Faculty of Mechanical Engineering

IMPORTANT NOTES

If for one subject you can find several different types (lecture, practice, laboratory) of courses then please choose one and only one course from each type in order to be able to perform the subject's requirements successfully.Civil Engineering courses are on the website seperately. Courses chosen from the offer of Faculty of Civil Engineering will be checked and arranged individually by the departmental coordinator.

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTBG11	Fluid Mechanics	Mid-semester mark	6

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L1	English	TUE:10:15-12:00(AE_NAGYLAB)
Lecture	A-2024t-E	English	MON:10:15-12:00(KF87)
Practice	A-2024t-G1	English	TUE:08:15-10:00(KF82)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TBG11#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATBG11https://gpk.bme.hu/en/content/42#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTBG15	Technical Acoustics and Noise Control	Exam	3

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L-prs	English	TUE:16:15-18:00(AE_NAGYLAB)
Lecture	A-2024t-E	English	THU:14:15-16:00(KF87)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TBG15#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATBG15https://gpk.bme.hu/en/content/42#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTBG36	Computational Fluid Dynamics	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L1	English	TUE:08:15-10:00(AE_CFDLAB)
Laboratory	A-2024t-L3	English	TUE:12:15-14:00(AE_CFDLAB)
Laboratory	A-2024t-L2	English	TUE:10:15-12:00(AE_CFDLAB)
Lecture	A-2024t-E	English	MON:10:15-12:00(KF81,KF83)

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Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTBKSD	Final Project	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	A-2024t-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TBKSDhttp://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATBKSDhttps://gpk.bme.hu/en/content/42#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTBKSZ	Summer Internship	Signature	0

Course type	Course code	Course language	Timetable information
Practice	A-2024t-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TBKSZ#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATBKSZhttps://gpk.bme.hu/en/content/42#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNKDA	Master Thesis Project A	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	A-2024t-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNKDA#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNKDAhttps://gpk.bme.hu/en/content/42#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNKDB	Master Thesis Project B	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	A-2024t-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNKDB#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNKDBhttps://gpk.bme.hu/en/content/42#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNKPR	Teamwork Project	Mid-semester mark	6

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNKPR#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNKPRhttps://gpk.bme.hu/en/content/42#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNKSG	Internship M	Signature	0

Course type	Course code	Course language	Timetable information
Practice	A-2024t-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNKSG#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNKSGhttps://gpk.bme.hu/en/content/42#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNW01	Advanced Fluid Mechanics	Exam	4

Course type	Course code	Course language	Timetable information
Lecture	A-2024t-E	English	WED:12:15-15:00(KF87)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNW01#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNW01https://gpk.bme.hu/en/content/42#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNW03	Fluid Mechanics Measurements	Mid-semester mark	5

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L	English	TUE:14:15-16:00(AE_NAGYLAB)
Lecture	A-2024t-E	English	MON:12:15-14:00(KF87)

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Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNW21	Open Source Computational Fluid Dynamics	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L2	English	WED:12:15-14:00(AE_CFDLAB)
Laboratory	A-2024t-L1	English	WED:09:15-11:00(AE_CFDLAB)
Lecture	A-2024t-E	English	MON:12:15-14:00(AE_MERLEG-T)

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Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTNW22	Aero-Elasticity	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	A-2024t-E	English	WED:16:15-18:00(AE_MERLEG-T)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGE%C3%81TNW22#160;http://www.ara.bme.hu/oktatas/tantargy/NEPTUN/BMEGEATNW22https://gpk.bme.hu/en/content/42#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEÁTOF01	Individual Project	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Laboratory	A-2024t-L-szabval	English	

Subject code	Subject name	Requirement	ECTS credit
BMEGEÉEBG61	Processes and Equipment of Chemical Industry	Exam	7

Course type	Course code	Course language	Timetable information
Laboratory	A7	English	THU:09:15-12:00
Lecture	A5	English	MON:12:15-15:00(D102)
Practice	A6	English	THU:12:15-14:00(D102)

Aim of the subject: Theory and practice of mechanical, hydromechanical, thermal, and diffusion processes often used in chemical, food industry, biotechnology and environmental protection. Equipment, sizing and operation aspects. Topics of the subject: 1. Size reduction, milling. Liquid mixing. Types of impellers, baffles. Power number function. Example. Non-Newtonian liquids and their mixing. Settling in gravitation. Suspension types, measurement of settling velocity. Example. 2. Settling in centrifuges, Construction and operation of cyclones. Separation efficiencies. 3. Surface filtration. Basic differential equation, solutions. Measurement of filtration parameters. Example. Liquid and gas filters. 4. Heat transfer. Calculation of heat transfer surface. Heat transfer equations for sensible and insensible heat transport. 5. Calculation of heat transfer coefficient. Influence of finned surface. 6. Heat exchanger constructions, operation aspects. 7. Concentration rise of solutions by thermal method: evaporation. Mass and enthalpy balance equations in the case of one-effect evaporator. Determination of heat transfer surface. Vapor reuses facilities. Economical aspects of multi-effect evaporators. Evaporator constructions. 8. Solid handling in dryers. Drying mechanism. Psychometric charts and ratio. Wet bulb temperature. Use of psychometric chart, mixing of gas flows. Drying curves, drying time. Example. 9. Absorption of gases. Application. Equilibrium curve. Material balance. Operating line. Height of packed column. Method of transfer units. Number of theoretical plates. Problem to solve for absorption. Liquid-liquid extraction. Industrial applications. Requirements for the solvent. Equilibrium conditions. Triangular diagram, bimodal solubility curve basic notions: distribution coefficient, mass ratio, liquid (solvent to feed ratio), extraction factor. Solvent recovery. Extraction methods. Single stage batch extraction. Multiple contact batch extraction. Perforation. Countercurrent extraction. Extraction calculations. Extraction equipment. Solid-liquid extraction. Steps of the process. Equipment. Factors determining the method of extraction. Factors influencing the rate of the process. Adsorption. Adsorbents and adsorption processes. Fixed-bed adsorbers. Gas drying equipment. Pressure-swing adsorption. Adsorption from liquids. Adsorption isotherms. Types of isotherms. Concentration patterns in fixed beds. Breakthrough curves. Scale up. Length of unused bed. effect of feed concentration URL: http://www.epget.bme.hu/hu/14-oktatas/bsc/162-processes-and-equipment-of-chemical-industry

Subject code	Subject name	Requirement	ECTS credit
BMEGEÉEBX5A	Energy in buildings	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Lecture	A05	English	
Practice	A06	English	

Subject code	Subject name	Requirement	ECTS credit
BMEGEÉEBX7C	Renewable energy system	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Laboratory	A08	English	
Lecture	A07	English	

Subject code	Subject name	Requirement	ECTS credit
BMEGEENBGHK	Heat Transfer G	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Lecture	24-2-DEU-E	German	
Lecture	24-2-ENG-E	English	MON:16:15-18:00(D224)
Practice	24-2-DEU-G	German	
Practice	24-2-ENG-G1	English	WED:10:15-12:00(D318)

Subject code	Subject name	Requirement	ECTS credit
BMEGEENBKSD	Final project	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	24-2-ENG-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENBKSD#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEENMLCA	LCA of Power Generation Systems	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Laboratory	24-2-ENG-LAB	English	
Lecture	24-2-ENG-E	English	

AimThe course aims to study the environmental impact of energy production systems. Students learn the basic concepts, standards, most commonly used types and areas of application of life cycle assessment (LCA). In their semester project assignment, students determine the environmental impact of an energy system of their choice using life cycle assessment methodology. Within the framework of their project task, they learn to use the software required for modern life cycle analysis (e.g. openLCA, GaBi, EASETECH).Learning outcomesCompetences that can be acquired by completing the courseKnowledgeThe student is aware of the principles and importance of a life cycle approach. Knows the basic concepts of life cycle assessment (LCA), the most commonly used types and standards. Has comprehensive knowledge of life cycle assessment methodology. The student is informed about the environmental quantities typical of energy production and user (production) facilities. Knows the databases, models and software that can be used during life cycle assessment. Understands the dangers of shifting impacts between different environmental impact categories. The student is aware of the basic environmental mechanisms of different environmental impact categories. Understands the application areas of life cycle assessment and the specifics of each area for LCA. The student is informed about the range, types, and availability of primary and secondary data that can be used in a life cycle assessment. Understands the process of critically reviewing the results of life cycle assessment and the methods of assessing data quality.AbilityDescribes real technology systems with life cycle models. The student is able to assess environmental impacts in multiple ways. The student can identify complex environmental problems, explore, formulate and (using learned practical application) the theoretical and practical background needed to analyze them. The student solves complex, computationally intensive tasks using IT skills. The student can express his or her thoughts orally and in writing. Interprets the results of a life cycle assessment (LCA). Creates the conceptual life cycle model using the appropriate target software. Selects secondary data sources and databases for the life cycle model. Defines the life cycle boundaries of energy systems. Use the life cycle assessment results in the application areas that meet the set goals.AttitudeThe student constantly monitors his or her work, results and conclusions. The student expands his or her knowledge of energy management and sustainability through continuous learning. Open to the use of information technology tools. The student seeks to learn about and routinely use environmental tools needed to solve energy management problems. The student develops the ability to provide accurate and error-free problem solving, engineering precision and accuracy. The student applies energy efficiency, sustainability and environmental awareness in solving life cycle assessment tasks. The student monitors changes in legislation. The student publishes his or her results under professional rules. The student publishes his or her opinions and views without offending others.General rulesLearning outcomes are assessed based on two mid-year has written performance measures (one partial and one summative academic performance assessment). Summarizing academic performance evaluation: a complex, written way of evaluating the competence-type competence elements of the subject and knowledge in a closed examination, the dissertation asks for the necessary lexical knowledge during the performance evaluation. The available working time is 30 minutes. Partial performance evaluation (project task): a complex way of evaluating the knowledge, ability, attitude, and independence and responsibility type competence elements of the subject, which is the individual homework.Assessment methodsDetailed description of mid-term assessmentsMid-term assessment No. 1Type:diagnostic assessmentNumber:1Purpose, description:Checking knowledge-type competencies in writing (level assessment) is necessary to complete the subject successfully. The evaluation will take place in electronic form at the lecture, with a maximum duration of 30 minutes and 30 points. The summative assessment can be improved/replaced during the replacement period. ---------- ----------.Mid-term assessment No. 2Type:formative assessment, project-based, complexNumber:1Purpose, description:The basic aim of the partial performance assessment is to examine the existence of application skills and learning outcomes

belonging to the attitude, autonomy and responsibility competence group. The way to do this is to create a life cycle model in 2-3 groups and then present the results to the laboratory practice group. The topic of the tasks is chosen individually, but it is also possible to choose from a predefined list. The chosen topics must be finalized by the third week of education. The requirements and evaluation principles of the prepared model are included in terms of reference. The students can get up to 70 points with this task.Detailed description of assessments performed during the examination periodThe subject does not include assessment during the examination period.The weight of mid-term assessments in signing or in final gradingIDProportionMid-term assessment No. 130 %Mid-term assessment No. 270 %The weight of partial exams in gradeThere is no exam belongs to the subject.Determination of the gradeGradeECTSThe grade expressed in percentsvery good (5)Excellent [A]above 90 %very good (5)Very Good [B] 85 % - 90 %good (4)Good [C]72 % - 85 %satisfactory (3)Satisfactory [D]65 % - 72 %sufficient (2)Pass [E]50 % - 65 %insufficient (1)Fail [F]below 50 %The lower limit specified for each grade already belongs to that grade.Attendance and participation requirementsThe lack of the value means that there is no attendance requirement.At least#160;70% of#160;laboratory practices (rounded down) must be actively attended.#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNKDA	Master Thesis Project A	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	24-2-ENG-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNKDA#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNKDB	Master Thesis Project B	Mid-semester mark	15

Course type	Course code	Course language	Timetable information
Practice	24-2-ENG-G	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNKDB#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNWAT	Advanced Thermodynamics	Exam	4

Course type	Course code	Course language	Timetable information
Lecture	24-2-ENG-E	English	TUE:10:15-12:00(D224)
Practice	24-2-ENG-G1	English	THU:08:15-10:00(D224)
Practice	24-2-ENG-G2	English	THU:08:15-10:00(D224)

ONLY FOR MSc STUDENTS!https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNWAT

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNWCO	Combustion	Mid-semester mark	5

Course type	Course code	Course language	Timetable information
Lecture	24-2-ENG-E	English	MON:10:15-12:00(D318)
Practice	24-2-ENG-G	English	TUE:12:15-14:00(D318)

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Important note: ONLY FOR MSc STUDENTS!According to the rules, any MSc student can be enrolled. However, this subject strongly builds on your existing Fluid dynamics, Thermodynamics, and Heat transfer knowledge. Completion of Heat engines is recommended.CONTENTS:https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNWCOThis subject is discussing combustion from both fundamental (first half of the semester) and practical point of views (second half of the semester).1. Introduction, administration. State-of-the-art devices and technologies. Gross reactions.2. Flame stabilization, fluid dynamics, and non-dimensional numbers.3. Reaction pathways and pollutant formation.4. Fuel properties in general.5. Gaseous, liquid, and solid fuels.6. Fuel evaporation.7. Midterm exam 1.8. Combustion modes and turbulence.9. Combustion safety and control.10. Free jet and gas burners.11. Atomization and liquid fuel burners.12. Solid fuel burners.13. Modern combustion chambers.14. Midterm exam II.REQUIREMENTS2 midterm exams1 project/homework

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNWPR	Teamwork Project	Mid-semester mark	6

Course type	Course code	Course language	Timetable information
Laboratory	24-2-ENG-LAB	English	

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ONLY FOR MSc STUDENTS!
https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNWPR

Subject code	Subject name	Requirement	ECTS credit
BMEGEENNWTP	Thermal Physics	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Laboratory	24-2-ENG-LAB	English	THU:17:15-18:00(D216)
Lecture	24-2-ENG-E	English	THU:16:15-17:00(D216)

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ONLY FOR MSc STUDENTS!
https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEENNWTP

Subject code	Subject name	Requirement	ECTS credit
BMEGEGIBXCA	Introduction to CAD	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Laboratory	ERASMUS2	English	WED:12:15-14:00(D303)
Laboratory	ERASMUS1	English	MON:08:15-10:00(R110,R109)
Lecture	A_EA	English	WED:08:15-10:00(R108)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEGIBXCA

Subject code	Subject name	Requirement	ECTS credit
BMEGEGTAG92	Machine tools and manufacturing systems	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	1	English	FRI:10:15-12:00(T47)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEGTAG92#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEGTBG01	Manufacturing	Exam	5

Course type	Course code	Course language	Timetable information
Laboratory	GA3	English	FRI:12:15-14:00
Lecture	A0	English	THU:14:15-16:00(G116)
Practice	GA1	English	WED:14:15-16:00(G113)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEGTBG01#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEGTNWAM	Advanced Manufacturing	Mid-semester mark	5

Course type	Course code	Course language	Timetable information
Laboratory	A2	English	FRI:09:15-12:00(G116)
Lecture	A1	English	FRI:08:15-09:00(G116)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEGTNWAM#160;#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEMIBXGI	Mechanical engineering informatics	Mid-semester mark	6

Course type	Course code	Course language	Timetable information
Laboratory	24t_A_L01	English	THU:08:15-10:00(D502); FRI:08:15-10:00(D502)
Laboratory	24t_A_L02	English	THU:10:15-12:00(D502); FRI:10:15-12:00(D502)
Lecture	24t_A_E	English	FRI:12:15-14:00(D401)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMIBXMT	Measurement techniques	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Laboratory	24t_A_L02	English	TUE:10:15-12:00(D532)
Laboratory	24t_A_L01	English	TUE:10:15-12:00(D532)
Lecture	24t_A_E	English	MON:12:15-14:00(D401)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEMIBXMT#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEMMBXM4	Vibrations	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Lecture	LEC	English	TUE:12:15-14:00(KF83)
Practice	SEM1	English	TUE:14:15-15:00(KF83)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMMBXN2	Strength of materials	Exam	4

Course type	Course code	Course language	Timetable information
Lecture	LEC	English	TUE:14:15-16:00(KF87)
Practice	SEM1	English	THU:12:15-14:00(KF87)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMMNWAM	Advanced Mechanics	Exam	4

Course type	Course code	Course language	Timetable information
Lecture	LEC	English	MON:16:15-18:00(KF81); THU:16:15-17:00(KF81)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMMNWMV	Machine Tool Vibration	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	LEC	English	MON:16:15-18:00(MM_I29)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMTAGE3	Novel engineering materials	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	Ea	English	TUE:12:15-14:00(MT103)

BSc in Mechanical Engineering 2N-AG0/2NAAG0 Design and Technology Specialization compulsory / elective subject SUBJECT DATA SHEET AND REQUIREMENTS last modified: 29th May 2014 NOVEL ENGINEERING MATERIALS KORSZERŰ MÉRNÖKI ANYAGOK 1 Code Semester Nr. or fall/spring Contact hours/week (lect.+semin.+lab.) Requirements p / e / s Credit Language BMEGEMTAGE3 spring 2+0+0 p 3 English 2. Subject's responsible: Name: Position: Affiliation (Department): Dr. István Mészáros associate professor Dept. of Materials Science and Engineering 3. Lecturer: Name: Position: Affiliation (Department): Dr. István Mészáros associate professor Dept. of Materials Science and Engineering 4. Thematic background of the subject: The subject gives an introduction to the up-to-date research fields of materials science. Special attention is paid to the novel materials used in engineering appications. 5. Compulsory / recommended prerequisites: Compulsory: (subject's name, code) Suggested: (subject's name, code) 6. Main aims and objectives, learning outcomes of the subject: The structure, properties of novel structural and functional materials used in mechanical and electrical engineering applications and their testing methods are discussed. The technological processes and their practical aspects are discussed. Fundamental concepts of material structures and the principles of material properties and their relations. Special attention is paid to materials used in the electronics industries including their production and technological usability. 7. Method of education: Lecture 2 h/w, seminar 0 h/w, laboratory 0 h/w 8. Detailed thematic description of the subject (by topic, min. 800 character): Topics include: Basics of crystallography, crystal defects, dimensional effects, nano-, micro-, and macrostructures, multi-component systems. Thermal behavior, diffusion mechanisms. Phase transformations, heat treatments, recrystallization. Mechanical properties and their measurements. Types and properties of novel structural and stainless steels. Fundamental new concepts in steel development. High entropy alloys. Alloys used in biomedical engineering applications. Materials deterioration processes such as corrosion, fracture, fatigue (mechanical, thermal, etc.), creep, migration. Microscopy, electron microscopy, X-ray diffraction. Conduction properties, conductive, superconductive, resistive, and insulator materials. Semiconductor materials. Effects of material properties on semiconductor materials used in microelectronics and in integrated optoelectronics. Insulator, dielectric and ferro-electric materials. Production of semiconductor single crystals and the related measurement techniques (Hall, CV). Non-metallic materials in electrotechnics. Magnetic properties and the types of magnetic materials used in industrial applications. Intelligent materials. Shape memory and superelastic alloys. 9. Requirements and grading a) in term-period: participation on lectures, mid-semester test in the 7th week of the semester b) in examination period: written and oral exam c) Disciplinary Measures Against the Application of Unauthorized Means at Mid-Terms, Term-End Exams and Homework Supplement to 1/2013. (I. 30.) Dean's Order (Codicil): The following students are subject to disciplinary measures. (a). Those students who apply unauthorized means (book, lecture notes, etc.), different from those listed in the course requirements and/or adopted by the lecturer in charge of the course assessment, in the written mid-term exams taken, and/or invite/accept any

assistance of fellow students, with the exception of borrowing authorized means, will be disqualified from taking further mid-term exams in the very semester as a consequence of their action. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission option. Final term-end results in courses with practical mark will automatically become Fail (1), the ones with exam requirements will be labelled Refused Admission to Exams. (b). Those students whose homework verifiably proves to be of foreign extraction, or alternatively, evident results or work of a third party, are referred to as their own, will be disqualified from taking further assessment sessions in the very semester as a consequence of their action. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission options. Final term-end results in courses with practical mark will automatically become Fail (1), ones with exam requirements will be labelled Refused Admission to Exams. (c). Those students who apply unauthorized means (books, lecture notes, etc.), different from those listed in the course requirements and/or adopted by the lecturer in charge of the course assessment, in the written term-end exams taken, and/or invite/accept any assistance of fellow students, with the exception of borrowing authorized means, will immediately be disqualified from taking the term-end exam any further as a consequence of their action, and will be inhibited with an automatic Fail (1) in the exam. No further options to sit for the same exam can be accessed in the very same exam period. (d) Those students who alter, or make an attempt to alter the already corrected, evaluated, and distributed test or exercise/problem, i.) as a consequence of their action, will be disqualified from further assessments in the respective semester. Further to this, all of their results gained in the very semester will be void, can get no term-end signatures, and will have no access to Late Submission options. Final term-end results in courses with practical mark will automatically become Fail (1), the ones with exam requirements will be labelled Refused Admission to Exams; ii.) and will immediately be inhibited with an automatic Fail (1) in the exam. No further options to sit for the same exam can be accessed in the very same exam period. 10. Retake and repeat 11. Consulting opportunities: Consultation hours: By email appointments 12. Reference literature (compulsory, recommended): · Books: W.D. Callister: Materials Science and Engineering (John Whiley and Sons, ISBN: 0-471-32013-7), D.C. Jiles: Principles of Materials Evaluation (CRC Press, ISBN: 13-978-0-8493-7392-3) · Downloadable materials: www.att.bme.hu 13. Home study required to pass the subject: Contact hours 28 h/semester Home study for the courses 28 h/semester Home study for the mid-semester checks 10 h/check Preparation of mid-semester homework - h/homework Home study of the allotted written notes 9 h/semester Home study for the exam 15 h/semester Totally: =90 h/semester 14. The data sheet and the requirements are prepared by: Name: Title: Affiliation (Department): Dr. István Mészáros associate professor Dept. of Materials Science and Engineering v\:* {behavior:url(#default#VML);} o\:* {behavior:url(#default#VML);} w\:* {behavior:url(#default#VML);} .shape {behavior:url(#default#VML);} /* Style Definitions */ table.MsoNormalTable {mso-style-name:"Normál táblázat"; mso-tstyle-rowband-size:0; mso-tstyle-colband-size:0; mso-style-noshow:yes; mso-style-priority:99; mso-style-qformat:yes; mso-style-parent:""; mso-padding-alt:0cm 5.4pt 0cm 5.4pt; mso-para-margin:0cm; mso-para-margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:10.0pt; font-family:"Times New Roman","serif";}

Subject code	Subject name	Requirement	ECTS credit
BMEGEMTBGA1	Materials science and testing	Exam	6

Course type	Course code	Course language	Timetable information
Laboratory	AL2B	English	MON:14:15-16:00
Laboratory	AL2A	English	MON:14:15-16:00
Laboratory	AL1A	English	MON:14:15-16:00
Laboratory	AL1B	English	MON:14:15-16:00
Lecture	AEa	English	WED:10:15-12:00(MT103); THU:14:15-16:00(G120)

Subject code	Subject name	Requirement	ECTS credit
BMEGEMTBVS2	Integrity of engineering structures 2	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	Ea	German	

Subject code	Subject name	Requirement	ECTS credit
BMEGEPTBG01	Polymer Materials Science and Engineering	Exam	6

Course type	Course code	Course language	Timetable information
Laboratory	LAB	English	FRI:08:15-10:00(MT_PTLAB)
Lecture	LECT	English	WED:08:15-10:00(KF82); THU:08:15-10:00(KF82); THU:08:15-10:00(KF82)

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.cs3270F94{margin:0pt 0pt 0pt 0pt;text-align:left;text-indent:0pt}
SUBJECT DATASHEET:https://oktatas.gpk.bme.hu/tad/en/tantargy/1215/nyomtat

Subject code	Subject name	Requirement	ECTS credit
BMEGEPTBGE1	Composites technology	Exam	4

Course type	Course code	Course language	Timetable information
Laboratory	LAB	English	MON:14:15-16:00(MT_PTLAB)
Lecture	LECT	English	MON:10:15-12:00(T200)

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Subject datasheet:https://oktatas.gpk.bme.hu/tad/en/tantargy/1016/nyomtat

Subject code	Subject name	Requirement	ECTS credit
BMEGEVÉAG03	Processes and Equipment of Chemical Industry	Exam	5

Course type	Course code	Course language	Timetable information
Lecture	A46	English	
Practice	A47	English	

Aim of the subject: Theory and practice of mechanical, hydromechanical, thermal, and diffusion processes often used in chemical, food industry, biotechnology and environmental protection. Equipment, sizing and operation aspects. Topics of the subject: 1. Size reduction, milling. Liquid mixing. Types of impellers, baffles. Power number function. Example. Non-Newtonian liquids and their mixing. Settling in gravitation. Suspension types, measurement of settling velocity. Example. 2. Settling in centrifuges, Construction and operation of cyclones. Separation efficiencies. 3. Surface filtration. Basic differential equation, solutions. Measurement of filtration parameters. Example. Liquid and gas filters. 4. Heat transfer. Calculation of heat transfer surface. Heat transfer equations for sensible and insensible heat transport. 5. Calculation of heat transfer coefficient. Influence of finned surface. 6. Heat exchanger constructions, operation aspects. 7. Concentration rise of solutions by thermal method: evaporation. Mass and enthalpy balance equations in the case of one-effect evaporator. Determination of heat transfer surface. Vapor reuses facilities. Economical aspects of multi-effect evaporators. Evaporator constructions. 8. Solid handling in dryers. Drying mechanism. Psychometric charts and ratio. Wet bulb temperature. Use of psychometric chart, mixing of gas flows. Drying curves, drying time. Example. 9. Absorption of gases. Application. Equilibrium curve. Material balance. Operating line. Height of packed column. Method of transfer units. Number of theoretical plates. Problem to solve for absorption. Liquid-liquid extraction. Industrial applications. Requirements for the solvent. Equilibrium conditions. Triangular diagram, bimodal solubility curve basic notions: distribution coefficient, mass ratio, liquid (solvent to feed ratio), extraction factor. Solvent recovery. Extraction methods. Single stage batch extraction. Multiple contact batch extraction. Perforation. Countercurrent extraction. Extraction calculations. Extraction equipment. Solid-liquid extraction. Steps of the process. Equipment. Factors determining the method of extraction. Factors influencing the rate of the process. Adsorption. Adsorbents and adsorption processes. Fixed-bed adsorbers. Gas drying equipment. Pressure-swing adsorption. Adsorption from liquids. Adsorption isotherms. Types of isotherms. Concentration patterns in fixed beds. Breakthrough curves. Scale up. Length of unused bed. effect of feed concentration URL: http://www.epget.bme.hu/hu/14-oktatas/bsc/162-processes-and-equipment-of-chemical-industry

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGBG06	Individual project 1.	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Laboratory	AnL-HDR	English	
Laboratory	AnL-ARA	English	
Laboratory	AnL-ÉPGET	English	
Laboratory	AnL-EGR	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEVGBG06#160;Independent Study 1 BMEGEVGBG06 One-semester long individual project work. 4 hours/4 credits.

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGBV08	Individual project 2.	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Laboratory	AnL-HDR	English	

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGBX01	Fluid Machinery	Exam	4

Course type	Course code	Course language	Timetable information
Laboratory	AnLpar	English	FRI:08:15-10:00(L-HIDROLAB)
Laboratory	AnLlan	English	FRI:08:15-10:00(L-HIDROLAB)
Lecture	AnE	English	WED:08:15-10:00(KF84)

Practice	AnGylan	English	FRI:08:15-10:00(KF85)
Practice	AnGypar	English	FRI:08:15-10:00(KF85)

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEVGBX01#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGNW21	Unsteady Flow in Pipe Networks	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	AnE	English	
Practice	AnGy	English	

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGNWPR	Teamwork Project	Mid-semester mark	6

Course type	Course code	Course language	Timetable information
Laboratory	AnL	English	

https://oktatas.gpk.bme.hu/tad/en/tantargy/BMEGEVGNWPR#160;

Subject code	Subject name	Requirement	ECTS credit
BMEGEVGNX28	Theoretical acoustics	Mid-semester mark	3

Course type	Course code	Course language	Timetable information
Lecture	AnE	English	WED:12:15-14:00(D327)