

1. Subject name, code: Machine elements II.	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: Mid-term grade
6. Number of lessons per week (lecture+ exercise + lab): 2+2+0 Number of consultation hours: 16	7. Credit value: 4
8. Location of the subject: 4th semester	9. Type of lecture: Regular course
10. Prerequisites: Machine elements I.	
11. Department: Department of Innovative Vehicles and Materials	
12. Subject coordinator: Attila Piros, PhD	
13. The teacher of the subject: Attila Piros, Gergely Ivánovics, Béla Csorba	
14. Subject description (published in Neptun) The aim of teaching the subject: The aim of the course Machine elements II is to familiarise students with the type of mechanical drives, for gear, worm, belt and chain. The knowledge to be acquired: Categorization of drive trains. Basics of linear and rotational drive design. Theory and design of kinematic of mechanism. Design and calculation of frame structures. Manufacturing driven of cast, molded, sheetmetal and additive manufactured components. Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): The student will become familiar with the basic facts, interrelationships, limits and boundaries of the knowledge and activity system of the field of design, calculations and verification of drive trains. He/she is able to apply the acquired technical scientific principles, rules, contexts and procedures in solving routine tasks in the field of mechanical engineering. Ability to understand and process technical documentation. Open to general and specific knowledge underpinning the technical discipline. Is able to evaluate realistically the results of his/her own work.	
15. System of assessment and evaluation (published in Neptun) Semester requirements: During the semester, there are one mid-term performance appraisal and an exam at the end of semester. The mid-term performance appraisal can be corrected or made up once. A satisfactory results in the appraisal is a prerequisite for obtaining the exam. The mid-term mark is the final examination mark. Examination requirements:	
16. Study aids, laboratory background:	
17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun): Fazekas László: Gépelemek Tervezési segédlet (H-286). Szendrő Péter (szerk.): Gépelemek, Mezőgazdasági Kiadó, 2007. Zsáry Árpád: Gépelemek I.-II. Tankönyvkiadó, Budapest, 1991. Diószegi György: Gépszerkezetek példatár, Herczeg István: Szerkesztési Atlasz.	

1. Subject name, code: Manufacturing I.	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: end semester exam
6. Number of lessons per week (lecture+ exercise + lab): 2+1+1 Number of consultation hours:	7. Credit value: 4
8. Location of the subject: 4. semester	9. Type of lecture: Regular course
10. Prerequisites: Materials science	
11. Department: Department of Innovative Vehicles and Materials	
12. Subject coordinator: Dr. János Liska	
13. The teacher of the subject: Dr. János Liska	
14. Subject description (published in Neptun) The aim of teaching the subject: The aim is to familiarise students with the computer systems used in industrial technologies, their economic characteristics, and conventional manufacturing processes and their accompanying phenomena. The knowledge to be acquired: Within the course, students will attend lectures on enterprise activity systems, CA techniques, accuracy of engineering technologies, manufacturing and technological processes, how to calculate standard times, the chip formation process, costing and various conventional technologies. In practical lessons, you will learn the methodology of tool edge geometry and in the laboratories you will see demonstrations of the technological variations, machines and accompanying phenomena of turning, drilling, milling, grinding, planing, engraving and hollowing. Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): The student will be able to recognise and apply the processes studied in the previous subjects (Mechanics, Materials, Mechanical Engineering) and apply them (stiffness calculations, sizing, material processes, etc.) to manufacturing technologies. Ability to describe technological processes (including economic characteristics) using conventional technologies (turning, drilling, milling, grinding), to select cutting tools and to apply them in industry.	
15. System of assessment and evaluation (published in Neptun) Semester requirements: Two final papers are written during the semester. Each of these must be passed with at least 50% marks. The dates and locations of the final exams will be agreed with the students by the lecturers of the subject during the semester (Expected dates for the final exams are in weeks 6 and 11). One assignment will be submitted during the semester (to be agreed electronically with the lecturer) and must be completed with a minimum of 50%. Examination requirements: The exam consists of a written and an oral part. The oral test (which follows immediately after the written test) requires a pass mark in the written test (at least 7 correct answers out of 10). There is no mark offered.	
16. Study aids, laboratory background:	
17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun): [1] Kodácsy J.: Gépgyártás . GAMF tankönyv 2010. ISBN 978-963-81-5.[2] Andrew Y. C. Nee: Handbook of manufacturing Engineering and Technology. Volume 2. ISBN 978-1-4471-4669-8. Springer 2015[3] Dudás I.: Gépgyártástechnológia I. ME Kiadó, 2002. ISBN 963-661-342-7.	

1. Subject name, code: Vehicle Dynamics and Transmission Technologies	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: Mid-term grade
6. Number of lessons per week (lecture+ exercise + lab): 2+1+0 Number of consultation hours:	7. Credit value: 4
8. Location of the subject: 4. semester	9. Type of lecture: Regular course
10. Prerequisites: General Vehicle Mechanics	
11. Department: Department of Innovative Vehicles and Materials	
12. Subject coordinator: Levente Balogh, PhD	
13. The teacher of the subject: Levente Balogh, PhD; Attila Widner	
14. Subject description (published in Neptun) The aim of teaching the subject: The aim of the course is to build up dynamic models of different vehicle subsystems using the systematic modelling methodology and Matlab/Simulink. The knowledge to be acquired: Dynamic models of vehicle chassis systems including vehicle engines, batteries, electric engines, mechanical transmissions, steering, suspension and wheel brakes. Modelling of friction, fluid dynamics. Parameter identification and model simplification. Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): The student will become familiar with the systematic modelling methodology and the critical thinking needed for the model verification. Base practice will be acquired in the usage of the physical conservations laws used in the automotive development, and in the implementation and execution of the mathematical representation of the models in Matlab/Simulink software environment.	
15. System of assessment and evaluation (published in Neptun) Semester requirements: During the semester, one final examination will be written and verbally defended, which can be corrected or made up once. A satisfactory result in the final examination is a prerequisite for obtaining a satisfactory mid-semester grade. The mid-term mark is the final examination mark. Examination requirements:	
16. Study aids, laboratory background: Presentations of the lectures, examples and exercise materials shared via Teams.	
17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun): <ol style="list-style-type: none"> 1. K. M. Hangos and I T. Cameron: PROCESS MODELLING AND MODEL ANALYSIS, Academic Press, 2001. 2. Mathworks Academia, https://www.mathworks.com/academia.html?s_tid=gn_acad 3. Dr. Bereczky, Ákos, Dr. Varga, Zoltán: Motor és erőátviteli rendszerek mechatronikája, ISBN 978-963-313-172-5 	

1. Subject name, code: Automotive engines I.	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: Mid-term grade
6. Number of lessons per week (lecture+ exercise + lab): 3+0+2 Number of consultation hours:	7. Credit value: 4
8. Location of the subject: 4. semester	9. Type of lecture: Regular course
10. Prerequisites: Thermology, Fluid Mechanics, Mechanics, Thermology and Fluid Machines	
11. Department: Department of Innovative Vehicles and Materials	
12. Subject coordinator: Zoltán Weltsch, PhD	
13. The teacher of the subject: Balázs László Kereszty	
<p>14. Subject description (published in Neptun)</p> <p>The aim of teaching the subject: The aim of the course Automotive engines I is to provide students with a basic understanding of internal combustion engines, from work processes to design, taking into account fuels and actual designs. During the course, the student acquires the knowledge to be able to understand and master the advanced level curriculum of the second semester of Automotive Engines II, which analyzes the combustion of internal combustion engines in detail.</p> <p>The knowledge to be acquired: Basics of internal combustion engines: thermal summary, theoretical and real cycles, indicated and effective engine characteristics. Operation of four - stroke and two - stroke engines. Geometrical characteristics and design of engines: crankcase, cylinder head, crank mechanism. Kinematics and dynamics of the crank gear, mass compensation. Valve controls, timing. Charging processes for internal combustion engines. Boosted internal combustion engines: purpose of boosting, turbocharging, mechanical and Comprex booster. Conventional fuels, lubricants. The need for lubrication, lubrication systems. Engine cooling, liquid cooling and air cooling. Mixture formation, ignition and combustion in spark ignition and compression ignition engines. Fuel systems for petrol and diesel engines.</p> <p>Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): Comprehensive knowledge of the basic facts, directions and boundaries of the subject area of the technical field. He / her knows the conceptual system and problem solving methods of vehicles and mobile machines. It owns the basic economic, business and legal rules and instruments related to the production and operation of vehicles and mobile machinery. He / her knows the operating principles and structural units of vehicles and mobile machines. He / her knows the measurement procedures used in vehicle technology, their tools, instruments and measuring equipment. Knows the basic design principles, methods, specifications and standards used in vehicle technology, manufacturing technology, control procedures and operating processes. He / her knows the expectations and requirements of the fields of work and fire protection, safety technology and quality assurance related to vehicles and mobile machines, and the regulations concerning environmental protection. Can apply the calculation, modeling principles, methods and technical specifications related to the operation and basic design of vehicles and mobile machines and their systems. Is able to perform a basic analysis of the disciplines that make up the knowledge system of the technical field, to formulate the connections synthetically and to perform adequate evaluation activities. Is able to interpret and characterize the structure and operation of the structural units and elements of vehicles and mobile machines, the design and connection of the applied system components. Capable of the technical regulations related to the operation of vehicle systems and mobile machine systems, the principles of setting up and operating machines and mechanical equipment, and the economic context. Is able to understand and use the literature, computer and library resources of vehicles and mobile machines. He / her is aware of the legal, economic, safety, social, health and environmental consequences of his work and decisions. It makes independent, professionally based decisions even in unexpected decision situations. In the course of his professional duties, he also cooperates responsibly with qualified professionals in other (primary economic and legal) fields.</p>	
<p>15. System of assessment and evaluation (published in Neptun)</p> <p>Semester requirements: The mid-term mark is based on the successful completion of the two written test during the semester, the successful participation in each of the laboratory practices and the timely submission of the laboratory protocols. In case of insufficient test, replacement is possible one time. The duration of the written test is</p>	

45 minutes. The mid-term mark is determined on the basis of the average of the % results of the written test, but a student who did not participate in any of the laboratories cannot receive a valid mid-term mark. In addition to the description of the theoretical background, the laboratory report must contain a description of the measurement and an explanation of the measured results.

The mid-term mark is based on the successful completion of the two written test during the semester. The mid-term mark is determined on the basis of the average of the % results of the tests, but a student who did not participate in any of the laboratories cannot receive a valid mid-term mark.

Examination requirements:

16. Study aids, laboratory background:

17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun):

Basshuysen, Schäfer: Internal Combustion Handbook. SAE International, 2004.

Bosch: Controlling Petrol Engines - Basics and Components. Maróti Könyvkereskedés és Könyvkiadó, Budapest, 2010.

Bosch: Exhaust technology for petrol engines. Maróti Könyvkereskedés és Könyvkiadó, Budapest, 2006.

Bosch: Exhaust technology for diesel engines. Maróti Könyvkereskedés és Könyvkiadó, Budapest, 2006.

1. Subject name, code: Management	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: colloquium
6. Number of lessons per week (lecture+ exercise + lab): 2+1+0 Number of consultation hours:	7. Credit value: 4
8. Location of the subject: 4. semester	9. Type of lecture: Regular course
10. Prerequisites: -	
11. Department: Department of Basic Science	
12. Subject coordinator: Tibor Ferenczy, CSc	
13. The teacher of the subject: dr. József Tóth, Tibor Ferenczy, CSc	
14. Subject description (published in Neptun) The aim of teaching the subject: The aim of the course is to familiarise students with the characteristics and interrelationships of market organisations. They will learn about the groups of internal and external factors influencing firm performance, the structure of organisations, the main strategies. The knowledge to be acquired: Introduction to management. The concept of management. Managers and/or leaders. Managerial roles. The manager's relationship system. The group and the organisation. General structural, functional and dynamic characteristics of organisations. Classical principles and human relations in management. Basic issues in the management of organisational processes. Modern theories of management. The organisational environment and organisational capabilities. Organisational culture. Decision making in organizations. Change management. Organisational forms in management Strategy in organisations. The exercises involve working on the topic of the lecture. Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): Through the understanding of the managerial approach, he/she is able to work in teams with other disciplines to analyse the requirements of a given problem and to develop solutions. You will strive for efficiency and quality in all areas. Ability to work both independently and in a team, and to recognize his/her limitations.	
15. System of assessment and evaluation (published in Neptun) Semester requirements: During the semester, students write two final papers. The duration of the essay is 45 minutes. The assessment is based on the criteria set out in the study and examination regulations. An unsuccessful paper may be made up once. The essays are written in the classroom in the case of attendance or on an electronic platform (Neptun UniPoll) in the case of distance learning. Examination requirements: The exam is a written examination, in accordance with the TVSz. The essays are written in the classroom in the case of attendance or on an electronic platform (Neptun UniPoll) in the case of distance learning.	
16. Study aids, laboratory background: Supporting materials are available on the MeetStreet interface with the current presentation outlines during the term.	
17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun): Compulsory: Educational resources hosted on the MeetStreet interface.	

1. Subject name, code: Enterprise Economics	
2. Name of course, level of education: Vehicle engineer BSc	3. Language: English
4. Subject category: Compulsory subject	5. Evaluation: colloquium
6. Number of lessons per week (lecture+ exercise + lab): 1+1+0 Number of consultation hours:	7. Credit value: 4
8. Location of the subject: 4. semester	9. Type of lecture: Regular course
10. Prerequisites: -	
11. Department: Department of Basic Science	
12. Subject coordinator: Tibor Ferenczy, CSc	
13. The teacher of the subject: Tibor Ferenczy, CSc	
14. Subject description (published in Neptun) The aim of teaching the subject: Developing an overall picture of the company. Discussing and explaining the principles of how a company works. Acquiring knowledge of the most important basic economic concepts, indicators and how to train them. In the framework of seminars, to systematise and supplement students' economic knowledge and to lay the foundations for further economic studies and subjects. The knowledge to be acquired: Enterprise, the company, its aims, forms of enterprise, their characteristics. Functions of a company, objectives. The place of the enterprise in the social system. Outline of the production process, economic evaluation, basic indicators. Income side of the production process, basic categories. Basics of cost management in the enterprise system. Possibilities of grouping costs, characteristics. Classification of costs by form of presentation. Classification of costs according to their relationship with the volume of production. Classification of costs by accountability. Methods of costing Simple unit costing. Unit costing, replacement costing. Machine cost, total cost, net producer price calculation. Profit, income, profitability. Questions of economy, efficiency, methods of determination. Production function. Purpose, concept, forms of planning. Investment and financing, return on investment. Basic concepts of business accounting, assets, accounts. Economic events and assets. Fundamentals of controlling. Marketing, the marketing mix. Basic marketing strategy. Exercises: working through the topics covered in the lecture, solving calculation problems. Professional competences to be acquired (knowledge, skills, attitudes, autonomy and responsibility): The student will be familiar with the concepts and indicators of the management of an economic organisation. Ability to use knowledge in a creative way to manage the resources of the workplace effectively. In carrying out his/her professional duties, he/she also cooperates responsibly with qualified professionals in the field of economics. Can assess the economic consequences of his/her work and decisions.	
15. System of assessment and evaluation (published in Neptun) Semester requirements: Mid-term study requirements: six essays in the practicals (2nd, 4th, 6th, 8th, 10th and 12th week). Papers cannot be made up or corrected. Passing the examination is conditional upon 50% of the points being obtained. The essays are written in the classroom in the case of attendance or on an electronic platform (Neptun UniPoll) in the case of distance learning. Examination requirements: Colloquium, written form. The essays are written in the classroom in the case of attendance or on an electronic platform (Neptun UniPoll) in the case of distance learning.	
16. Study aids, laboratory background: Supporting materials are available on the MeetStreet interface with the current presentation outlines during the term.	
17. List of the 2-5 most important compulsory or recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, ISBN) (published in Neptun): Compulsory: Educational resources hosted on the MeetStreet interface.	

