operation of the structural units and elements of mechanical systems, the design and interrelationship of the system components used.	
	Ability • The ability to analyse at a basic level the disciplines that make up the knowledge base of the technical field, to synthesise relationships and to make appropriate evaluations. • Ability to apply the most important terminologies, theories and procedures of the technical discipline in the performance of related tasks. • Ability to plan, organise and conduct independent learning. • Ability to identify routine technical problems and to apply the principles and techniques needed to solve them • to identify, formulate and implement (standard operations in practice) • (using standard procedures).	
	Attitude • It assumes and authentically represents the social role of its profession and its fundamental relationship with the world.	

	• Open to learning about, accepting and authentically communicating professional and technological developments and innovations in the field of engineering. • Seeks to solve problems, preferably in cooperation with others. • Have the stamina and tolerance of monotony to carry out practical activities • has the ability to • Applies his/her acquired technical knowledge to gain a thorough understanding of observable phenomena, to describe and explain their laws. • In his/her work, he/she observes and complies with the relevant safety, health, environmental, quality assurance and control requirements.
	Autonomy and responsibility • In unexpected decision situations, he/she independently thinks through and develops comprehensive, substantiating professional questions on the basis of given sources. • In the performance of his/her professional duties, he/she will also cooperate with qualified professionals from other disciplines (primarily technical, economic and legal). • He/she will share his/her experience with his/her colleagues in order to support their development. • Assumes responsibility for the consequences of his/her technical analyses, the resulting proposals and the decisions taken.
Short description of the subject content	Introduction to energy management. Areas of energy and energy management. Overview of the world energy economy, main trends and macro-relationships. Overview of national energy management in Hungary. National energy structure and energy balance. Main energy needs of each economic sector. Energy demand and energy use of the population. Energy carriers and sources I: Energy carriers and energy sources of our planet. Exhaustible, renewable and renewable resources. Physical and chemical properties of different energy carriers. Extraction, transport and storage of energy carriers. Fossil fuels. Coal, oil, natural gas. Energy carriers and resources II: Exhaustible energy sources: nuclear energy. Renewable energy sources: solar, wind, hydro and geothermal, biomass, biogas. Waste-to-energy options. Conversion processes of energy carriers: combustion, combustion products. Energy conversion l. Thermal energy: stove, convector, hot water boiler, steam boiler. Electricity: thermal power plants, gas engines, gas and steam turbines, steam cycles, condensing power plants, combined cycle power plants. Treatment, storage, disposal and use of pollutants. Remediation, maintenance. Energy transport. Storage facilities. Water, gas, hot water, steam and electricity networks. Energy use I. Meeting heat demand, heating and hot water supply. Energy use in industrial processes. Electricity and heat consumption. Energy requirements of agriculture, transport and services. Ways of meeting demand. Legal environment, strategic approach. Legal environment of energy supply, laws and regulations. Corporate energy management. Tasks of the energy manager. Strategic approach. Energy management. Systematic description of energy use. Understanding of system and system boundary. Mass and energy balances. Effectiveness and efficiency. Energy use lI . Nature of use, performance and duration diagram. Estimation of expected consumption. Optimal control, monitoring of consumption, equipment operating in parallel. Energy storage options, storage. Energy use in residential, government, industry and agriculture. The energy mix. Energy use lII Transport of energy carriers. Transport planning. Optimal means and routes of transport. Recovery of losses. Safety considerations. Environmental constraints, emissions of pollutants during energy use Energy use lV . Description of energy conversion and consumption processes. Balance equations: mass, energy and waste balance. Identification of losses.
Types of student activities	Presentation: Processing of lectures with notes 40%, independent processing of theoretical material 20%, preparation of a seminar presentation 40%

Required literature and contact details	• Endre Kiss: The Basics of Economical Energy Use, Electronic handbook, 2023, Moodle system
Recommended literature and contact details	• Y. Mizuta: Energy Saving Technology kézikönyv, JICA-DEED kiadásában, 2003
Description of tasks to be submitted/measurement reports	Full-time: student seminar presentations Part-time: student seminar presentations
Description and timetable of the workshops	During the semester, for correspondence students in the 2nd and 4th consultation, and for day students in the 6th and 13th week, five theoretical questions from the lectures. The papers are 100-100 marks, with a maximum of 20 marks for each question. The marks for the essay will be calculated according to the mark limits given in the Regulations.
Framework and rules for the use of artificial intelligence	The usage of artificial intelligence is suggested in preparing seminar presentations by the students, using the special ability of translating foreign language test, especially Chinese language materials in the field of economical use of energy.

ESG approach for businesses

Subject name	In Hungarian	ESG szemlélet a vállalkozásoknál	Szintje	A
	In English	ESG approach for businesses	Level	A

Subject code	DUEN(L)-TGT-110
Responsible educational unit	Institute for Social Sciences Department of Economics
Name of Mandatory Preliminary Study	-

Number of Lessons				Requirements	Credits (ECTS)	Language of Education
	Theoretical	Practice	Lab			
Full-time (per week)	2	1	0	M (Midterm mark)	5	English
Correspondence (per term)	10	5	0			

Teacher responsible for the course	Name	Dr. Sándor Czinkóczi	Position	Assistant professor

Educational goals	The aim of the course is that, after mastering the individual ESG strategic objectives, the student will be able to consciously apply this knowledge and implement the principles necessary for economic and environmental sustainability both at home and in the workplace. The student should be capable of integrating sustainability considerations into the corporate strategic planning process.	
Typical delivery methods	**Theoretical**	In a classroom with the use of projector or computer in each lecture.
	Practice	Group work in a classroom suitable for project work (20–30 participants), based on training documents uploaded to the Moodle system. Using interactive methods, with small-group and individual work.
	Lab	-

Requirements

Knowledge
- Has knowledge of the concept and strategy of ESG.
- Is able to interpret the elements belonging to the individual ESG categories.

Ability
- Is able to apply ESG principles independently.
- Is able to consciously influence and protect the environment.
- Is able to integrate and enforce sustainability considerations in the corporate strategic planning process.
- Is able to cooperate effectively in teams and project work.
- Is able to communicate effectively in writing and orally.
- Is able to identify, structure, and analyze facts and basic relationships.
- Is able to formulate independent conclusions and critical observations.
- Is able to apply problem-solving methods.

Attitude
- Is open to sustainability and the related economic knowledge.
- Is interested in new methods and tools related to the field.
- Lives consciously by applying the knowledge acquired.

Autonomy and responsibility
- Cooperates with qualified professionals from other fields when carrying out professional tasks.
- Takes responsibility for consumer decisions and encourages others to act consciously.

Brief description of the subject content	During the course, students become familiar with the fundamentals of sustainable development and ESG strategy. They learn about the content of the individual components of ESG strategy, the steps involved in developing a sustainability strategy, and the role of ESG strategy in business operations. Students gain insight into the methodology for analyzing a company's internal and external environment, as well as into value creation, value analysis, and business model design. They also become familiar with the characteristics of the circular economy and the basics of stakeholder management.
Activity forms of students	Processing of theoretical material with guidance Independent processing of theoretical material Task-solving with guidance Independent and group-based task completion Role-playing, situational exercises
Compulsory reading and its availability	• PowerPoint presentation materials on MOODLE • Anita Boros – Gyula Koi: Sustainability and Law, Akadémiai Kiadó, 2025. (ISBN 978 963 664 178 8) mersz.hu
Recommended reading and its availability	• Tibor Faragó: Our Common Environment and Globalization, Akadémiai Kiadó, 2024. (ISBN 9 978 963 664 076 7) mersz.hu • ESG Scores V2.6.3. -ESG book – 2022 https://www.esgbook.com/docs/marketing/userguides/USERGUIDE_ESGBook_SCO_ESG_262.pdf • wbcsd: ESG Disclosure Hangbook, 2019https://docs.wbcsd.org/2019/04/ESG_Disclosure_Handbook.pdf
Hand-in Assignments/ measurement reports	1. Preparation of a sustainability-focused strategic plan for a real organization selected by the group (maximum 3 students), based on the methodology learned during practical classes (minimum 5, maximum 10 pages). The strategic plan must be submitted in written form to the instructor of the practical course no later than the day of the assessment. (Week 10) 2. Delivery of a PowerPoint presentation based on the submitted strategic plan, with a maximum length of 10 slides, presented by the student delegated by the group. (Week 11)
Description of midterm tests	The purpose of midterm tests is to assess whether students are able to give a written account of the concepts, tools, and strategies learned during the semester, understand and apply the systemic interrelationships among these elements, and demonstrate this knowledge through complex problem-solving tasks. (Week 12) Replacement: Week 13
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: • during class work, for data collection and information gathering related to tasks • for data collection for certain HF assignments • during preparation for ZH The use of any AI tools is strictly prohibited during assessments and the writing of in-class tests (midterm exams).

Analysis of Business Cases

Subject name	In Hungarian	ESG szemlélet a vállalkozásoknál	Szintje	A
	In English	ESG approach for businesses	Level	A

Subject code	DUEN(L)-TGT-110
Responsible educational unit	Institute for Social Sciences Department of Economics
Name of Mandatory Preliminary Study	-

Number of Lessons				Requirements	Credits (ECTS)	Language of Education
	Theoretical	Practice	Lab			
Full-time (per week)	2	1	0	M (Midterm mark)	5	English
Correspondence (per term)	10	5	0			

Teacher responsible for the course	Name	Dr. Sándor Czinkóczi	Position	Assistant professor

Educational goals	The aim of the course is that, after mastering the individual ESG strategic objectives, the student will be able to consciously apply this knowledge and implement the principles necessary for economic and environmental sustainability both at home and in the workplace. The student should be capable of integrating sustainability considerations into the corporate strategic planning process.	
Typical delivery methods	**Theoretical**	In a classroom with the use of projector or computer in each lecture.
	Practice	Group work in a classroom suitable for project work (20–30 participants), based on training documents uploaded to the Moodle system. Using interactive methods, with small-group and individual work.
	Lab	-

Requirements

Knowledge
- Has knowledge of the concept and strategy of ESG.
- Is able to interpret the elements belonging to the individual ESG categories.

Ability
- Is able to apply ESG principles independently.
- Is able to consciously influence and protect the environment.
- Is able to integrate and enforce sustainability considerations in the corporate strategic planning process.
- Is able to cooperate effectively in teams and project work.
- Is able to communicate effectively in writing and orally.
- Is able to identify, structure, and analyze facts and basic relationships.
- Is able to formulate independent conclusions and critical observations.
- Is able to apply problem-solving methods.

Attitude
- Is open to sustainability and the related economic knowledge.
- Is interested in new methods and tools related to the field.
- Lives consciously by applying the knowledge acquired.

Autonomy and responsibility
- Cooperates with qualified professionals from other fields when carrying out professional tasks.
- Takes responsibility for consumer decisions and encourages others to act consciously.

Brief description of the subject content	During the course, students become familiar with the fundamentals of sustainable development and ESG strategy. They learn about the content of the individual components of ESG strategy, the steps involved in developing a sustainability strategy, and the role of ESG strategy in business operations. Students gain insight into the methodology for analyzing a company's internal and external environment, as well as into value creation, value analysis, and business model design. They also become familiar with the characteristics of the circular economy and the basics of stakeholder management.
Activity forms of students	Processing of theoretical material with guidance Independent processing of theoretical material Task-solving with guidance Independent and group-based task completion Role-playing, situational exercises
Compulsory reading and its availability	• PowerPoint presentation materials on MOODLE • Anita Boros – Gyula Koi: Sustainability and Law, Akadémiai Kiadó, 2025. (ISBN 978 963 664 178 8) mersz.hu
Recommended reading and its availability	• Tibor Faragó: Our Common Environment and Globalization, Akadémiai Kiadó, 2024. (ISBN 9 978 963 664 076 7) mersz.hu • ESG Scores V2.6.3. -ESG book – 2022 https://www.esgbook.com/docs/marketing/userguides/USERGUIDE_ESGBook_SCO_ESG_262.pdf • wbcsd: ESG Disclosure Hangbook, 2019https://docs.wbcsd.org/2019/04/ESG_Disclosure_Handbook.pdf
Hand-in Assignments/ measurement reports	1. Preparation of a sustainability-focused strategic plan for a real organization selected by the group (maximum 3 students), based on the methodology learned during practical classes (minimum 5, maximum 10 pages). The strategic plan must be submitted in written form to the instructor of the practical course no later than the day of the assessment. (Week 10) 2. Delivery of a PowerPoint presentation based on the submitted strategic plan, with a maximum length of 10 slides, presented by the student delegated by the group. (Week 11)
Description of midterm tests	The purpose of midterm tests is to assess whether students are able to give a written account of the concepts, tools, and strategies learned during the semester, understand and apply the systemic interrelationships among these elements, and demonstrate this knowledge through complex problem-solving tasks. (Week 12) Replacement: Week 13
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted: • during class work, for data collection and information gathering related to tasks • for data collection for certain HF assignments • during preparation for ZH The use of any AI tools is strictly prohibited during assessments and the writing of in-class tests (midterm exams).

Basics of Logistics

Subject name		In Hungarian		Logisztika alapjai					Szintje	A	
		In English		Basics of Logistics					Level	A	
Subject code				DUEN(L)-TVV-212							
Responsible educational unit				Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study											
Number of Lessons								Requirements	Credits (ECTS)	**Language of Education**	
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M	5	**English**	
Correspondence	150/15		5		10		0				
Teacher responsible for the course				Name		Dr. Lajos Veres			Position	College Professor	

Educational goals	The goal of the course is to provide a broad overview on the basic mechanisms and processes of logistics and supply chain management, material flow and warehousing. The course enables students to gain both practical and theoretical knowledge on the logistics processes of procurement, production and distribution, and to become familiar with the mechanisms of material handling, information technology and transportation management.	
Typical delivery methods	Theoretical	Flipchart, blackboard and other multimedia equipment in auditorium
	Practice	Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work.
	Lab	

Requirements

Knowledge

By the end of the course, students will

- understand the basic concepts of logistics
- know the necessary operation mechanisms to successfully manage logistics activities
- know the main laws and regulations applied in contemporary logistics
- know the main strategies and techniques applied in logistics

Ability

Students will be able to:

- Use and apply the basic terms and vocabulary of the profession with confidence
- Synthetize and organize their knowledge and apply it in the appropriate situations
- Identify the main resources and activities in logistics
- Apply the strategic planning tools used in contemporary logistics
- Use and apply the literature of the profession with confidence

Attitude

Students should be:

- Open to classroom case studies, and to the active interpretation of discussed situations.
- Sensitive and critical towards theoretical and practical innovation
- Susceptible to development opportunities for exploitation.

Autonomy and responsibility

Responsible for his/her own development.
Cooperate with the instructor and fellow students, seeks to solve the discussed problems.

	Feel responsible for the development of his/her working environment
Brief description of the subject content	Basic logistics concepts and phenomena. Logistics systems and modules. The flow of materials and information. Procurement and distribution. Warehousing, storing and inventory management. Production management, Transportation systems and forwarding. Supply chain management and the bullwhip effect. Simulations and planning in logistics.
Activity forms of students	Case study analysis, Presentations, Individual work, Frontal class work, Group work, role play.
Compulsory reading and its availability	Jacobs, R.F. - Chase, R.B.: Operations and supply chain management, McGraw Hill, 2011, ISBN 978-0-0771-5162-1, eCorvina link Gourdin, K: Global Logistics management: A competitive advantage for the 21st century, 2nd edition, Wiley-Blackwell, 2006, ISBN 978-1-4051-2713-4, eCorvina link
Recommended reading and its availability	Mangan, John [et al.]: Global logistics and supply chain management. 2nd ed Hoboken: John Wiley & Sons, 2012, ISBN 978-1-119-99884-6, eCorvina link
Hand-in Assignments	Presentation and evaluation of a logistic process and PPT presentation. Deadline the end of the study period/last contact class. It cannot be performed in the exam period.
Description and timing of the mid-term tests	Weeks 6 and 12, additional options are on Week 13. The tests can be retried in the Exam period in accordance with the TVSZ.
Framework and rules for the use of artificial intelligence	The use of AI tools is partially allowed in certain parts of subject, during the preparation of class work and working on the assignments/presentations to be submitted, but only for orientation and information gathering on the certain topics. The collected information should be independently evaluated, validated, systematized, and formulated/presented. It is not allowed to insert AI-generated text directly into the paper/presentation to be submitted. It is recommended to indicate and verify the sources used by the AI, if available. AI tools cannot be used during tests or exams.

Novel techniques of enviromental protection

Name of the subject		in Hungarian		Új környezetvédelmi technikák					Level	Spec	
		in English		Novel techniques of enviromental protection					Code	DUEN-MGT-226 DUEL-MGT-226	
Responsible educational unit				Technical Institute, Department of Energy and Mechanical Engineering							
Name of compulsory prior learning											
Type		Theoretical		Practice		Lab		Requirement	Credit	Language of education	
Full time	150/39	per week	2	per week	0	per week	1	M	5	english	
Part time	150/15	per term	10	per term	0	per term	5				
Teacher responsible for the subject				Name		Dr. Éva Kovács-Bokor			schedule	associate professor	
Training objective and justification of the course (content, output, location in the curriculum)				**Goals, development objectives** Introduce students to the latest environmental techniques and their application, recycling of used lithium batteries.							
Typical delivery methods				Theoretical	For all students in a large lecture hall with a blackboard presentation. Use of projector.						
				Practice							
				Lab	Measurements in laboratories						
				Other							
Requirements (expressed in terms of learning outcomes)				**Knowledge** • Knowledge of the general and specific rules, contexts and procedures for the operation of the technical field. • Familiarity with the terminology, the main contexts and theories related to the field. • Comprehensive knowledge of the main theories of the field in terms of knowledge acquisition and problem solving • methods of problem solving. • Basic knowledge of machine design principles and methods, control procedures and operational processes. • Has an applied knowledge of measurement procedures, their tools, instruments and measuring equipment used in mechanical engineering. • Understand, characterise and model the structure and operation of the structural units and elements of mechanical systems, the design and interrelationship of the system components used.						
				Ability • Ability to apply the most important terminology, theories and procedures of the technical field in the performance of related tasks. • Ability to plan, organise and conduct independent learning. • Ability to identify routine technical problems and to apply the necessary principles and techniques to solve them • to identify, formulate and implement (standard operations in practice) • (using standard procedures).						
				Attitude • It is open to learning about, embracing and authentically communicating professional, technological development and innovation in engineering. • Seeks to solve problems, preferably in cooperation with others. • Have the stamina and tolerance of monotony to carry out practical activities • has the ability to • Applies his/her acquired technical knowledge to gain a thorough understanding of observable phenomena, to describe and explain their laws. • In his/her work, he/she observes and complies with the relevant safety, health, environmental, quality assurance and control requirements.						
				Autonomy and responsibility • In carrying out his/her professional duties, he/she will also cooperate with qualified professionals in other fields (primarily technical, economic and legal).							

	• He/she shares his/her experience with his/her colleagues, thus contributing to their development. • He/she is responsible for the consequences of his/her technical analyses, the proposals he/she makes and the decisions he/she takes.
Short description of the subject content	The expected construction of new types of equipment in line with Chinese emission reduction plans (aimed at developing emission reduction processes and equipment that meet a tenth of the EU limit). Possibilities to improve the efficiency of conventional electrostatic precipitators in coal and other fossil-fired power plants. Electrostatic precipitators with increased efficiency, Bag filters with improved electrostatic charge. Electrostatic cyclones. Venturi high efficiency filters. Design principles for separators using a combination of the above options. Design guidelines. New trends in water treatment. Newer principles and options for biological water purification. Theory and practice of endocrine disruptor removal from water. New noise reduction techniques (interference, new types of attenuation. New methods of odour control, modern methods of odour measurement. Dioxin and PCB abatement. New radioactivity reduction techniques. Processing of red mud, extraction of rare earths and scandium.
Types of student activities	Presentation: Processing of lectures with notes 40%, independent processing of theoretical material 20%, preparation of lab notes 40%
Required literature and contact details	• Endre Kiss: New environmental techniques, Electronic note, 2023, Moodle system
Recommended literature and contact details	• Y. Mizuta: Energy New Environmental Technologies Technology Handbook, JICA-DEED publication, 2003 Proceeding Publication of the Wroclaw International World Conference on Electrostatic Discharge Elimination
Description of tasks to be submitted/measurement reports	Full-time: preparation of 5 measurement reports Part-time: 3 measurement reports
Description and timetable of the workshops	During the semester, for correspondence students in the 2nd and 4th consultation, and for day students in the 6th and 13th week, five theoretical questions from the lectures. The papers are 100-100 marks, with a maximum of 20 marks for each question.

Enterprise Information Systems

Subject name		**In Hungarian**		**Vállalati információs rendszerek**				Szintje	A		
		In English		Enterprise Information Systems				Level	A		
Subject code				DUEN(L)-TVV-120							
Responsible educational unit				Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study				DUEN-TVV-220 Business Economics DUEN-ISF-010 Informatics							
Number of Lessons								**Requirements**	**Credits (ECTS)**	**Language of Education**	
		Theoretical		Practice		Lab					
Full-time	150/39		0		2		0	M	5	**English**	
Correspondence	150/15		0		10		0				
Teacher responsible for the course				Name		Anita Mihálovicsné Kollár		**Position**			

Educational goals	The target of this course is to introduce the students to the enterprise information systems in basic business process approach. The course contains the types, role, and tasks of enterprise information systems and basic knowledge of selecting, implementing, operating and extending these systems. The course enforces the students in the knowledge of system approach, highlights the importance of information management in the business processes. Performing the course, students will be able to navigate in the operative information flow and information management of enterprises and work in teams for implementation, development and integration with other internal and external enterprise information systems.	
Typical delivery methods	Theoretical	In a classroom with the use of projector or computer in each lecture.
	Practice	In a classroom project work, small team and cooperative work with the use of projector or computer in each seminar.
	Lab	
Requirements	**Knowledge** • overviews the functionalities, architecture, data and process model of standard ERP systems, • has a strategic and system-oriented thinking, • knows the principles, policies and processes in extended enterprise information systems and related business and logistic processes.	
	Ability: • applies the theoretical knowledge systematically in practice, • manages the system components individually and in system, • can work and support team in implementation projects of enterprise information systems, • regulates basic-level business processes by enterprise information systems, • overviews the documentation of enterprise information systems and the related software, • understands and applies professional literature, • applies the definitions of specialization professionally.	
	Attitude • opened for the innovations of the specialization, • pursue continuous self-improvement, • able to solve problems alone, • can tackle problems as responsible persons, • self-training ability, • opened for cooperation with professionals on other related fields.	
	Autonomy and responsibility • responsible for self-training,	

	• co-operates with colleagues, • search the solutions for problems, • responsible for the development of work environment, • takes responsible part in forming professional opinions and its explanations.
Brief description of the subject content	The role, place, history, types, integration and general requirements of enterprise information systems in the enterprise. Introduction to a certain enterprise information system and the basic use of it. General system architectures, technologies, functions, data structures and data manipulation. ERP systems, standard systems. SRM, CRM, SCM systems. Functional structure of ERP systems. Organizational structure, Master data, Transactional data and Document flow concept. Type, hierarchy, state and life cycle of the documents. The sales and distribution, procurement, production planning and execution, financial and human capital management functional modules. Order-to-Cash case, Procure-to-Pay, Plan-to-Produce. Controlling and operative decision support. Office automation systems. Management information systems. Selecting and customizing standard ERP systems. Business modelling techniques.
Activity forms of students	Theoretical knowledge acquiring50% Practical tasks and complex work with tutors 30% Individual practical tasks and complex work 20%
Compulsory reading and its availability	• Murray, Martin: Discover logistics with SAP: SAP ERP and SAP SCM, ISBN 978-1-59229-926-3, 2nd ed, Galileo Press, 2014, eCorvina link • Akhtar, Jawad: Production planning control with SAP ERP, ISBN 978-1-59229-868-6, Galileo, 2013, eCorvina link
Recommended reading and its availability	• Simha R. Magal (Author), Jeffrey Word (Author): Integrated Business Processes with ERP Systems 1st Edition, ISBN-13: 978-0470478448, Wiley&Sons, 2012
Hand-in Assignments	Presentation and evaluation of enterprise information system at a specific company and PPT presentation. Deadline the end of the study period/last contact class. It cannot be performed in the exam period.
Description and timing of the mid-term tests	Weeks 6 and 12, additional options are on Week 13. The tests can be retried in the Exam period in accordance with the TVSZ.
Framework and rules for the use of artificial intelligence	The use of AI tools is partially allowed in certain parts of subject, during the preparation of class work and working ont he assignments/presentations to be submitted, but only for orientation and information gathering on the certain topics. The collected information should be independently evaluated, validated, systematized, and formulated/presented. So it is not allowed to insert AI-generated text directly into the paper/presentation to be submitted. It is recommended to indicate and verify the sources used by the AI, if available. AI tools cannot be used during tests or exams.

Logistic Management

Subject name		In Hungarian	Logisztikai menedzsment					Szintje	A	
		In English	Logistic Management					Level	A	
Subject code			DUEN(L)-TVV-214							
Responsible educational unit			Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study			Business logistics DUEN-TVV-121							
Number of Lessons								Requirements	Credits (ECTS)	Language of Education
		Theoretical		Practice		Lab				
Full-time	150/39		2		1		0	M	5	English
Correspondence	150/15		10		5		0			
Teacher responsible for the course			Name		Dr. Levente Rádai			Position	College Pfrofessor	

Educational goals	Today one of the strategic important aspects of organizational competitiveness is the management of actors in supply chain. That's why the basic aim of this course is to develop a certain attitude. After the course the students will be able to approach and understand supply chains as a whole. They will understand that the base of logistic service is awareness of the buyer's value and to apply for this value. This correspondence is the key of business success and in most cases it can be realised only with cooperation with other firms. The supply chain can ensure a frame for this cooperation, if the members of supply chain realize this and have the competences to use this possibility. The learning material enable the students to analyse and identify the connections in supply chains; to define the criteria of supply chains and networks in different sectors; to avoid or decrease the negatives of bullwhip effect. The course is the last course of the Logistic Specialisation, which gives a board view because it focuses on logistic activities among organisations.	
Typical delivery methods	Theoretical	In a classroom with the use of projector or computer in each lecture.
	Practice	-
	Lab	-
Requirements	**Knowledge** Students will • understand and learn the basic terms of logistic management, • know the difference between supply chain and value chain, • know the basic methods and interrelationships of logistic management, • get to know the most important characteristics of supply chains in different sectors.	
	Ability Students will be able • to investigate business challenges from a logistic management aspect, • to determine the features of network, • to avoid or decrease the losses due to bullwhip effect, • recognize and evaluate the synergy effects of tools of logistic management.	
	Attitude They are open and willing to discuss all points of the cases, as well as express their opinion, but without disclosing any important information about the circumstances of their own company. They have sensibility to find potentials for development.	
	Autonomy and responsibility	

	Students feel responsibility for both their development and environment. They cooperate with each other. They have sensibility to find possible resolving opportunities for problems.
Brief description of the subject content	The value chain and creation of double value both for buyers and suppliers. The technical and economic connections of value chain. The customer value and logistic buyer satisfaction. The customer value and the internet. The supply chain: system (network) of business relationships. The role of suppliers. Potential suppliers and the internet. Evaluation of suppliers, the criteria of supplier evaluation in internet. Strategic procurement. The methods and importance of demand anticipation in production logistics. Resource planning systems with buyer's cooperation. Management of customer relationship (CRM). The criteria of CRM systems (soft wares). The importance of services and its logistic problems. International transport. Competitiveness and supply chain management. Integration of supply chain. Measurement of supply chains. Tendencies in supply chain management.
Activity forms of students	Individual work
Compulsory reading and its availability	• Mangan, John [et al.] (2012) Global logistics and supply chain management. 2nd ed Hoboken: John Wiley & Sons, DUE Library
Recommended reading and its availability	• Blanchard, David (2007) Supply chain management: best practices. Hoboken, N.J.: Wiley & Sons, DUE Library
Description of assignments/assessment reports	Presentation of a company operating in a supply chain, evaluation of its role and processes using the methods learned during the course, and presentation of this by the end of the semester. Cannot be made up during the exam period.
Description of assignments/assessment reports	The prerequisite for signing is the completion of weekly online lesson tests. Midterm exams (tests) are held in weeks 6 and 12, with make-up exams in week 13. During the exam period, midterm exams can be made up and corrected in accordance with the TVSZ.
Framework and rules for the use of artificial intelligence	The use of artificial intelligence is partially permitted in certain parts of the course, during class work and when preparing assignments/presentations, for the purpose of familiarizing oneself with the topic and gathering information. However, students are expected to independently evaluate, validate, organize, and formulate/present the information they have gathered. Therefore, text generated by AI cannot be directly inserted into assignments/presentations. It is recommended that sources used by AI be indicated and verified, if available. It cannot be used for tests or midterm exams.

Business Logistics

Subject name		In Hungarian		Vállalati logisztika					Szintje	A	
		In English		Business Logistics					Level	A	
Subject code				DUEN(L)-TVV-121							
Responsible educational unit				Institute for Social Sciences Department of Management and Enterprise Sciences							
Name of Mandatory Preliminary Study				Basics of Logistics DUEN-TVV-212							
Number of Lessons								Requirements	Credits (ECTS)	Language of Education	
		Theoretical		Practice		Lab					
Full-time	150/39		1		2		0	M	5	English	
Correspondence	150/15		5		10		0				
Teacher responsible for the course				Name		Dr. Lajos Veres			Position	College Professor	

Educational goals	The goal of the course is to highlight the importance of business logistics within an organization, and to provide a broad overview of the main processes, methodologies and strategies applied in business logistics. By the end of the course, students will able to plan, operate and analyse information and material management processes, and they will be able to recognize and apply strategic and operational tools during planning and execution of logistics activities	
Typical delivery methods	Theoretical	Flipchart, blackboard and other multimedia equipment in auditorium
	Practice	Flipchart, blackboard and other multimedia equipment in smaller seminar rooms suitable for group work.
	Lab	

Requirements

Knowledge

By the end of the course, students will

- understand the basic concepts of business logistics
- know the necessary operation mechanisms to successfully manage business logistics activities
- be familiar with the internal and external factors influencing logistics activities
- know the main strategies and techniques applied in business logistics

Ability

Students will be able to:

- Use and apply the basic terms and vocabulary of the profession with confidence
- Synthetize and organize their knowledge and apply it in the appropriate situations
- Identify the main resources in business logistics
- Apply the strategic planning tools used in business logistics
- Use and apply the literature of the profession with confidence

Attitude

Students should be:

- Open to classroom case studies, and to the active interpretation of discussed situations.
- Sensitive and critical towards theoretical and practical innovation
- Susceptible to development opportunities for exploitation.

Autonomy and responsibility

- Responsible for his/her own development.

	• Cooperate with the instructor and fellow students, seeks to solve the discussed problems. • Feel responsible for the development of his/her working environment
Brief description of the subject content	Concepts and strategic value of business logistics. Information flow within the company. Logistics and production planning. Warehousing, purchasing, inventory management. Inbound and outbound logistics. Information and ICT in logistics
Activity forms of students	Case study analysis, Presentations, Individual work, Frontal class work, Group work, role play
Compulsory reading and its availability	• Gourdin, K: Global Logistics management: A competitive advantage for the 21st century, 2nd edition, Wiley-Blackwell, 2006, ISBN 978-1-4051-2713-4, eCorvina link • Ghiani,G. - Laporte, G. - Musmano, R.: Introduction to logistics systems management, Wiley, 2013, ISBN 978-1-119-94338-9, eCorvina link
Recommended reading and its availability	• Blanchard, David, Supply chain management: best practices. Hoboken, N.J.: Wiley & Sons, 2007, ISBN 978-047-178141-7, eCorvina link
Description of assignments/assessment reports	Presentation and evaluation of a logistics (sub)system at a specific company and PPT presentation. Deadline the end of the study period/last contact class. It cannot be performed in the exam period.
Description of assignments/assessment reports	Weeks 6 and 12, additional options are on Week 13. The tests can be retried in the Exam period in accordance with the TVSZ.
Framework and rules for the use of artificial intelligence	The use of AI tools is partially allowed in certain parts of subject, during the preparation of class work and working on the assignments/presentations to be submitted, but only for orientation and information gathering on the certain topics. The collected information should be independently evaluated, validated, systematized, and formulated/presented. It is not allowed to insert AI-generated text directly into the paper/presentation to be submitted. It is recommended to indicate and verify the sources used by the AI, if available. AI tools cannot be used during tests or exams.