

Course descriptions

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COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KEF/1-FYZ-232/15		Course title: Advanced Programming			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 1 / 2 per level/semester: 13 / 26 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: elaboration of homework for individual lectures. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: The graduate of the course will acquire the skills necessary for the numerical solution of simple physical problems and will learn the basic algorithms of numerical calculations.					
Class syllabus: Numerical stability of simple iteration schemes. Transition from a continuous problem to a discrete one. Numerical solution of the wave equation. Nonlinear iteration schemes. Numerical calculation of integrals. Random numbers. Differential equations: Runge-Kutta methods. Systems of differential equations. Simple physical models, firing method, time evolution of nonlinear physical models, Brownian motion. Simple integral equation, Optimization.					
Recommended literature: W. H. Press et al.: Numerical Recipes. Cambridge Univ. Press, 1992					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 187					
A	B	C	D	E	FX
56,68	10,16	9,63	4,81	7,49	11,23
Lecturers: prof. RNDr. Peter Markoš, DrSc., doc. RNDr. Peter Papp, PhD.					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAG/1-FYZ-115/13	Course title: Algebra and Geometry (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 1 per level/semester: 39 / 13 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 3.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: test Examination: written and oral examination Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 20/80	
Learning outcomes: After completing the course the student will master the basic concepts and methods of linear algebra will be able to use them in geometry and physics.	
Class syllabus: Sets and representations, fields and vector spaces, basics of matrix calculus, systems of linear equations, linear subspaces and linear independence, basis and dimension, linear representations, matrix of linear representation, inverse matrices and transition matrices, base change, affine subspaces, determinants.	
Recommended literature: Linear Algebra and Geometry: A Journey of Three Dimensions with Overlaps in Related Fields / Pavol Zlatoš. Bratislava: Albert Marenčin, 2011; electronic version available at http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf We grow linear algebra / Luboš Motl, Miloš Zahradník. Prague: Karolinum, 2002 Lectures on Linear Algebra and Geometry / Július Korbaš, Štefan Gyurki. UK Publishing House, Bratislava, 2013	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 407					
A	B	C	D	E	FX
14,25	18,92	19,16	16,22	24,57	6,88
Lecturers: prof. RNDr. Pavol Zlatoš, PhD., Mgr. Nina Hronkovičová					
Last change: 18.05.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAG/1-FYZ-160/13		Course title: Algebra and Geometry (2)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 1 per level/semester: 39 / 13 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 271					
A	B	C	D	E	FX
19,56	22,88	19,56	22,88	12,92	2,21
Lecturers: prof. RNDr. Pavol Zlatoš, PhD., Mgr. Nina Hronkovičová					
Last change: 15.01.2018					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAG/1-FYZ-216/15		Course title: Algebra and Geometry (3)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 1 per level/semester: 26 / 13 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: test 50% Exam: exam 50% Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50					
Learning outcomes: After completing the course the student will know the basic as well as some more advanced concepts, results and methods of group theory, as well as associative and Lie algebras, and will be able to actively use them in the analysis of structural symmetries in geometry, mathematical analysis and physics.					
Class syllabus: Introduction to group theory, Transformation groups, Linear and affine groups, Isometric groups (Euclidean, Lorentz and Poincaré groups), Linear algebras, Lie algebras of matrix groups (continuous components, homotopies, overlapping homomorphisms).					
Recommended literature: Linear Algebra and Geometry: A Journey of Three Dimensions with Overlaps in Related Fields / Pavol Zlatoš. Bratislava: Albert Marenčin, 2011; electronic version available at http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf We grow linear algebra / Luboš Motl, Miloš Zahradník. Prague: Karolinum, 2002					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 34					
A	B	C	D	E	FX
38,24	32,35	17,65	11,76	0,0	0,0

Lecturers: prof. RNDr. Pavol Zlatoš, PhD.
Last change: 09.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAFZM/1-FYZ-421/15	Course title: Astronomy and Astrophysics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous Assessment (100%): home assignments 40points, test 60points Approximate scale of final grades: A 91%, B 81%, C 71%, D 61%, E 51% Continuous Assessment / Final Examination: 100/0 Scale of assessment (preliminary/final): 100/0	
Learning outcomes: The student will gain basic knowledge of astronomy and astrophysics - the basics of spherical astronomy, celestial mechanics, the planetary system, the formation and evolution of stars, galaxies and galactic systems. After completing the course, students will be sufficiently prepared to continue in the master's degree in astronomy and astrophysics.	
Class syllabus: Subject of astronomy; coordinate systems, transformations of coordinate systems; time and calendar, types of time, refraction, aberration, parallax, precession, nutation, self - movement of stars, position reductions, catalogs and yearbooks; two-body problem, equations of motion, Kepler's laws, velocities, anomalies, Kepler's equation, trajectory elements; solar system - structure, geocentric orbits, physical characteristics of solar system bodies - methods of determination, inner planets, Earth-Moon, outer planets, small bodies of the solar system - comets, asteroids, meteorites, meteors, interplanetary dust; formation and development of the solar system. Radiation in astrophysics. Boltzman's equation, Sah's equation. Magnitudes of stars, Pogson's equation, temperature of stars, spectral classification, Herzsprung-Rusell diagram. Binary stars, determination of the mass of stars, rotation of stars, magnetic fields of stars. The relationship between mass and luminosity, determining the dimensions of stars. Variable stars. Interstellar matter - gas, dust, molecules. Galaxy and galaxy.	
Recommended literature: An introduction to the Sun and Stars / S. Jocelyn Bell Burnell ... [et al.]. Cambridge: Cambridge University Press, 2004 An introduction to the solar system / Philip A. Bland ... [et al.]. Cambridge: Open university, 2004	

Fundamentals of Astronomy and Astrophysics / Vladimír Vanýsek. Prague: Academia, 1980 Solar System Physics / M.Brož, M. Šolc. Matfyzpress, 2013					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 51					
A	B	C	D	E	FX
52,94	13,73	17,65	5,88	7,84	1,96
Lecturers: doc. RNDr. Juraj Tóth, PhD., RNDr. Roman Nagy, PhD., doc. RNDr. Leonard Kornoš, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/1-FYZ-910/15		Course title: BSc Project (1)			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: Evaluation of individual stages in the preparation of the bachelor's thesis Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Elaboration of bachelor thesis					
Class syllabus: Individually according to the assignment of the supervisor.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 167					
A	B	C	D	E	FX
91,62	4,19	0,0	0,6	3,59	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 09.03.2022					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFL.KJFB/1-FYZ-991/15	Course title: BSc Project (2)
Number of credits: 8	
Educational level: I.	
Course requirements: Continuous assessment: According to the progress of the bachelor thesis project based on the assessment of the supervisor. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Elaboration of bachelor thesis and its defense.	
Class syllabus: According to the assignment of the bachelor's thesis and the instructions of the supervisor	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 09.03.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI-PriF.KBCh/1-KXX-004/20	Course title: Basic Chemical Calculation
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: Two written test with 30 and 70 points during the semester. A: 90%, B: 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Overview of high school curriculum: types of chemical formulas, methods of expressing the amount of chemical substances, composition of solutions, definition and determination of oxidation number and its use in nomenclature and redox reactions. Learn to write non-redox and redox chemical reactions. Mastering stoichiometric calculations.	
Class syllabus: Basic quantities used in chemical calculations: amount of substance, volume, mass, the number of particles. The relationship between the amount of substance and the volume of an ideal gas. Quantities expressing the composition of solutions. Calculations with mass fraction and mass concentration. Balance equations. Calculations with molality, volume fraction and mass concentration. Recalculations of different ways of composition of solutions. Solubility and preparation of saturated solutions. Stoichiometry of chemical compounds. Stoichiometry of chemical equations.	
Recommended literature: Silný, P. a kol.: Úlohy a modely usmerňovania úloh zo všeobecnej chémie. Expol Pedagogika, 1999. Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 2. vyd. Bratislava : UK, 2003. Ulická, E., Ulický, L.: Príklady zo všeobecnej a anorganickej chémie. ALFA, SNTL 1984. Tatiersky, J.: Základné chemické výpočty. 2. vyd. Bratislava : UK, 2013.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Nosek, DrSc., doc. RNDr. Martin Putala, CSc.					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/2-FOL-116/15	Course title: Basic Electronics
Educational activities: Type of activities: lecture / laboratory practicals Number of hours: per week: 3 / 3 per level/semester: 39 / 39 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I., II.	
Prerequisites:	
Course requirements: Continuous assessment: work on practical exercises (100%). The condition for granting credits is the presentation of a semester project. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: The student will understand the principles of using basic building blocks (resistor, inductance, capacitance, diode, transistor) in digital and analog circuits. They will understand the principles and use of basic digital and analog circuits (gates, counters, timers, operational amplifier, A / D and D / A converters, Arduino microprocessor system), principles of generating harmonic and non-harmonic signals and linear and pulse power supplies. They will be able to analyze basic circuits and use them to design simple electronic circuits with the required functionality. He will also gain practical experience with the construction and revitalization of simple electronic circuits.	
Class syllabus: Semiconductor diode and transistor and their basic connections. Transistor in switching mode, TTL digital circuits and their use. Basic logic circuits. Comparator. Timer 555. D / A and A / D converters. Arduino microprocessor system. Nodal potential method. Analysis of linear circuits in time and frequency domain. Linear model of transistor and operational amplifier. Basic circuits with operational amplifier. Positive feedback and oscillator principles. Power supplies and rectifiers.	
Recommended literature: The art of electronics / Paul Horowitz, Winfield Hill. New York : Cambridge University Press, 1989	
Languages necessary to complete the course: English	
Notes:	

Past grade distribution					
Total number of evaluated students: 101					
A	B	C	D	E	FX
95,05	0,0	3,96	0,0	0,0	0,99
Lecturers: doc. RNDr. František Kundracik, CSc., RNDr. Matej Klas, PhD., doc. RNDr. Juraj Országh, PhD.					
Last change: 27.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI-PriF.KJCh/1-KXX-014/20		Course title: Basic Laboratory Practice			
Educational activities: Type of activities: practicals Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Regular tests and written protocols. A:90%, B:80%, C:70%, D:60%, E:50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: While working in the laboratory, the student will gain basic practical experience and skills in a chemical laboratory.					
Class syllabus: Physical quantities and units. Laboratory glassware. Weighing, measuring the volume of liquid. Preparation and dilution of solutions. Quantitative analysis. Basic laboratory operations (crystallization, filtration, decantation, drying, etc.)					
Recommended literature: Nagyová I., Melichová Z., Kmeťová J.: Laboratórna technika. FPV UMB, Banská. Bystrica, 2010. Tatiersky J.: Základné chemické výpočty. UK, Bratislava, 2011. Galamboš M., Tatiersky J., Krivosudský L. a kol.: Názvoslovie anorganických látok. UK, Bratislava, 2021. Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 2. vyd. Bratislava : UK, 2003.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: doc. RNDr. Martin Putala, CSc., prof. RNDr. Jozef Nosek, DrSc., PaedDr. Anna Drozdíková, PhD.
Last change: 15.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI-PriF.KAgCh/1-KXX-005/20	Course title: Basics of Chemistry (1)
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 3 per level/semester: 26 / 39 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: Regular tests, final exam. A:90%, B:80%, C:70%, D:60%, E:50%	
Learning outcomes: The student is able to define concepts, quantities and laws in the field of chemistry, can explain the principles of chemical processes, apply knowledge in solving chemical problems related to everyday life. He/she knows the connections between the composition, structure and properties of substances.	
Class syllabus: Basic concepts and most important constants. Atomic nucleus; nuclear transformations; nuclear reactions. Electron shell of an atom; quantum numbers, orbitals, electron configuration of chemical elements. Periodic table of elements, classification of elements. Strong and weak interactions between particles, chemical bonding. Electronegativity of an atom. Oxidation number. Nomenclature. Charge number. Binding polarity. Molecule structure; localized electron pair theory. Polarity of molecules and substances. Isomerism. Group states of substances. Systems of substances - pure substance, element, compound, mixture. Solutions; composition of solutions. Chemical reactions, chemical equations. Types of chemical reactions. Thermodynamics and rate of chemical reactions, chemical equilibrium. Acids and bases, acid-base reactions, hydrolysis of salts. The concept of pH, strength and saturation of acids and bases. Redox reactions. Precipitation reactions. Complexation reactions.	
Recommended literature: Galamboš, M. a i.: Názvoslovie anorganických látok. 2. oprav. a rozš. vyd. Bratislava: Univerzita Komenského, 2011. Žúrková, Ľ. a i.: Všeobecná chémia. 1. vyd. Bratislava : SPN, 1985. Krätsmár-Šmogrovič a kol.: Všeobecná a anorganická chémia, vyd. Martin, Osveta 2007.	
Languages necessary to complete the course: Slovak, English	

Notes:					
Past grade distribution Total number of evaluated students: 3					
A	B	C	D	E	FX
33,33	0,0	0,0	0,0	0,0	66,67
Lecturers: RNDr. Jana Chrappová, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI-PriF.KAgCh/1-KXX-015/20	Course title: Basics of Chemistry (2)
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 3 per level/semester: 26 / 39 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Course requirements: Regular tests, final exam. A:90%, B:80%, C:70%, D:60%, E:50%	
Learning outcomes: The student will gain basic knowledge about common chemical elements and their compounds, will know their properties, use in everyday life and their impact on living organisms and the environment. He knows the basic division of organic substances, their properties and impact on the environment.	
Class syllabus: 1. Hydrogen, alkali metals, alkaline earth metals, water, water hardness. 2. Aluminum, carbon, silicon, nitrogen, phosphorus, greenhouse gases, glass and ceramics. 3. Oxygen, sulfur, ozone, acid rain. 4. Halogens, rare gases. 5. Chromium, manganese, iron, steel, corrosion. 6. Copper subgroup and zinc subgroup, amalgam. 7. Characteristics and distribution of organic substances 8. Bonding of atoms, chemical formulas of organic compounds, nomenclature 9. Acid-base equilibria in organic chemistry, electron effects 10. Hydrocarbons 11. Hydrocarbon derivatives (X, OH, N) 12. Hydrocarbon derivatives (C=O)	
Recommended literature: Silný P., Brestenská, B. Prehľad chémie 1, SPN, 2000. Zahradník, P., Kollárová, M. Prehľad chémie 2, SPN, 2002. Krätsmár-Šmogrovič a kol.: Všeobecná a anorganická chémia, vyd. Martin, Osveta 2007	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 1					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	100,0
Lecturers: RNDr. Jana Chrappová, PhD., Mgr. Henrieta Stankovičová, PhD.					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAG/1-KXX-007/20	Course title: Basics of Mathematics (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments. The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests. Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0). Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test).	
Learning outcomes: Students will gain the necessary skills in manipulation with numbers, mathematical expressions, elementary functions. They will expand their knowledge of geometry.	
Class syllabus: <ol style="list-style-type: none"> 1. Mathematical terminology and mathematical logic. Basics of proper mathematical expression and designation. 2. Logical formulae and proofs. Types of mathematical proofs illustrated in elementary examples. 3. Sets and number sets (basic operations with numbers and expressions, numbers, various notations, fractions). Numbers and their geometric representation on a line (absolute value and its geometric meaning). 4. Elementary number theory, divisibility, prime numbers, compound numbers. 5. Expressions, linear and quadratic expressions with variables. Properties of mathematical operations (commutation, distribution, simplification, etc.) 6. Elementary functions (polynomial, linear, quadratic, n-th power and n-th root, trigonometric, exponential, logarithmic functions, their properties and calculation). The graph of a real function and its basic properties. 	

7. Equations and inequalities of one variable (linear and quadratic, with absolute value, with n-th power and n-th root, trigonometric, exponential, logarithmic). Calculator vs. adjustment before enumeration.					
Recommended literature: Základy matematiky / Mário Boroš : Ikar, 2016 Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 18					
A	B	C	D	E	FX
0,0	27,78	22,22	0,0	5,56	44,44
Lecturers: RNDr. Martina Bátorová, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAG/1-KXX-017/20	Course title: Basics of Mathematics (2)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Course requirements: The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments. The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests. Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0). Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test).	
Learning outcomes: Students will acquire the necessary skills in mathematical operations with complex numbers, combinatorics, basics of probability and statistics, and analytical and synthetic geometry in the plane and space.	
Class syllabus: 8. Basics of calculating sequences and series (arithmetic and geometric sequence, partial sums) and their applications. 9. Linear equations and inequalities with two or three unknowns and their solutions. Equation and inequalities with parameters. 10. Elementary analytical geometry in the plane (vectors, lines, triangle, polygon, circle, conic section, scalar product) and its relationship with solutions of equations. Isometries and similarities in plane. 11. Elementary analytical geometry in space (planes, vector product). Basic bodies and their imaging. 12. Complex numbers, calculations and their geometric properties (representations, basic operations, complex n-th power and n-th root, Moivre's theorem) 13. Basic combinatorial procedures without using the traditional formulae	

14. Basic concept of probability and statistics (reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator)					
15. Limits via geometric and computational methods (basic rules of calculating limits, derivatives of elementary functions, graphs of functions and their properties)					
Recommended literature:					
Základy matematiky / Mário Boroš : Ikar, 2016					
Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia					
Languages necessary to complete the course:					
Slovak, English					
Notes:					
Past grade distribution					
Total number of evaluated students: 9					
A	B	C	D	E	FX
11,11	22,22	22,22	11,11	11,11	22,22
Lecturers: RNDr. Martina Bátorová, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/1-AIN-407/15		Course title: Brain and Mind			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1., 3., 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 154					
A	B	C	D	E	FX
48,05	18,83	15,58	8,44	2,6	6,49
Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.					
Last change: 21.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/1-FYZ-871/20	Course title: Chemical Physics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 3 per level/semester: 39 / 39 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 8.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: homework Exam: oral The evaluation of the subject takes place in the form of continuous (individual work) and final evaluation (oral exam). Successful completion of the course reflects the student's sufficient orientation in the issue. The course will be graded as provided the student demonstrates compliance with at least 51%. The conditions for successful completion of the course are in accordance with the Study Regulations of FMFI UK Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 51% Scale of assessment (preliminary/final): Weight of the intermediate / final evaluation: 30/70	
Learning outcomes: Understand the importance of quantum mechanical description of substances at the molecular level - the basis of theoretical approaches to the study of their reactions. Subject of interest - quantum mechanical description of molecules and their aggregates. To master the practical tasks of solving the electron shell of molecules using current methods of quantum chemistry.	
Class syllabus: Standard molecular Hamiltonian. Atomic system of units. Born - Oppenheimer approximation. Potential energy surface (curve). Solution of the electron Schrodinger equation MO-LCAO approximation. Electron repulsion - model of independent particles. Huckel approximation, Hartre approximation, Hartree-Fock approximation, Coulomb and exchange integral. Practical applications for solving the structure of molecules. Nuclear Schrodinger equation, its solution for diatomic molecules. Model rigid rotor-harmonic oscillator, separation of vibrational and rotational motion and processing of their interaction. Practical demonstration - calculation of spectroscopic constants of a selected diatomic molecule. Rotation of polyatomic molecules, rotational levels, rotational constants. Vibrations of polyatomic molecules - vibrational levels, normal modes. Symmetry of molecular systems. Dynamic aspects of molecular systems. Transition state methods, collision theory, quasiclassical trajectory method. Environmental influence - methods of solvation	

description. Methods considering dielectric continuum and non-methods considering discrete solvent.					
Recommended literature: Atkins P, Friedman R (2005) Molecular Quantum Mechanics Fourth Edition Szabo A, Ostlund NS Modern Quantum Chemistry					
Languages necessary to complete the course: Slovak in combination with English (study literature also in English)					
Notes:					
Past grade distribution Total number of evaluated students: 22					
A	B	C	D	E	FX
45,45	22,73	13,64	9,09	9,09	0,0
Lecturers: prof. RNDr. Ján Urban, DrSc., prof. Ing. Pavel Mach, CSc., doc. RNDr. Peter Papp, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/1-AIN-408/15		Course title: Cognitive Laboratory			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1., 3., 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 54					
A	B	C	D	E	FX
70,37	12,96	7,41	1,85	0,0	7,41
Lecturers: doc. PhDr. Ján Rybár, PhD.					
Last change: 14.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAG/1-KXX-002/20		Course title: Complementary Classes in Mathematics (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements: Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Students gain basic skill in computation with numbers, mathematical expressions, elementary functions. They extend the knowledge on elementary geometry.					
Class syllabus: 1. Basic operations with numbers and expressions (numbers, notation, fractions, linear and quadratic expressions with variables, commutativity, distributivity, simplification, etc.) 2. Relations of numbers and their geometric representation on a straight line, absolute value and its geometric significance, equations and inequalities with one variable and absolute value 3. Elementary functions (polynomials, roots, sin, cos, exp, ln) and their relations, properties and computing with them, equations and inequities, calculator vs. adjustment before enumeration. 4. Linear equations with two, three unknowns and their solution 5. Elementary analytical geometry in plane and space (vectors, straight lines, plane, triangle, circle, cone, solids) and link with the solutions of equations					
Recommended literature: Lecturer materials.					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 10					
A	B	C	D	E	FX
50,0	10,0	20,0	0,0	0,0	20,0

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., Mgr. Adriana Bosáková, Ing. Martin Čavarga
Last change: 22.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAG/1-KXX-012/20		Course title: Complementary Classes in Mathematics (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Students extends their knowledge and skills in mathematical operations with complex numbers, combinatorics, basic probability and the description of elementary functions.					
Class syllabus: 6 . complex numbers, computation and their geometric properties 7. elementary number theory, divisibility, prime numbers, graphs 8. basic combinatorial methods and solutions without the help of traditional formulas 9. basic notion of probability and statistics, reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator 10. basics of calculating sequences and series, partial sums, applications (interest, ...) 11. concept of limits geometrically and computationally, basic rules of limit calculation, derivatives of elementary functions, course of function 12. logic and the need for proof illustrated in elementary examples					
Recommended literature: Lecturers materials.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 7					
A	B	C	D	E	FX
71,43	14,29	14,29	0,0	0,0	0,0

Lecturers: Ing. Martin Čavarga
Last change: 22.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-KXX-001/20	Course title: Complementary Classes in Physics (1)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: A:90%, B:80%, C:70%, D:60%, E:50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.	
Class syllabus: Complex problems in the context of water (hydrostatic force in a liquid, Archimedes' law, continuity equation for liquids and gases, Bernoulli's equation for liquids, resistive force when moving a solid in a liquid) Complex tasks in the context of electricity and magnetism (motion of a charged particle in a homogeneous electric and in a homogeneous magnetic field, motion of a conductor in a magnetic field, motion of a magnet in a coil) Complex tasks in the context of sound (origin of sound, speed of sound propagation, equation of gradual waves, standing waves on a stretched string and on an air column, sound interference) Complex tasks in the contexts of photoelectric effect and X-rays.	
Recommended literature: Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006 Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013 Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012 Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016	

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 10

A	B	C	D	E	FX
30,0	20,0	0,0	0,0	0,0	50,0

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 15.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-KXX-011/20	Course title: Complementary Classes in Physics (2)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Course requirements: A:90%, B:80%, C:70%, D:60%, E:50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.	
Class syllabus: Complex problems in the context of translational motion of a point mass (force action, momentum, force impulse, Newton's laws of motion, elastic and inelastic collision, explosion, force action for circular motion). Complex problems in the context of a rigid body (moment of inertia, energy of a rotating body) Complex problems in the context of air (ideal gas, ideal gas phenomena, Avogadro's constant, internal energy of a body, heat capacity, energy transfer by flow, conduction and radiation, movement of a body in air). Complex problem in the context of light (beam optics, dispersion, interference and diffraction of light, black body radiation, light and energy levels of atoms) Complex problem in the context of energy conservation law. Complex problem in the context of conservation laws (energy, momentum, electric charge)	
Recommended literature: Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006 Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013 Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012	

Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016
 Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013
 Fyzika 2 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 6

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 15.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-FYZ-667/15	Course title: Computer Simulations in Physics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 3 per level/semester: 39 / 39 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: solving tasks Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: After completing the course, the student will be able to apply current methods of computer simulations to effectively solve a wide range of problems in various fields of classical physics. The student will also be able to analyze, visualize and interpret the results obtained from simulations. The focus is on molecular dynamics and Monte Carlo methods, and an important part of the course is the solution of complex optimization problems that often occur in science and in everyday life. As part of practical exercises, the student will gain experience with the application of lectured methods on clusters, crystals and fluids, including phase transitions. The student will also get acquainted with computer simulations of seismic wave fields using the finite difference method.	
Class syllabus: Use of computer simulations in physics - experiment, theory, simulations Mean values and fluctuations Ergodic theorem Molecular dynamics (MD) Classical description of interactions - force field Periodic boundary conditions, cutoff of interactions, Ewald summation for Coulomb potential MD at constant temperature and pressure, MD for molecular systems Simulation data processing - statistical error estimation Calculation of time correlation functions, connection with physical quantities MC - simple sampling, importance sampling, detailed equilibrium principle, Metropolis algorithm Optimization algorithms for complex problems - simulated annealing, evolutionary algorithms Free energy calculations, phase transitions, activated processes Quantum Simulations - Path Integral Monte Carlo Principles of finite difference method (KD), KD network, KD approximations, KD schemes, stability analysis	

KD schemes for 1D elastic problem, material interfaces, free surface, computational domain boundaries, wave field excitation					
Recommended literature: Monte Carlo simulation in statistical Physics : An introduction / Kurt Binder, Dieter W. Heermann. New York : Springer, 1992 Numerical recipes in C++ : The Art of Scientific computing / William H. Press [et al.]. Cambridge : Cambridge University Press, 2002 The finite-difference method for seismologists : An introduction / Peter Moczo [et al.]. Bratislava : Comenius University, 2004 D. Frenkel, B. Smit, Understanding molecular simulations From algorithms to applications, Academic Press 2002 electronic material http://www.fmph.uniba.sk/fileadmin/user_upload/editors/sluzby/kniznica/el_materialy/ip_uk/Introduction_to_computer_simulation_methods.pdf					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 28					
A	B	C	D	E	FX
46,43	25,0	17,86	7,14	3,57	0,0
Lecturers: prof. Ing. Roman Martoňák, DrSc., prof. RNDr. Peter Markoš, DrSc., doc. Mgr. Jozef Kristek, PhD.					
Last change: 23.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KEF/1-FYZ-211/17		Course title: Electromagnetism and Optics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 6 / 4 per level/semester: 78 / 52 Form of the course: on-site learning					
Number of credits: 11					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 245					
A	B	C	D	E	FX
20,41	11,02	17,96	19,18	22,86	8,57
Lecturers: prof. RNDr. Peter Markoš, DrSc., doc. RNDr. František Kundracik, CSc., Mgr. Róbert Astaloš, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-233/13		Course title: English Conversation Course (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests, presentations, essays Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational English as well as English for specific purposes appropriate for university students. This course is a follow up of the previously taught ESP course.					
Class syllabus: This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge.					
Recommended literature: Appropriate study material is supplied based on the participants' level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 215					
A	B	C	D	E	FX
67,44	13,02	6,51	1,86	1,4	9,77
Lecturers: Mgr. Aneta Barnes					

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-234/13		Course title: English Conversation Course (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4., 6.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests, oral presentations, essays Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational/spoken English as well as English for specific purpose appropriate for university students. This course is a follow up of the Conversational English course 1.					
Class syllabus: This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge(Upper-Intermediate/Lower Advanced).					
Recommended literature: Appropriate study material is supplied based on the participants'level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 146					
A	B	C	D	E	FX
77,4	12,33	3,42	1,37	0,0	5,48
Lecturers: Mgr. Aneta Barnes					

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJP/1-MXX-131/00	Course title: English Language (1)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades: A 93%, B 85%, C 77%, D 70%, E 65% Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0	
Learning outcomes: The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.	
Class syllabus: On entering the first semester, students' knowledge of English is tested and they are divided into groups according to the results of the placement test. In the groups of pre-intermediate and intermediate students, fundamentals of technical English are taught. Advanced students take classes of technical English for their field of study: English for mathematics, for physics, for computer science, English for management and economic and financial mathematics.	
Recommended literature: Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková. The textbook has not been published. It is at students' disposal in an electronic format.	

Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 5840					
A	B	C	D	E	FX
30,6	23,8	18,29	12,47	7,45	7,4
Lecturers: Mgr. Eva Foltánová, Mgr. Ing. Jana Kočvarová, Mgr. Ľubomíra Kožehubová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-132/00		Course title: English Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Grades: A 93%, B 85%, C 77%, D 70%, E 65% Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.					
Class syllabus: This is a continuation of the course English (1) designed for pre-intermediate students. Fundamental vocabulary is presented through selected topics in mathematics, physics and informatics. The lessons also contain revision of elementary grammar. Generally, it is a necessary preliminary to advanced programs.					
Recommended literature: Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1582					
A	B	C	D	E	FX
22,06	20,54	24,27	15,36	10,81	6,95

Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Lubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD.

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJP/1-MXX-231/00	Course title: English Language (3)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 3.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades: A 93%, B 85%, C 77%, D 70%, E 65% Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0	
Learning outcomes: The objective of the classes is to provide the students with knowledge of technical English in their field of study and experience with technical English sources sufficient to make the able to use technical language for their later study and professional purposes.	
Class syllabus: The subject continues the program of English (2). Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathematics. The subject requires advanced knowledge of general English.	
Recommended literature: Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková. The textbook has not been published. It is at students' disposal in an electronic format.	
Languages necessary to complete the course:	

Slovak, English					
Notes:					
Past grade distribution					
Total number of evaluated students: 1326					
A	B	C	D	E	FX
16,06	19,53	23,23	18,1	17,5	5,58
Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Lubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJP/1-MXX-232/10	Course title: English Language (4)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: Examination: an examination consisting of a written and an oral part. Grades: A 93%, B 85%, C 77%, D 70%, E 65% Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/skuska-z-predmetu-anglicky-jazyk-4/ Scale of assessment (preliminary/final): 0/100	
Learning outcomes: After completing the course, students will be able to work independently with professional literature in English	
Class syllabus: Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathematics.	
Recommended literature: Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová. The textbook has not been published. It is at students' disposal in an electronic format. Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková. The textbook has not been published. It is at students' disposal in an electronic format.	
Languages necessary to complete the course: Slovak, English	

Notes:					
Past grade distribution Total number of evaluated students: 3345					
A	B	C	D	E	FX
27,23	28,4	21,29	11,21	5,77	6,1
Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Lubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD.					
Last change: 17.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTF/1-FYZ-118/16		Course title: Exercises from Mechanics (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: papers Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Weight of the intermediate / final evaluation: 100/0 Scale of assessment (preliminary/final): Weight of the intermediate / final evaluation: 100/0					
Learning outcomes: Mechanics					
Class syllabus: Additional exercise for the subject Mechanics (1). We will practice more simple examples of this subject.					
Recommended literature: Physics part 1: Mechanics / D. Halliday, R. Resnick, J. Walker / VÚT in Brno, 2003 Physics I. / Dionýz Ilkovič / Bratislava, Alfa, 1972 Feynman lectures in physics 1 / R.P. Feynman, R.B. Leighton, M. Sands / Nakladatelství Fragment, 2013 Electronic texts of the presentation on the website of the subject Mechanics (1)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 180					
A	B	C	D	E	FX
35,0	22,22	15,0	12,78	6,67	8,33
Lecturers: Mgr. Peter Maták, PhD.					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTF/1-FYZ-119/16		Course title: Exercises from Mechanics (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: papers Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Weight of the intermediate / final evaluation: 100/0 Scale of assessment (preliminary/final): Continuous assessment: papersIndicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%Weight of the intermediate / final evaluation: 100/0					
Learning outcomes: Mechanics.					
Class syllabus: Additional exercise for the subject Mechanics (2). We will practice more simple examples of this subject.					
Recommended literature: Physics part 2: Mechanics / D. Halliday, R. Resnick, J. Walker / Brno University of Technology, 2003 Physics I. / Dionýz Ilkovič / Bratislava, Alfa, 1972 Feynman lectures in physics 1 / R.P. Feynman, R.B. Leighton, M. Sands / Nakladatelství Fragment, 2013 Electronic texts of the presentation on the website of the subject Mechanics (2)					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 145					
A	B	C	D	E	FX
44,14	22,76	15,17	8,28	2,76	6,9
Lecturers: Mgr. Peter Maták, PhD.					

Last change: 09.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/1-FYZ-401/15		Course title: Fields of Physical Research			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 186					
A	B	C	D	E	FX
99,46	0,54	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KJP/1-MXX-141/00		Course title: French Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: French language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of French.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 435					
A	B	C	D	E	FX
45,75	20,0	18,85	8,74	2,3	4,37
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KJP/1-MXX-142/00		Course title: French Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject continues the program of French language (1) and provides courses of essential and intermediate French language.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 265					
A	B	C	D	E	FX
38,87	25,28	19,62	10,19	2,64	3,4
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KJP/1-MXX-241/00		Course title: French Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject provides a course of intermediate French language, covering not only general, but also technical language.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 104					
A	B	C	D	E	FX
39,42	27,88	21,15	6,73	0,96	3,85
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-242/00		Course title: French Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject provides a course of intermediate French covering not only general, but also technical French language.					
Recommended literature: Menand Robert: Le Nouveau taxi 2, Hachette FLE, Paris, France 2009, ISBN 978-2-01-155551 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 74					
A	B	C	D	E	FX
41,89	32,43	17,57	2,7	1,35	4,05
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-KXX-006/20	Course title: Fundamentals of Physics (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: Learning outcomes at the level of at least 50%. Scale of assessment (preliminary/final): 60/40	
Learning outcomes: Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.	
Class syllabus: Deepening and expanding knowledge of high school curricula in the areas of: ideal gas, temperature, kinetic theory of gases; heat conduction, flow and radiation; absolute black body radiation; direct current; energy conservation law and photoelectric effect; energy conservation law and Bernoulli's equation; X-ray absorption and attenuation of light in an optical fiber; periodic phenomena and sound.	
Recommended literature: Giancoli, D., Physics: Principles with applications, 6th edition Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5., Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia Elektronick materials in moodle.uniba.sk	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 13					
A	B	C	D	E	FX
23,08	15,38	7,69	7,69	0,0	46,15
Lecturers: doc. RNDr. Peter Demkanin, PhD., PaedDr. Tünde Kiss, PhD., Mgr. Silvia Novotná					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KDMFI/1-KXX-016/20		Course title: Fundamentals of Physics (2)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Learning outcomes at the level of at least 50%. Scale of assessment (preliminary/final): 60/40					
Learning outcomes: Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.					
Class syllabus: Deepening and expanding knowledge from high school in the areas of: mechanics of a point mass; Atwood's machine; decomposition of force into components, free body diagram; movement of a point mass in a circle, centrifuge; mechanical work, mechanical energy; application of energy conservation law; the rotational effect of the force and rotation of a rigid body around a fixed axis; fluid mechanics; magnetic and electromagnetic phenomena; basics of optics.					
Recommended literature: Giancoli, D., Physics: Principles with applications, 6th edition Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5., Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia Elektronick materials in moodle.uniba.sk					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 7					
A	B	C	D	E	FX
71,43	0,0	0,0	28,57	0,0	0,0

Lecturers: doc. PaedDr. Viera Haverlíková, PhD., PaedDr. Tünde Kiss, PhD.
Last change: 15.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-FYZ-212/15	Course title: Fundamentals of Programming
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: Exam: practical (programming) Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: The student will understand the principles of computer processing of numbers and the resulting limitations (data types, including links, number fields). They will understand the basic structures of the program (functions, branches, ...) and their use to algorithmize problem solving. They will be able to program in C / C ++ language simpler algorithms for solving mathematical and physical problems (eg movement in fields, calculation of fields, sums of rows, ...).	
Class syllabus: Basic structure of C / C ++ program, data types and their accuracy, program branching (if..else, switch, for, while, do..while), functions, use of references to return multiple values of functions, two- and multidimensional fields, texts , field references, data flows and their control (cin, cout), working with files (fstream), concept of object, drawing simple graphs from C ++ program (xmgrace, GNUplot), Euler's method for solving differential equations and its use for solving motion problems , roots of functions, numerical integration and its use for solving physical problems, random numbers and Monte Carlo methods, basics of object-oriented programming.	
Recommended literature: Kundracik, F .: Basics of Programming Practically. Vydavateľstvo UK 2013. On-line: http://www.fmph.uniba.sk/index.php?id=3246 Materials on the course page: http://davinci.fmph.uniba.sk/~kundracik1/ZakladyProgramovania/	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 212					
A	B	C	D	E	FX
69,34	5,19	9,91	7,08	8,49	0,0
Lecturers: doc. RNDr. František Kunderacik, CSc., doc. RNDr. Peter Papp, PhD.					
Last change: 24.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI+KDMFI/1-KXX-008/20		Course title: Fundamentals of Programming (1)			
Educational activities: Type of activities: course Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: homework, tests Exam: solving computer tasks It is necessary to obtain at least 90% of points to obtain A rating, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E. Scale of assessment (preliminary/final): 70/30					
Learning outcomes: After completing the course, students will be able to write short, simple programs in Python and master the basic methods of debugging in their own programs.					
Class syllabus: Basic Python program structures: cycles, conditions, variables, functions, strings, files. Basic methods of finding errors in programs.					
Recommended literature: Python programming : An introduction to computer science / John M. Zelle. Sherwood, Or. : Franklin, Beedle & Associates, 2010					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 9					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Michal Winczer, PhD.					
Last change: 15.03.2022					

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI+KDMFI/1-KXX-018/20		Course title: Fundamentals of Programming (2)			
Educational activities: Type of activities: course Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: homework, written tests Exam: solving computer tasks It is necessary to obtain at least 90% of points to obtain A rating, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E. Scale of assessment (preliminary/final): 70/30					
Learning outcomes: Students will get acquainted with the basic structures for storing data in Python. Through motivational examples, they will improve in writing and debugging simple programs and get acquainted with the basic principles of computer science.					
Class syllabus: Advanced structures in Python (lists, n-tuples, matrices). Debugging programs. Motivational examples illustrating basic concepts of informatics. Examples of practical applications.					
Recommended literature: Python 3 : Výukový kurz / Mark Summerfield ; překlad Lukáš Krejčí. Brno : Computer Press, 2010 Sedem divov informatiky / Juraj Hromkovič ; preklad Michal Winczer. Ružomberok : Verbum, 2012					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 7					
A	B	C	D	E	FX
85,71	0,0	14,29	0,0	0,0	0,0

Lecturers: doc. Mgr. Tomáš Vinař, PhD., RNDr. Michal Winczer, PhD.
Last change: 15.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-151/00		Course title: German Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Class syllabus: German language is taught at three levels: beginner, intermediate and advanced. Students opt for one of them depending on whether they need to learn the fundamentals or maintain and/or improve their previous knowledge. This course's focus is to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Recommended literature: Appropriate study material is supplied by teacher based on the participants'level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 734					
A	B	C	D	E	FX
36,1	27,25	19,62	8,99	2,72	5,31
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-152/00		Course title: German Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Class syllabus: German language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of German. This course's focus is to to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Recommended literature: Appropriate study material is supplied by teacher based on the participants'level of German proficiency					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 480					
A	B	C	D	E	FX
36,04	20,21	20,83	13,13	3,33	6,46
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-251/00		Course title: German Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)					
Class syllabus: The course is a follow-up to the German language (1,2). The subject provides a course of intermediate or advanced German language. This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).					
Recommended literature: Appropriate study material is supplied by teacher based on the participants' level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 165					
A	B	C	D	E	FX
41,21	25,45	20,61	6,67	2,42	3,64
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-252/00		Course title: German Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)					
Class syllabus: The course is a follow-up to the German language (1-3). It provides a course of intermediate and advanced German language. This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).					
Recommended literature: Appropriate study material is supplied by teacher based on the participants' level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 90					
A	B	C	D	E	FX
42,22	24,44	12,22	12,22	3,33	5,56
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/1-MXX-491/15		Course title: Integrated Education of People with Disabilities			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 55					
A	B	C	D	E	FX
78,18	18,18	1,82	0,0	0,0	1,82
Lecturers: PaedDr. Elena Mendelová, CSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/1-FYZ-804/15		Course title: Introduction to Optics and Lasers			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 3 per level/semester: 39 / 39 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 5					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Pavel Veis, CSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-FYZ-451/15	Course title: Introduction to Plasma Physics and Electrical Discharges
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 8.	
Educational level: I.	
Prerequisites: FMFI.KEF/1-FYZ-211/17 - Electromagnetism and Optics or FMFI.KEF/1-TEF-204/22 - Electricity and Magnetism	
Course requirements: Continuous assessment: no Final: test, exam Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: In the course, students will gain basic knowledge of plasma physics and electrical discharges, which are necessary for successful completion of the bachelor's thesis in the area. After completing the course, students will be able to easily orient themselves in the studied issues, as they will have basic knowledge about plasma, its occurrence, generation methods, mechanisms of electric discharges, their application and plasma diagnostics. Upon successful completion of the course, students will be knowledge-ready for a possible master's degree in Plasma Physics.	
Class syllabus: <ol style="list-style-type: none"> 1. Plasma - 4th state of matter, natural occurrence of plasma, "quasineutrality" of ionized gas, methods of plasma generation (various types of electric discharges in gases), application of glow, corona and arc discharges. 2. Debye-Hückel theory of charge shielding: collective phenomena of particles, plasma polarization, shielding of el. field of inserted charge, shielded potential, Debye length, Debye sphere - ideal, non-ideal plasma. 3. Plasma charge fluctuation, quasi-neutrality of plasma, exact definition of plasma; plasma oscillations, plasma frequency. 4. Elastic and inelastic collisions of particles in plasma, mean free path of gas particles, collision frequency, effective collision cross section, reaction coefficient, elementary processes in plasma. 5. Excitation and ionization by electron-ion interaction, differential ionization, particle ionization collision cross section; radiation ionization and excitation, resonant radiation, diffusion of radiation, radiation absorption, effective photon collision cross section; thermal ionization and excitation, degree of ionization, Saha equation, binary gas, degree of excitation and Boltzmann's law. 	

6. Dissociative ionization, Townsend (first) ionization coefficient, ionization function, Wannier equation; negative ion formation, electron affinity, electronegative and electropositive gases, dissociative attachment, three-particles attachment, transient negative ion (TNI); reaction coefficient, reduced el. field.
 7. Particle recombination - spatial, on electrodes, on the wall (conductive, non-conductive); negative ion extinction; spatial recombination, recombination factor of electrons with positive ions.
 8. The movement of particles in el. field (drift), charged particle mobility, drift velocity; particle motion under the influence of concentration gradient (diffusion), Fick's law, Einstein's relation; Ambipolar diffusion.
 9. Statistical theory of el. discharges, statistical model of electron avalanches, statistical model of el. discharges.
 10. Streamer concept, Boltzman kinetic equation and Monte Carlo method.
 11. El. Discharges at high pressure, corona discharge, corona discharge in applied electrostatics, primary and secondary streamer.
 12. Dielectric barrier discharges, glow discharges at atmospheric pressure, surface activations of polymeric materials in various types of el. discharges.
 13. Spark and arc discharge, el. discharges in liquids.
 14. Plasma diagnostics, single and double probe (determination of electron concentration and temperature), optical emission spectroscopy, atomic spectra (determination of electron temperature from the ratio of intensity of spectral lines), molecular spectra (determination of rotational temperature spectra), actinometry, laser absorption spectroscopy, corpuscular spectroscopy, CRDS spectroscopy.
 15. Examples of plasma application use: in metallurgy, in surface treatment of materials, environmental protection, light sources, thermonuclear fusion.
- During the practical part of subject, computational tasks on the topic will be solved and additional (time-consuming) mathematical definitions of some physical relations and laws of lectures will be performed. Students will gain and acquire knowledge of the basics of modeling in plasma physics, and within the demonstration experiments of individual electric discharges, they will actually get acquainted with the instrumentation of laboratories. They will also get acquainted with diagnostic methods used in plasma physics - optical emission spectroscopy, probe methods, microwave methods, mass spectroscopy.

Recommended literature:

Základy fyziky plazmy : Učebný text pre magisterské štúdium / Viktor Martišovič.
 Bratislava:Univerzita Komenského, 2006
 Fundamentals of plasma physics / J. A. Bittencourt. New York: Springer, 2004
 Basic plasma physics: Selected chapters. Handbook of plasma physics. Volumes 1 and 2 /
 editors A. A. Galeev, R. N. Sudan. Amsterdam: North-Holland, 1989

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 30

A	B	C	D	E	FX
50,0	33,33	10,0	6,67	0,0	0,0

Lecturers: doc. Mgr. Dušan Kováčik, PhD., Mgr. Michal Stano, PhD., doc. RNDr. Mário Janda, PhD.

Last change: 09.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB+KEF/1-FYZ-231/15		Course title: Introduction to Quantum Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 164					
A	B	C	D	E	FX
31,71	15,85	18,9	15,24	10,98	7,32
Lecturers: prof. RNDr. Miroslav Grajcar, DrSc., prof. RNDr. Jozef Masarik, DrSc., prof. RNDr. Peter Markoš, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KEF/1-FYZ-452/18		Course title: Introduction to Solid State Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 8.					
Educational level: I., II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 22					
A	B	C	D	E	FX
50,0	4,55	18,18	13,64	9,09	4,55
Lecturers: doc. RNDr. Richard Hlubina, DrSc.					
Last change: 19.01.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KDMFI/1-AIN-112/15		Course title: Introduction to Web Technologies			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KZVI/1-AIN-610/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 2357					
A	B	C	D	E	FX
41,54	14,55	13,58	11,41	8,53	10,39
Lecturers: PaedDr. Roman Hrušecký, PhD., RNDr. Marek Nagy, PhD.					
Last change: 22.09.2017					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-KXX-003/20	Course title: Laboratory Practicals in Physics (1)
Educational activities: Type of activities: practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Course requirements: A: at least 90%, B at least 80%, C at least 70%, D at least 60%, E at least 50%. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will develop skills to empirically examine physical phenomena at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.	
Class syllabus: Measurement of physical quantities (length, mass, volume, time, temperature, force, gas pressure, electric current, electric voltage, magnetic induction, lighting, sound frequency) Physical dependence (independent and dependent variable, experiment constants), dependence graph, dependence table, mathematical description of dependence. Direct ratio and linear dependence. Linearization of nonlinear dependence by substitution and logarithmization. Random and systematic error of a series of measurements. Complete laboratory work - problem identification, formulation of hypotheses, selection of variables, design of apparatus, data collection and processing, formulation of conclusions, evaluation. Real group computer-aided laboratory experiments focused on the following areas: Hydrostatic compressive force in a liquid, Archimedes' law, Bernoulli's equation for a liquid, resistive force when moving a solid in a liquid, moving a conductor in a magnetic field, moving a magnet in a coil, sound generation, speed of sound propagation, standing waves on a stretched string and on an air column, sound interference).	
Recommended literature: Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006 Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016	

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 13

A	B	C	D	E	FX
0,0	7,69	30,77	15,38	0,0	46,15

Lecturers: doc. PaedDr. Viera Haverlíková, PhD.

Last change: 16.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-KXX-013/20	Course title: Laboratory Practicals in Physics (2)
Educational activities: Type of activities: practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Course requirements: A: 90%, B:80%, C:70%, D:60%, E:50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will develop skills to empirically examine physical phenomena at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.	
Class syllabus: Mathematical modeling of real physical situations. Comparison of data obtained by a mathematical model with data from a real experiment. Video measurement. Mathematical model and output in the form of interactive animation. Real group computer-aided laboratory experiments focused on the following areas: Newton's laws of motion, forces acting on circular motion, inertia, energy of a rotating body, ideal gas phenomena, heat capacity, radiation energy transfer, beam optics, dispersion, interference and diffraction of light, black body radiation.	
Recommended literature: Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006 Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016 Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTUM, 2013 Fyzika 2 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTUM, 2013	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 7					
A	B	C	D	E	FX
85,71	0,0	0,0	0,0	0,0	14,29
Lecturers: PaedDr. Peter Horváth, PhD.					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/1-AIN-406/15		Course title: Language and Cognition			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2., 4., 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 111					
A	B	C	D	E	FX
31,53	25,23	17,12	12,61	6,31	7,21
Lecturers: doc. PhDr. Ján Rybár, PhD.					
Last change: 12.01.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/1-AIN-500/00		Course title: Linux for Users			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes: The aim of the course is to acquire skills to work on the command line of Linux operating system. The course is designed not only for beginners.					
Class syllabus: Text console Directories and files Users, groups, redirection and searching Atributes of files and directories Text editor vim Sorting and selecting Finding Processes sed - stream editor awk bash scripts					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 1670					
A	B	C	D	E	FX
43,65	15,45	13,53	10,24	11,26	5,87
Lecturers: RNDr. Marek Nagy, PhD.					
Last change: 22.09.2017					

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1- FYZ-405/13		Course title: Mathematical Analysis (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements: Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Mastering the solution of mathematical problems.					
Class syllabus: Solving examples needed to master mathematics.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 239					
A	B	C	D	E	FX
78,66	6,69	3,35	1,67	5,86	3,77
Lecturers: RNDr. Michal Pospíšil, PhD., RNDr. František Jaroš, PhD., PaedDr. Peter Vankúš, PhD.					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1- FYZ-406/13		Course title: Mathematical Analysis (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements: Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Ability to solve mathematical problems.					
Class syllabus: Solving examples needed to master lectures in mathematics.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 154					
A	B	C	D	E	FX
66,23	11,69	2,6	5,84	9,09	4,55
Lecturers: RNDr. Michal Pospíšil, PhD., Mgr. Zuzana Šinská					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1-FYZ-407/13		Course title: Mathematical Analysis (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements: Active participation in the subject. Evaluation: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0). Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Ability to solve mathematical problems.					
Class syllabus: Solving examples needed to master lectures in mathematics.					
Recommended literature: B.P. Demidovic, Zbierka uloh z matematickej analyzy.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 187					
A	B	C	D	E	FX
89,3	0,53	2,14	0,0	1,07	6,95
Lecturers: RNDr. Michal Demetrian, PhD., RNDr. Michal Pospíšil, PhD.					
Last change: 16.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1- FYZ-408/13		Course title: Mathematical Analysis (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements: Active participation in the subject Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Ability to solve mathematical problems.					
Class syllabus: Solving examples needed to master lectures in mathematics.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 174					
A	B	C	D	E	FX
71,26	4,6	6,32	6,9	2,87	8,05
Lecturers: RNDr. Michal Pospíšil, PhD., Mgr. Július Pačuta, PhD.					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB+KTF/1-FYZ-116/17		Course title: Mathematical Methods in Physics (1)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KJFB/1-FYZ-116/15					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 764					
A	B	C	D	E	FX
30,24	14,53	17,41	14,14	17,02	6,68
Lecturers: RNDr. Radoslav Böhm, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB+KTF/1-FYZ-117/17		Course title: Mathematical Methods in Physics (2)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KJFB/1-FYZ-117/15					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 299					
A	B	C	D	E	FX
25,75	13,71	18,06	18,73	18,39	5,35
Lecturers: RNDr. Radoslav Böhm, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTF/1-FYZ-677/15		Course title: Mathematical Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 7.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Continuous assessment: homework Examination: two written exams during the semester Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: After completing the course, students will be able to use the material contained in the Brief syllabus.					
Class syllabus: Fundamentals of analysis on manifolds (tensor fields, Lie derivatives, Killing fields, ...) and introduction to the theory of Lie groups and Lie algebras and their representations. Group actions, homogeneous spaces.					
Recommended literature: Differential geometry and Lie groups for physicists / Marián Fecko. Cambridge : Cambridge University Press, 2006 Crampin,Pirani: Applicable differential geometry, CUP 1986					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 44					
A	B	C	D	E	FX
40,91	25,0	13,64	6,82	11,36	2,27
Lecturers: doc. RNDr. Marián Fecko, PhD.					
Last change: 11.08.2022					

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1- FYZ-120/17	Course title: Mathematics (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 5 / 3 per level/semester: 65 / 39 Form of the course: on-site learning	
Number of credits: 9	
Recommended semester: 3.	
Educational level: I.	
Prerequisites:	
Course requirements: Interim assessment: During the semester, there will be five written examinations for a total of 65 points. The student has the opportunity to obtain another 35 points for working on the exercises according to the instructions of the professional assistants who lead them. The student needs to get at least 60 points for work during the semester. Exam: The exam consists of a written and an oral part. Indicative assessment scale: A 92%, B 84%, C 76%, D 68%, E 60% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: The student will learn the basics of differential and integral calculus of functions of one real variable.	
Class syllabus: Real and complex numbers, sequences and their limits, completeness and square root of a positive real number, numerical infinite series, exponential function, functions of a real variable and their limits, continuity and properties of continuous functions, elementary functions (power function, logarithm and trigonometric functions).	
Recommended literature: Analysis 1: Forster Otto, Vieweg, Springer Spektrum, 2015 Mathematics 1: For the study of technical sciences / I. Kľuvánek ... [et al.]. Bratislava: SVTL, 1966 Exercises in Mathematical Analysis I / Zbyněk Kubáček, Ján Valášek. Bratislava: Comenius University, 2001 Collection of tasks and exercises in mathematical analysis / Boris Pavlovič Dėmidovič; translated from the Russian original by Miroslav Rozložník and Miroslav Tůma. Havlickuv Brod: Fragment, 2003	
Languages necessary to complete the course: slovenský, anglický	

Notes:					
Past grade distribution Total number of evaluated students: 265					
A	B	C	D	E	FX
12,83	6,79	13,58	11,7	34,34	20,75
Lecturers: prof. RNDr. Ján Filo, CSc., Mgr. Zuzana Šinská, RNDr. Patrik Mihala, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1- FYZ-135/17	Course title: Mathematics (2)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 5 / 3 per level/semester: 65 / 39 Form of the course: on-site learning	
Number of credits: 9	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: Interim assessment: During the semester, there will be five written examinations for a total of 65 points. The student has the opportunity to obtain another 35 points for working on the exercises according to the instructions of the professional assistants who lead them. The student needs to get at least 60 points for work during the semester. Exam: The exam consists of a written and an oral part. Indicative assessment scale: A 92%, B 84%, C 76%, D 68%, E 60% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: The student will learn the basics of differential and integral calculus of functions of one real variable in parts: infinite series and Riemann integral.	
Class syllabus: Differentiability and properties of differentiable functions, investigation of functions, numerical solution of equations, Riemannian integral, primitive function and methods of calculation of indefinite integrals, improper integrals, functional sequences and series, uniform convergence and its applications, power series, Taylor series.	
Recommended literature: Analysis I, Forster Otto, Vieweg, Springer Spectrum, 2015 Mathematics for the Study of Technical Sciences: Parts 1 and 2 / Igor Kluvánek, Ladislav Mišík, Marko Švec. Bratislava: Alfa, 1970 Exercises in Mathematical Analysis I and II / Zbyněk Kubáček, Ján Valášek. Bratislava: Comenius University, 1996 Collection of tasks and exercises in mathematical analysis / Boris Pavlovič Dėmidovič; translated from the Russian original by Miroslav Rozložník and Miroslav Tůma. Havlickuv Brod: Fragment, 2003	
Languages necessary to complete the course: Slovak, English	

Notes:					
Past grade distribution					
Total number of evaluated students: 214					
A	B	C	D	E	FX
11,68	11,21	11,68	18,69	26,64	20,09
Lecturers: prof. RNDr. Ján Filo, CSc., RNDr. Patrik Mihala, PhD., Mgr. Zuzana Šinská					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1- FYZ-215/17	Course title: Mathematics (3)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 5 / 3 per level/semester: 65 / 39 Form of the course: on-site learning	
Number of credits: 8	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment, final exam. Grades: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0). Scale of assessment (preliminary/final): 80/20: detailed 30 for exercises, 30 for homework 20 for midterm and 20 for exam	
Learning outcomes: The student will have an overview of the use of curve and area integrals, potential theory. They become actively acquainted with the methods and use of parametric integrals. He will actively control the work with Euler integrals. They will get acquainted with Fourier series and their use in solving physical problems of diffusion and potential theory.	
Class syllabus: Line integrals and potential of vector functions. Area integrals, Stokes and Gauss formulas. Parameter dependent integrals, their analytical properties. Euler integrals. Fourier series, convergence theorems, applications in linear diffusion theory. Fourier transform basic properties of Fourier transform, convergence of Fourier integral.	
Recommended literature: Kluvánek, I., Mišík, L., Švec M. : (1961) Mathematics II, SVTL Bratislava. M. Demetrian, Fourier series and Fourier integral, Bratislava, UK, 2012 Boris Pavlovič Dĕmidovič, Collection of Problems and Exercises in Mathematical Analysis, Fragment Publishing House, 2003 Eliáš, J., Horváth, J., Kajan, J. : (1972) Collection of problems in higher mathematics , IV, SNTL Bratislava.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 236					
A	B	C	D	E	FX
7,2	6,36	8,9	10,59	36,44	30,51
Lecturers: RNDr. Michal Demetrian, PhD., RNDr. Michal Pospíšil, PhD.					
Last change: 16.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFLKMANM/1- FYZ-225/15	Course title: Mathematics (4)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Recommended prerequisites: 1-FYZ-215 Mathematics (3)	
Course requirements: Evaluation during semester: 3 written tests 20 points each. Final exam: written test (40 points). Requirements for the final exam: minimum of 30 points from semestral evaluation. Final evaluation: 100 - 90 A, 89 - 80 B, 79 - 70 C, 69 - 60 D, 59 - 50 E, less than 50 FX. Scale of assessment (preliminary/final): 60/40	
Learning outcomes: The student will be familiar with the methods and applications of the theory of functions of a complex variable.	
Class syllabus: Elementary functions of a complex variable. Derivatives of a function of a complex variable. Cauchy-Riemann conditions. Conformal mappings. Curve integral. Cauchy's theorem. Cauchy integral formula. Taylor and Laurent's series. Residues. Argument principle.	
Recommended literature: Mathematics for the study of technical sciences: 2 works / I. Kľuvánek ... [et al.]. Bratislava: SVTL, 1965 Fundamentals of the theory of functions of a complex variable / Michal Demetrian. Bratislava: Comenius University, 2012	

Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 187					
A	B	C	D	E	FX
9,09	5,88	10,16	16,58	40,64	17,65
Lecturers: RNDr. Michal Demetrian, PhD., Mgr. Július Pačuta, PhD., RNDr. Michal Pospíšil, PhD.					
Last change: 17.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1-FYZ-350/15		Course title: Mathematics (5)			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements: Continuous assessment: papers Examination: written examination Scale of assessment (preliminary/final): 50/50					
Learning outcomes: The student will gain skills in solving differential equations and gain experience in working with qualitative methods in differential equations with emphasis on applications in physics.					
Class syllabus: Piccard's theorem. Integration methods for 1st order ODR. Existential theorem for linear DR. LDR solution set structure. Constant variation method. LDR solution using generalized power series. Some special LDR. Linear differential systems.					
Recommended literature: Ordinary differential equations / Michal Greguš, Marko Švec, Valter Šeda. Bratislava: Alfa, 1985 Michal Demetrian, Ordinary Differential Equations, Comenius University 2013					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 40					
A	B	C	D	E	FX
52,5	25,0	20,0	2,5	0,0	0,0
Lecturers: prof. RNDr. Milan Medved', DrSc., RNDr. František Jaroš, PhD.					
Last change: 17.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1-FYZ-370/20	Course title: Mathematics (6)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 2 per level/semester: 26 / 26 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 8.	
Educational level: I.	
Prerequisites: FMFI.KMANM/1-FYZ-120/17 - Mathematics (1) and FMFI.KMANM/1-FYZ-135/17 - Mathematics (2) and FMFI.KMANM/1-FYZ-215/17 - Mathematics (3)	
Antirequisites: FMFI.KMANM/1-FYZ-370/15	
Course requirements: Interim assessment: During the semester, there will be two written examinations for a total of 32 points. The student gets the next 18 points for working on the exercises according to the instructions of the assistant professor who leads them. Exam: The exam consists of a written and an oral part. Indicative assessment scale: A 92%, B 84%, C 76%, D 68%, E 60% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: The graduate of this course has knowledge of the classical theory of basic types of partial differential equations and is able to use them to solve specific problems of linear PDR.	
Class syllabus: 1. First order linear PDR (method of characteristics) 2. Wave equation - d'Alambert's formula, Kirchhoff's formula, Duhamel's principle 3. Heat conduction equation 4. Method of separation of variables 5. Laplace equation	
Recommended literature: Partial differential equations / Lawrence C. Evans. Providence: American Mathematical Society, 1998 Partial differential equations: An introduction / Walter A. Strauss. Hoboken: Wiley, 2008 Mathematical Physics: Basic Equations and Special Functions / Vasily Yakovlevich Arsenin; translated by Jozef Kačur. Bratislava: Alfa, 1977	
Languages necessary to complete the course: Slovak, English	

Notes:					
Past grade distribution					
Total number of evaluated students: 7					
A	B	C	D	E	FX
57,14	28,57	0,0	14,29	0,0	0,0
Lecturers: prof. RNDr. Ján Filo, CSc., RNDr. Kristína Rostás, PhD.					
Last change: 08.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB+KTF/1-FYZ-111/15	Course title: Mechanics (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 3.	
Educational level: I.	
Prerequisites:	
Course requirements: Assessment during the semester: homeworks, written tests Final exam: written test and oral exam Approximate scale of final grades: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: Elementary knowledge of physics methodology, understanding the role of equation of motions, ability to solve simple equations of motion, simple numerical methods which can be used if analytical solution is not possible, orientation in basic terminology of mechanics like mass, energy, momentum, moment of inertia, frequency etc.	
Class syllabus: Physical quantities and units Kinematics of point-like objects, velocity, acceleration Vector quantities, centripetal acceleration Motion with constant acceleration Motion in constant gravitational field, projectile motion, energy conservation law Newton laws of mechanics Law of inertial movement, inertial frame of reference, uniform straight line motion law of force, numerical solution for ballistic curve Fundamentals of physics methodology, state of a system, change of state, equation of motion Rotation, angular velocity momentum of a system of point objects, conservation law angular momentum, conservation law tensor of inertia, Newton laws for simple rotational movements static friction, dynamic friction equilibrium conditions scalar product, work of arbitrary force Newton gravitation law, gravitation potential, energy conservation Kepler laws	

Circular motion in gravitation field Harmonic oscillator Hooks law for spring Damped harmonic oscillator, resonance effect, lifetime/frequency uncertainty principle Mathematical and physical pendulum					
Recommended literature: Halliday, Resnick, Walker: Fundamentals of physics Feynman lectures on physics					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 292					
A	B	C	D	E	FX
14,73	12,33	8,9	6,51	20,21	37,33
Lecturers: doc. RNDr. Vladimír Černý, CSc., RNDr. Radoslav Böhm, PhD., Mgr. Peter Maták, PhD., doc. RNDr. Martin Mojžiš, PhD.					
Last change: 11.04.2017					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB+KTF/1-FYZ-112/15	Course title: Mechanics (2)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: Priebežné hodnotenie: domáce úlohy, písomka Skúška: písomná a ústna Orientačná stupnica hodnotenia: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 40/60	
Learning outcomes: Ability to work with physical systems with an infinite number of degrees of freedom, to understand the solution of a partial differential equation as an equation of motion, knowledge of basic concepts of hydromechanics, knowledge of basic concepts of molecular mechanics and thermodynamics, knowledge of thermodynamics applications in ideal classical gas, basic probability theory mathematical statistics in physics, understanding the basics of the theory of relativity	
Class syllabus: Elements of elasticity theory on the example of prism deformations, pressure and shear stress, Young's modulus. Movement of coupled oscillators. Chain of bound oscillators, continuous limit. Wave equation and its solution, normal modes, Fourier decomposition. Elastic waves in the continuum, sound, Doppler principle Fluids, Pascal's law Archimedes' law, Statics of fluids Ideal fluid motion, Continuity equation, Bernoulli's equation Calorimetry of incompressible fluid, the problem of what heat is. Basic phenomenology of capillary and osmotic phenomena History of the discovery of molecules by chemists. Mol, Avogadro's constant, typical dimensions of the microworld Phenomenology of gas processes, equation of state, Kelvin scale Kinetic theory of gas pressure, energy temperature relation	

Macroscopic work of gas, heat as microscopic work, first law of thermodynamic Mayer's relation, Adiabatic process Data processing elements, arithmetic mean error Data fitting, minimizing sum of squares, (chi-square distribution?). Drunken sailor, related to fluctuations Maxwell's velocity distribution Boltzmann distribution and barometric formula Elements of relativity theory					
Recommended literature: Physics part 1. Mechanics: University textbook of general physics / David Halliday, Robert Resnick, Jearl Walker; translated by Jana Musilová ... [et al.]. Brno: VUTIUM Technical University, 2000 Physics part 2. Mechanics - thermodynamics: University textbook of general physics / David Halliday, Robert Resnick, Jearl Walker; translated by Jan Obdržálek ... [et al.]. Brno: VUTIUM Technical University, 2000 General physics: 1: mechanics and molecular physics / Štefan Veis, Ján Maďar, Viktor Martišovič. Bratislava: Alfa, 1978 Physics for students at technical universities: 1: mechanics, acoustics, thermals / Dionýz Ilkovič. Bratislava: Alfa, 1972 Electronic texts and presentations on the subject's website					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 192					
A	B	C	D	E	FX
32,29	21,35	17,19	7,81	13,54	7,81
Lecturers: doc. RNDr. Vladimír Černý, CSc., RNDr. Radoslav Böhm, PhD., doc. RNDr. Martin Mojžiš, PhD.					
Last change: 18.05.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFLKTF/1-FYZ-413/15	Course title: Methods of Solving Physics Problems (1)
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Course requirements: Work during semester: homework and problem solution in the class. Weight of the exam: 0%. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will learn how to approach problems without any context of a given topic in the particular class. They will refresh the basic ideas and approaches from the first three semesters of the program, which are common across the areas of physics, and will learn several new ones.	
Class syllabus: The course is aimed at solving physics problems of various topics and difficulty. Sometimes those are problems that illustrate a specific approach to a class of physics problems, sometimes they are more aimed at recalling basics procedures in some area of physics. The main difference from the standard exercise sessions is that the problems come without any context of a particular subject and topics, thus the best approach to solving the problem is not given. In the first installment of this class we look at topics from the first three semesters.	
Recommended literature: Feynmanovy přednášky z fyziky s řešenými příklady 1/3 / Richard P. Feynman, Robert B. Leighton, Matthew Sands. Havlíčkův Brod : Fragment, 2001 Feynmanovy přednášky z fyziky s řešenými příklady : 2/3 / Richard P. Feynman, Robert B. Leighton, Matthew Sands. Havlíčkův Brod : Fragment, 2006 Úlohy predchádzajúcich ročníkov fyzikálnych súťaží.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 71					
A	B	C	D	E	FX
98,59	0,0	1,41	0,0	0,0	0,0
Lecturers: Mgr. Juraj Tekel, PhD.					
Last change: 18.05.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTF/1-FYZ-414/15		Course title: Methods of Solving Physics Problems (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements: Work during semester: homework and problem solution in the class Weight of the exam: 0%. Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Students will learn how to approach problems without any context of a given topic in the particular class. They will refresh the basic ideas and approaches from the fourth and partly fifth semesters of the program, which are common across the areas of physics, and will learn several new ones.					
Class syllabus: Similar to the first installment of the class, but with emphasis on more complicated topics from the first three semesters of the program, topics from the fourth semester and in the later stages also from the fifth semester.					
Recommended literature: Feynmanovy přednášky z fyziky s řešenými příklady 1/3 / Richard P. Feynman, Robert B. Leighton, Matthew Sands. Havlíčkův Brod : Fragment, 2001 Feynmanovy přednášky z fyziky s řešenými příklady : 2/3 / Richard P. Feynman, Robert B. Leighton, Matthew Sands. Havlíčkův Brod : Fragment, 2006 Problems from various physics exams and competitions.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 21					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Juraj Tekel, PhD.					

Last change: 18.05.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/1-FYZ-601/15	Course title: Nuclear Physics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Course requirements: Evaluation during the semester: midterm test Final evaluation: oral exam Scale for final grades: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: The student gains the basic understanding of the nuclear and particle physics, for example, basic properties of atomic nuclei, their radioactive decay, nuclear reactions and basic properties of elementary particles.	
Class syllabus: Properties of atomic nuclei. Basic nuclear models, the binding energy of atomic nuclei. Stability and decay of radioactive nuclei. Radioactive decay law. Alpha and beta decay. Nuclear fission. Interaction of charged particles and their detection. Radioactivity in nature. Basic nuclear reactions. Production of unstable radioactive isotopes and their separation. Particle accelerator. Elementary particles (leptons, quarks, interactions, unification theory). Quark model, QCD. Basic astrophysical reactions. Nuclear fusion.	
Recommended literature: Introductory nuclear physics / Kenneth S. Krane. Hoboken : Wiley, 1988 Introductory nuclear physics / P. E. Hodgson, E. Gadioli, E. Gadioli Erba. Oxford : Oxford University Press, 1997 Nuclear and particle physics / B. R. Martin. Chichester : John Wiley , 2006	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 41					
A	B	C	D	E	FX
53,66	14,63	12,2	9,76	4,88	4,88
Lecturers: doc. Mgr. Stanislav Antalic, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-110/00		Course title: Physical Education and Sport (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 0					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Orientation in the history of the selected sports discipline, mastering the basic principles of compensation of mostly mental burdens of the individual. Creating a positive, lasting relationship to physical education and sports in the sense of calocagation. Mastering the demands for the development of motor abilities, skills, proper technique of performing individual movements in individual sports, individual game activities in collective sports games.					
Class syllabus: Introduction to the basic history of the selected sport, with the basic principles of compensation of one-sided psychological burden of the individual's body. Development of basic motor skills with a stop to all kinds of endurance, coordination, increasing the level of joint mobility. Training of individual game activities in collective sports games. In individual sports disciplines, practice of basic techniques of individual elements.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 5698					
A	B	C	D	E	FX
95,35	1,7	0,12	0,0	0,07	2,76
Lecturers: Mgr. Ladislav Mókus, PaedDr. Dana Mašlejová, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					

Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-120/00		Course title: Physical Education and Sport (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 0					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Practising offensive and defensive combinations and game at modified rules in collective games such as basketball, volleyball, soccer, floorball. Command of elements of higher difficulty in terms of the level of the activity abilities (crawl stroke, breast stroke, butterfly stroke, trampoline jump, aerobic compositions with steps, fitball, elastic gums, paddling on the running water.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 4814					
A	B	C	D	E	FX
96,72	1,62	0,1	0,06	0,04	1,45
Lecturers: Mgr. Tomáš Kuchár, PhD., PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-210/00		Course title: Physical Education and Sport (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: To practise game combinations, tactical - mechanical elements in basketball, volleyball, soccer, floorball, ice hockey, badminton, competition rules in the sports specialization.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 2799					
A	B	C	D	E	FX
98,54	0,5	0,11	0,04	0,0	0,82
Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 16.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KTV/1-MXX-220/00		Course title: Physical Education and Sport (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Preparation for sport championships of the Faculty in the chosen sport at modified rules. The selection of talented students into the teams of the University and Faculty leagues and other faculty sport events.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 2518					
A	B	C	D	E	FX
98,53	0,16	0,08	0,04	0,0	1,19
Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-310/00		Course title: Physical Education and Sport (5)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Preparation and participation of individuals and teams in the system of university sport competitions and sport events.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1864					
A	B	C	D	E	FX
98,98	0,38	0,11	0,0	0,0	0,54
Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-320/00		Course title: Physical Education and Sport (6)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Using the communication in the physical education and sport and organizing the sport championships to achieve expressive motion of the sport and health in a valuable orientation the students.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 1630					
A	B	C	D	E	FX
98,71	0,37	0,12	0,0	0,0	0,8
Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 02.06.2015					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/1-FYZ-951/15	Course title: Physics
Number of credits: 4	
Educational level: I.	
Course requirements: Exam: State exam Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: Passing the state exam	
Class syllabus: State exam consisting of two blocks: 1. Block of classical physics (mechanics, electromagnetism, optics) 2. Block of quantum physics (quantum theory, statistical physics of thermodynamics) A detailed syllabus is on the faculty website.	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 18.05.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAFZM/1-FYZ-477/19	Course title: Physics of the Planet Earth
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Antirequisites: FMFI.KAFZM+KAMŠ/1-FYZ-476/15	
Course requirements: Continuous assessment based on discussions. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will gain basic knowledge about the structure and physical processes in the Earth and the surrounding space. The explanation of these processes will be based on the knowledge gained in basic physics courses (mechanics, electricity and magnetism, electromagnetic field theory, thermodynamics).	
Class syllabus: <ol style="list-style-type: none"> 1. How the Earth originated and what is its internal structure. 2. Tides and dynamics of Earth-Moon coexistence. 3. Seismic waves and the most precise physical model of the Earth. 4. Why has the Earth its magnetic field? What will be the magnetic field in future like? 5. Electric currents in the Earth and its surroundings. Electromagnetic sounding of the Earth. 6. Measurements of physical parameters - from archeologic findings to the deep Earth's interior. 7. Excursion 8. Earthquakes, tsunami and seismic hazard. 9. Earthquakes induced by human activity and the increase of seismic hazard. 10. Aurora, ionosphere and magnetosphere of the Earth and planets. 11. Electromagnetic rezonances in the Earth's atmosphere. 12. Sources of heat and heat flux in the Earth. Is the Earth going to overheat or is it growing cold? 	
Recommended literature: Lectures.	
Languages necessary to complete the course: Slovak	
Notes:	

Past grade distribution					
Total number of evaluated students: 11					
A	B	C	D	E	FX
54,55	9,09	9,09	18,18	0,0	9,09
Lecturers: prof. RNDr. Peter Moczo, DrSc., RNDr. Adriena Ondrášková, PhD., doc. RNDr. Sebastián Ševčík, CSc., doc. Mgr. Jozef Kristek, PhD.					
Last change: 08.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-OZE-211/15	Course title: Practical I
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: preparation for the practice, writing of reports from individual tasks Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Improvement and use of theoretical knowledge of mechanics and molecular physics, mastering basic physical measurement methods. The student will master the basic habits of independent scientific work in physics research: working with literature, laboratory protocol, obtaining experimental erudition, critical evaluation of measurement and physical interpretation of processed results, written processing of individual physical problems in the form of a paper.	
Class syllabus: In practice, students will gain skills in experimental verification of basic physics laws (Gravitational Law, Hooke's Law, Ideal Gas Law,...), quantitative investigation of physical events (state changes, oscillations, polytropic process,...) and measurement of some basic physical quantities (modulus of elasticity, density, viscosity, speed of sound, humidity, surface tension, gravitational constant, gravitational acceleration,...). Tasks: Density measurement. Measurement of modulus of elasticity. Vibrations of coupled pendulums. Measurement of gravity acceleration. Moment of inertia measurement. Gravitational constant measurement. Heat capacity measurement. Evaporation heat measurement. Determination of dynamic viscosity of fluids. Measurement of dynamic viscosity of liquids by commercial viscometers. The fall of a sphere in a confined gaseous environment. Polytropic process. Determination of surface tension of liquids. Measurement of relative and absolute humidity. Measuring the speed of sound in air. Basic properties of oscillating motion. Some tasks are equipped with sensors allowing measurement and processing of data by computers. For some tasks, conventional measuring instruments and aids are used.	
Recommended literature:	
Languages necessary to complete the course: english	

Notes:					
Past grade distribution					
Total number of evaluated students: 188					
A	B	C	D	E	FX
61,7	18,62	13,83	2,66	1,06	2,13
Lecturers: doc. RNDr. Juraj Országh, PhD., doc. RNDr. Anna Zahoranová, PhD., doc. Mgr. Dušan Kováčik, PhD., doc. RNDr. Veronika Medvecká, PhD.					
Last change: 01.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KEF/1-OZE-212/15		Course title: Practical II			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 220					
A	B	C	D	E	FX
45,0	33,64	15,45	1,82	0,91	3,18
Lecturers: doc. RNDr. Tomáš Roch, Dr. techn., RNDr. Ján Greguš, PhD.					
Last change: 01.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB+KEF/1- OZE-311/15	Course title: Practical III
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: protocols from completed exercises Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: By completing the course, students will gain experimental skills with the used instrumentation. They will make sure of the agreement between experiments and theories that clarify them in the realized experiments.	
Class syllabus: Subjective photometry and light detection, lens imaging, dispersion, properties of optical prism spectrograph, interference, two-beam light interference - Newtonian rings, polarization, sucrose optical activity, refractive index, abbe refractive index measurement by refractometer, light absorption examination, diffraction, Fresnel diffraction of light, Fraunhofer diffraction of light on a slit. Experiments in atomic physics (Franck - Hertz experiment, validation of Stefan-Boltzmann's law, range of alpha particles from Am241 in air), nuclear physics (statistical nature of nuclear processes, determination of gamma ray energy, verification of Compton scattering), applied nuclear physics (measurement of air radioactivity).	
Recommended literature: Fyzikálne praktikum IV : Atómová fyzika a detekcia ionizujúceho žiarenia / Matej Florek ... [et al.]. Bratislava : Univerzita Komenského, 1988 Instructions can be found here http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm Fyzikálne praktikum III : Optika / Zuzana Chorvátová ...[et al.]. Bratislava : Univerzita Komenského, 1984	
Languages necessary to complete the course: english	
Notes:	

Past grade distribution					
Total number of evaluated students: 52					
A	B	C	D	E	FX
65,38	19,23	7,69	0,0	0,0	7,69
Lecturers: doc. RNDr. Ivan Sýkora, PhD., RNDr. Ján Greguš, PhD., RNDr. Miroslav Ješkovský, PhD.					
Last change: 01.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-FYZ-805/15	Course title: Quantum Optics, Nanoelectronics and Informatics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 8.	
Educational level: I.	
Prerequisites: FMFI.KTF/1-FYZ-310/15 - Quantum Theory (1)	
Course requirements: Continuous assessment: homework Examination: written, oral Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: After completing the course, students will be able to understand the formalism used in quantum optics, electronics and computer science and should be able to "read" scientific articles in this modern field of physics. They will be able to solve simpler tasks and problems on their own.	
Class syllabus: 1.1 Quantization of a linear LC oscillator 1.2 Quantization of the EM field 1.3 Thermal and vacuum fluctuations 1.4 Quantum phase 2.1 Own states of the annihilation operator 2.2 Wave packages and their time evolution 2.3 Generation of coherent states 2.4 Images of optical states in phase space 3.1 Interaction of a classical EM field with a bilayer atom 3.2 Analogy of spin and bilayer atom response to external field 3.3 Two-level system as a quantum bit 4.1 Interaction of quantum EM field with two-level systems 4.2 Jaynes-Cummings model 4.3 Veiled states 5.1 Beamsplitter (Semi-transparent mirror) 5.2 Interferometers and single photon experiments 5.3 Measurement without interaction (non-destructive bomb testing) 6.1 Classical coherence 6.2 Quantum coherence	

7.1 Lindblad model of a damped quantum oscillator 7.2 Lindblad's equation and superoperator 7.3 Bloch equations 8.1. Interaction of Rydberg atoms with a resonator 8.2 Ions in traps as ultra-precise atomic clocks 8.3. Quantum on-chip electrodynamics - quantum nanoelectronics. 9.1 Compressed states 9.2 Parametric amplifier and generation of compressed states 9.3 Laser 10.1 Quantum measurements of one quantum object 10.2 Weak and strong quantum measurements 10.3 Quantum non-demolition measurements 11.1 Quantum gates 11.2 Quantum error correction 11.3 Quantum teleportation 11.4 Quantum cryptography					
Recommended literature: Quantum optics of small structures: Proceedings of the colloquium, Amsterdam, 23-24 September 1999 / Edited by Daan Lenstra, Taco D. Visser and K. A. H. van Leeuwen. Amsterdam: Academie van Wetenschappen verhandlungen, 2000 Ch. C. Gerry, P.L.Knight, Introductory Quantum Optics, Cambridge University Press, 2005 Own electronic texts of the subject published through the subject's website.					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 2					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Miroslav Grajcar, DrSc.					
Last change: 09.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFLKTF/1-FYZ-310/15	Course title: Quantum Theory (1)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 7.	
Educational level: I.	
Prerequisites:	
Recommended prerequisites: 1-FYZ-231/22 Úvod do modernej fyziky (Introduction to Modern Physics Course)	
Course requirements: Grades obtained during the semester are based on solutions to 10 or 11 homework problem sets and midterm exam Final Exam: written exam Marks: A 70%+ max grade, B 60%+ max grade, C 50%+ max grade, D 40%+ max grade, E 33% + max grade Scale of assessment (preliminary/final): 40/60	
Learning outcomes: Learning the basic ideas of quantum mechanics and limitations of macroscopic classical physics. Acquiring knowledge of elementary mathematical formalism and problem solving skills. Developing physics thinking required to control quantum systems.	
Class syllabus: Introduction: from the "one meter" dimension to the dimension of atoms. Atomic nuclei, nucleons and quarks. Standard Model of elementary particles. Uncertainty principle. Stability of atoms and origin of their typical size and typical binding energy. Typical size and typical binding energy of the atomic nucleus. Basic concepts of elementary quantum mechanics: wave function and operators. Wave function and mathematical description of a double-slit experiment with electrons. The principle of superposition. Measurement in quantum mechanics. Particle in an infinite well. Physical significance and properties of the wave function. Free particle. Wave packets based on the principle of superposition to describe a free particle. Time-dependent and time-independent Schrodinger equations. Stationary states. Linear and Hermitian operators acting on the space of wave functions. Properties of Hermitian operators. Operators corresponding to simple	

<p>physical quantities known from classical physics. Commutator and its significance. Derivation of the uncertainty principle. Time evolution of the general wave function and time evolution of the mean values of physical quantities. Exact derivation of bound state solutions of simple quantum systems and their properties. The final potential well and its graphical solution. A simple harmonic oscillator and ladder operators (i) in the representation of wave functions, (ii) in the general Dirac bra / ket formalism, (iii) in the energy representation. Angular momentum: eigenvalues and eigenfunctions. Properties of spherical harmonics. Derivation of the exact solution for a hydrogen atom (Coulomb potential) and properties of the wave functions of the ground state and lowest excited states. Spin. Stern-Gerlach experiment. Orbital vs. spin angular momentum of the electron. Spin description formalism: spinors and 2x2 Hermitian matrices corresponding to the spin projection operators on the x, y, z axes and on the axis given by a general unit vector. Pauli matrices and their properties, their eigenvalues and eigenvectors. Spin precession in an external homogeneous magnetic field. Time-independent perturbation theory for non-degenerate states as an example of an approximate method for solving the time-independent Schrodinger equation. Usefulness of the method and convergence criteria. Derivation and properties of the solution in the first-order perturbation theory. Motivation for the second order. Energy levels in the second-order perturbation theory - derivation and examples.</p>																	
<p>Recommended literature: Úvod do kvantovej mechaniky / Ján Pišút, Ladislav Gomolčák, Vladimír Černý. Bratislava : Alfa, 1983 Zbierka úloh z kvantovej mechaniky / Ján Pišút, Vladimír Černý, Peter Prešnajder. Bratislava : Alfa, 1985 (No English translations exist.) D.J.Griffiths: Introduction to Quantum Mechanics, 2ed, Pearson Education Inc, 2005</p>																	
<p>Languages necessary to complete the course: Slovak, English</p>																	
<p>Notes:</p>																	
<p>Past grade distribution Total number of evaluated students: 222</p> <table border="1"> <thead> <tr> <th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>FX</th></tr> </thead> <tbody> <tr> <td>19,37</td><td>8,56</td><td>13,06</td><td>21,62</td><td>26,13</td><td>11,26</td></tr> </tbody> </table>						A	B	C	D	E	FX	19,37	8,56	13,06	21,62	26,13	11,26
A	B	C	D	E	FX												
19,37	8,56	13,06	21,62	26,13	11,26												
<p>Lecturers: doc. RNDr. Tomáš Blažek, PhD.</p>																	
<p>Last change: 10.03.2022</p>																	
<p>Approved by:</p>																	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFLKTF/1-FYZ-365/15	Course title: Quantum Theory (2)
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 8.	
Educational level: I.	
Prerequisites:	
Recommended prerequisites: 1-FYZ-310 Kvantová teória (1)	
Course requirements: Continuous assesment: homework problem sets, exam Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Learning the basic ideas of quantum mechanics and limitations of macroscopic classical physics. Acquiring knowledge of elementary mathematical formalism and problem solving skills. Developing physics thinking required to control quantum systems.	
Class syllabus: Perturbation theory for degenerate states. Applications: Stark effect and Zeeman effect for hydrogen atom. Variational method. Scattering. Born approximation. Partial waves. Optical theorem. Scattering of identical particles. Charged particle in an electromagnetic field. Gauge symmetry in quantum mechanics. Time-dependent perturbation theory. Harmonic perturbation. Fermi's golden rule. Einstein's relations for spontaneous and stimulated emission. Mathematical formalism of quantum mechanics. Pictures for time evolution of wave functions and operators. Density matrix. Rotation and angular momentum. Irreducible representations of SU (2), or rotation group SO (3).	
Recommended literature: Úvod do kvantovej mechaniky / Ján Pišút, Ladislav Gomolčák, Vladimír Černý. Bratislava : Alfa, 1983 Zbierka úloh z kvantovej mechaniky / Ján Pišút, Vladimír Černý, Peter Prešnajder. Bratislava : Alfa, 1985 D.J.Griffiths: Introduction to Quantum Mechanics, 2ed, Pearson Education Inc, 2005	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 46					
A	B	C	D	E	FX
54,35	13,04	13,04	4,35	4,35	10,87
Lecturers: doc. RNDr. Tomáš Blažek, PhD.					
Last change: 10.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-UXX-340/00		Course title: Recreation Sports in Dialy Routine of Pupils and Students			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: To optimize the daily working programme of the students, the programmes of the sport recreational activities and time-off the students. The sport and health in a value orientation of the students. Using developed elemens in an education physical activity and sport preparation. The programmes of the sport recreational activities as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 44					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Tomáš Kuchár, PhD.					
Last change: 14.01.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-161/00		Course title: Russian Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: To master the fundamentals of general Russian. The language level is A1. Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts. The subject provides a course in Russian language for beginners.					
Recommended literature: The textbook: : Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 707					
A	B	C	D	E	FX
58,56	16,55	11,03	4,38	1,84	7,64
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-162/00		Course title: Russian Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: To master the fundamentals of general Russian. Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts. The subject continues the program of Russian language (1) and provides a course of Russian for beginners.					
Recommended literature: Textbook: Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкорвайная, В.Е. Штыленко).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 421					
A	B	C	D	E	FX
65,08	15,68	8,79	3,8	0,95	5,7
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-261/00		Course title: Russian Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary. The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.					
Recommended literature: Точка Ру А2 (Ольга Долматова, Екатерина Новачац) а Short Stories in Russian (Olly Richards, Alex Rowlings)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 200					
A	B	C	D	E	FX
70,5	17,5	8,5	2,5	0,0	1,0
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-262/00		Course title: Russian Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.					
Class syllabus: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary. The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.					
Recommended literature: Точка Ру А2 (Ольга Долматова, Екатерина Новачац) а Short Stories in Russian (Olly Richards, Alex Rowlings)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 144					
A	B	C	D	E	FX
75,69	13,19	6,94	2,78	0,69	0,69
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-IKV a-192/19	Course title: Science, Technology and Humanity: Opportunities and Risks
Educational activities: Type of activities: seminar Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 2.	
Educational level: I., II.	
Prerequisites:	
Course requirements: Semestral evaluation: active participation Final evaluation: essay Weight of the final evaluation: 60% To achieve an A, 90% is needed, for B at least 80%, for C 70%, for D, 60% and for an E, at least 50% of overall assessment.	
Learning outcomes: The students will gain awareness of the contemporary and potential future challenges posed by scientific and technological innovations and their impact on human behaviour, culture and society.	
Class syllabus: Big data: privacy, politics and power, Internet of things, its usefulness and threats, Assistant AI and its place in future society, Job market and inequality, Enhancements and human rights and the right to change self and others, Initiatives for responsible research, Artificial minds, Hybridization between species and between AI and organic minds, Future of minds and trans-humanism, Artificial emotional intelligence, An after human era.	
Recommended literature: - S. Russell: Human compatible. Artificial intelligence and the problem of control. Viking, 2019. - J. Havens: Heartificial intelligence. Embracing our humanity to maximize machines. Penguin, 2016. - P. Boddington: Towards a code of ethics for artificial intelligence. Springer, 2017. - M. Shanahan: The technological singularity. MIT Press, 2015.	

- C. MacKellar, C.: Cyborg Mind: What Brain–Computer and Mind–Cyberspace Interfaces Mean for Cyberneuroethics. Berghahn Books, 2019.
- G. Bel, J. Gemmell: Total Recall, How the e-Memory Revolution will change everything. Dutton, 2009.
- S. Zuboff: The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. PublicAffairs, 2019.
- C. O'Neil: Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy. Crown Publishers, 2016.
- M. Tegmark: Life 3.0. Allen Lane, 2017.

Languages necessary to complete the course:

English

Notes:

Past grade distribution

Total number of evaluated students: 48

A	B	C	D	E	FX
56,25	18,75	6,25	6,25	6,25	6,25

Lecturers: doc. RNDr. Martin Takáč, PhD., PhDr. Ing. Tomáš Gál, PhD.

Last change: 28.02.2020

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KMANM/1-MAT-715/15		Course title: Seminar in MS-Office			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KMANM/1-MAT-715/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 143					
A	B	C	D	E	FX
57,34	15,38	6,99	6,99	4,9	8,39
Lecturers: RNDr. Peter Švaňa, CSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1-MAT-770/15	Course title: Seminar in TEX
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 1.	
Educational level: I.	
Prerequisites:	
Antirequisites: FMFI.KMANM/1-MAT-770/00	
Course requirements: Ongoing assessment: 10 individual tasks 5 points each Exam: individual work, rewriting the specified text for 50 points Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: Mastering the MikTeX or LaTeX compiler for writing professional texts. Introduction to editors for creating such texts.	
Class syllabus: <ol style="list-style-type: none"> 1. Visualization of a tex file, error messages 2. Basic structure of a tex file, commands and environments, organization of different types of documents 3. Styles and font sizes, tables writing, footnotes 4. Mathematical formulas, creating simple pictures and inserting external pictures 5. Literature writing, index creation, slides 6. Creation of special documents (presentation, letter, ...) 	
Recommended literature: Teacher's own electronic texts published through web documents.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 415					
A	B	C	D	E	FX
84,34	5,3	3,61	1,69	1,2	3,86
Lecturers: RNDr. Michal Pospíšil, PhD.					
Last change: 17.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-171/20		Course title: Slovak Language for Foreign Students (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.					
Class syllabus: The syllabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1).					
Recommended literature: Križom- Krážom Slovenčina 1, additional material to further support the covered topics.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
47,83	0,0	0,0	0,0	0,0	52,17
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-172/20		Course title: Slovak Language for Foreign Students (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.					
Class syllabus: The syllabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1) and this course is a follow up course to the Slovak language course 1.					
Recommended literature: Križom- Krážom Slovenčina 1, additional material to further support the covered topics					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 22					
A	B	C	D	E	FX
81,82	0,0	4,55	0,0	0,0	13,64
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-271/20		Course title: Slovak Language for Foreign Students (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.					
Class syllabus: The syllabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 2.					
Recommended literature: Križom-Krážom Slovenčina 2, additional material to further support the covered topics.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 8					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-272/20		Course title: Slovak Language for Foreign Students (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.					
Class syllabus: The syllabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 3.					
Recommended literature: Križom-Krážom Slovenčina 2, additional material to further support the covered topics.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 7					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/1- MAT-733/19	Course title: Software MATLAB
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 1.	
Educational level: I., II.	
Prerequisites:	
Antirequisites: FMFI.KMANM/1-MAT-731/00 and FMFI.KMANM/1-MAT-732/00	
Course requirements: Continuous assessment: activity Examination: group project, practical computer exam Scale of assessment (preliminary/final): 20/80	
Learning outcomes: Students will learn the basics of using MATLAB software. They will be able to use MATLAB to calculate some mathematical problems, read files or write to files, plot computed data, create complex functions for reuse and create a graphical user interface GUI for their programs.	
Class syllabus: Format and conversion of variables, vectors and matrices Programming environment, so-called M-file Reading from a file and plotting data Creating functions Graphical GUI environment	
Recommended literature: MATLAB - SIMULINK I / Stefan Kozak, Slavomir Kajan. Bratislava: Slovak University of Technology, 1999 Matlab / Jela Babušíková. Bratislava: FMFI UK Library and Publishing Center, 2007 Kozák Š., Kajan S., Matlab - Simulink, 1. Slovak University of Technology in Bratislava, 1999. ISBN Dušek F., MatLab and Simulink, University of Pardubice, 2000 mathworks.com/help	
Languages necessary to complete the course: slovak	
Notes:	

Past grade distribution					
Total number of evaluated students: 52					
A	B	C	D	E	FX
19,23	25,0	13,46	15,38	11,54	15,38
Lecturers: RNDr. Patrik Mihala, PhD.					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-115/15		Course title: Sports in Nature (1)			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50%. The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ does not rent ski equipment.					
Past grade distribution Total number of evaluated students: 227					
A	B	C	D	E	FX
99,56	0,0	0,44	0,0	0,0	0,0
Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD.					

Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/1-MXX-215/15		Course title: Sports in Nature (2)			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50% The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ will provide sports equipment.					
Past grade distribution Total number of evaluated students: 194					
A	B	C	D	E	FX
94,33	0,0	0,0	0,0	0,0	5,67

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD.
Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KTV/1-MXX-216/18		Course title: Sports in Nature (3)			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KTV/1-UXX-151/22					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50% The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ does not rent ski equipment.					
Past grade distribution Total number of evaluated students: 19					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD.
Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KTV/1-MXX-217/18		Course title: Sports in Nature (4)			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Antirequisites: FMFI.KTV/1-UXX-152/22					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50% The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ will provide material equipment.					
Past grade distribution Total number of evaluated students: 18					
A	B	C	D	E	FX
88,89	0,0	0,0	0,0	0,0	11,11

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD.
Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTF/1-FYZ-315/15		Course title: Statistical Physics and Thermodynamics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements: Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 20/80					
Learning outcomes: After completing the course, students will be acquainted with the basic concepts, methods and laws and the simplest applications in the field of thermodynamics and statistical physics.					
Class syllabus: Basic knowledge of molecules, random variables, kinetic theory of gases, reversible processes in an ideal gas, first and second thermodynamic laws, entropy, statistical ensembles (micro-canonical, canonical and grand-canonical), quantum ideal gases, Bose-Einstein distribution, Fermi-Dirac distribution, thermodynamic potentials, van der Waals equation, phase transitions, elementary analysis of transport phenomena, degenerate Fermi gas, black body radiation, Bose condensation, heat capacity of solids, chemical reactions.					
Recommended literature: Fundamentals of statistical and thermal physics / Federick Reif. Singapore : McGraw-Hill, [1965]					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 176					
A	B	C	D	E	FX
29,55	12,5	14,77	11,93	27,84	3,41
Lecturers: doc. RNDr. Vladimír Balek, CSc.					
Last change: 18.05.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-133/18		Course title: Supplementary English Course (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements: tests, homework Scale of assessment (preliminary/final): 100/0 credit - ongoing evaluation Minimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course. A 100-93 % B 92-85 % C 84-77 % D 76-70 % E 69-65 % Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/					
Learning outcomes:					
Class syllabus: Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.					
Recommended literature: Study materials are created by the teacher and available in electronic form. Raymond Murphy: Essential Grammar in Use, Cambridge University Press, 1998 Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 25					
A	B	C	D	E	FX
52,0	24,0	8,0	0,0	8,0	8,0
Lecturers: Mgr. Ing. Jana Kočvarová					

Last change: 17.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-134/18		Course title: Supplementary English Course (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements: tests, homework Scale of assessment (preliminary/final): 100/0 ENcredit - ongoing evaluation Minimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course. A 100-93 % B 92-85 % C 84-77 % D 76-70 % E 69-65 %Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/					
Learning outcomes:					
Class syllabus: Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.					
Recommended literature: Study materials are created by the teacher and available in electronic form. Raymond Murphy: Essential Grammar in Use, Cambridge University Press, 1998 Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 26					
A	B	C	D	E	FX
57,69	15,38	0,0	11,54	3,85	11,54
Lecturers: Mgr. Ing. Jana Kočvarová					
Last change: 17.06.2022					

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAFZM/1-FYZ-581/15		Course title: Synoptic and Dynamic Meteorology			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 7.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 15					
A	B	C	D	E	FX
40,0	20,0	13,33	13,33	13,33	0,0
Lecturers: doc. RNDr. Martin Gera, PhD., Mgr. Zuzana Surová, Mgr. Miroslav Šinger, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFLKTF/1-FYZ-251/15	Course title: Theoretical Mechanics
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning	
Number of credits: 7	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: Scale of assessment (preliminary/final): 20/80	
Learning outcomes: After completing the course, students will understand and be able to use the material listed in the Brief syllabus of the course. In this way they will be well prepared for further theoretical physics courses.	
Class syllabus: Lagrangian and Hamiltonian formalism, the least action principle, scaling and similar solutions, two-body problem and Kepler's problem, small oscillations, perturbation theory, Euler's equations for solid body rotation, stress tensor and surface forces, ideal and viscous fluid equations, Hook's law, waves in an elastic continuum and in an ideal fluid.	
Recommended literature: Theoretical mechanics / Miroslav Brdička, Arnošt Hladík. Prague: Academia, 1987 Mechanics in Physics / Jan Horský, Jan Novotný, Milan Štefaník. Prague: Academia, 2001 Fecko, M. : Extended Syllabus and Problems in Theoretical Mechanics [40 pages, available electronically J.Langer, J.Podolský: Theoretical Mechanics, electronically at http://utf.mff.cuni.cz/vyuka/OFY003/ J.Tillich, L.Richterek: Classical Mechanics, electronically at http://muj.optol.cz/richterek/lib/exe/fetch.php?media=mechanika:mechanika.pdf	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 181					
A	B	C	D	E	FX
40,88	13,26	13,81	11,05	12,71	8,29
Lecturers: doc. RNDr. Marián Fecko, PhD.					
Last change: 08.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFLKTF/1-FYZ-265/15		Course title: Theory of the Electromagnetic Field			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 4 / 2 per level/semester: 52 / 26 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 167					
A	B	C	D	E	FX
31,14	13,17	11,38	10,78	25,75	7,78
Lecturers: doc. RNDr. Martin Mojžiš, PhD.					
Last change: 02.06.2015					
Approved by:					