

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.KJFB/2-FBF-145/00		Course title: Acoustics Fundamentals			
Educational activities: Type of activities: lecture 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: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Acoustic waves propagation in solid environment. 2. Acoustic wave sound velocity propagation relation to the density and compressibility. 3. Piezoelectric phenomenon. 4. Acoustic sensors piezoelectric phenomenon utilization. Sauerbrey equation. 5. Pulse and resonance principle of ultrasound velocity and absorption measurement. 6. Ultrasound velocimetry. 7. Ultrasound velocimetry utilization for study of thermodynamic and mechanical properties of biomembranes and biopolymers. 8. Ultrasound spectroscopy. 9. Ultrasound spectroscopy utilization for study of physical properties of membranes. 10. Acoustic impedance. 11. Surface acoustic waves. 12. Acoustics utilization in biophysics and medicine.					
Recommended literature: Z. Škvor, Acoustics and Electroacoustics, Academia, Praha, 2001 (in Czech) D.S. Balantine (Ed) Acoustic Wave Sensors. Theory, design and Physico-Chemical Applications, Academic Press, San Diego, 1997. M. Thompson, D. Stone, Surface-Launched Acoustic Wave Sensors: Chemical Sensing and Thin-Film Characterization, Wiley, 1997.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 21					
A	B	C	D	E	FX
95,24	4,76	0,0	0,0	0,0	0,0
Lecturers: RNDr. Peter Rybár, 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: FMFI.KJFB/2-FBF-223/00		Course title: Application Programs in Biophysics			
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: 4					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): Introduction to the basics of numerical programming methods in biophysics, methods of control of experimental equipment, data acquisition and processing.					
Learning outcomes:					
Class syllabus: Introduction to practical and effective methods of numerical and application programming needed to solve problems related to biophysics: solving linear algebraic equations, interpolation and extrapolation, fast Fourier transform, Fourier and spectral applications, statistical description of data. Programming of A/D converters. On-line control of experimental equipment. Collection and processing of data from experimental units.					
Recommended literature: C. Hill, Learning scientific programming with Python, 2nd edition, Cambridge University Press, 2020, ISBN 9781108778039; J.M. Zelle, Python programming: An introduction to computer science. Sherwood; Franklin, Beedle & Associates, 2010, ISBN 978-1887902991. http://en.wikipedia.org/wiki/Object-oriented_programming http://www.python.org/ http://www.scipy.org/					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 36					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Peter Rybár, PhD.					

Last change: 11.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FBF-132/15		Course title: Application of the Quantum Chemistry and Molecular Dynamics Methods to Molecular Systems			
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: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBF-132/11					
Course requirements: successfull solution of at least 4 assigned problems (with possible consultation withm lector) scale: A 90%, B 80%, C 70%, D 60%, E 51% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Application of computational methods suitably complements experimental work. Students will learn to use basic programs and procedures to solve simple problems of molecular structure and reactivity by theoretical methods of quantum chemistry and chemical physics. They will also be able to understand the published results and relevance of their applications that they found in the literature.					
Class syllabus: Introduction to molecular modeling. GHEMICAL program: editing molecules, selection of methods, study of selected reactions (substitutions, dissociations). WinMOSTar system for semiempirical calculations. Use of GAMESS and GAUSSIAN programs to determine the electronic and geometric structure. Program for quasi-classical trajectories: calculation of the effective cross section of the reaction, the rate constant for the elementary reaction.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 15					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc., doc. RNDr. Peter Papp, PhD.
Last change: 18.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FBF-122/00		Course title: Atomic and Molecular Collisions			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Recommended prerequisites: collisions, basic concepts, potential energy surfaces, description of collision processes, quasi-classical theory, quantum method of description of collision processes. Individual reactions-description					
Course requirements: Interim evaluation: writing Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%					
Learning outcomes:					
Class syllabus: 1. Potential energy surfaces. 2. Crossing and avoided crossing fo surfaces. 3. LEPS surface. 4. DIM method. 5. Dynamics of collisions- Classical approach. 6. QCT method. 7. Application of the QCT methods. 8. Analysis of results. 9. Quantum mechanical formulation, dynamics of elastic collisions. 10. Inelastic collisions. 11. Reactive collisions. 12. Application of methods to atom - molecular systems.					
Recommended literature: R.D. Levine, R.B. Bernstein, Molecular Reaction Dynamics and Chemical Reactivity, Oxford University Press, Oxford, 1987 W.H. Miller (Ed.), Dynamics of Molecular Collisions, in: Modern Theoretical Chemistry, Vol 1, Vol 2, Plenum Press, 1976. S. Brandt, H.D. Dahmen, T. Stroh, Interactive Quantum Mechanics, Springer, 2003.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 21					
A	B	C	D	E	FX
85,71	4,76	9,52	0,0	0,0	0,0

Lecturers: prof. RNDr. Ján Urban, DrSc.
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.KJFB/2-FBM-124/00	Course title: Basic Applications of Optical Spectrometry
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: 4	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Course requirements: Preliminary examination: laboratory task, test Final examination: exam Indicative evaluation 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 able to apply optical spectroscopy theoretically and experimentally in research and practice, especially in the fields of biophysics, medicine and biochemistry.	
Class syllabus: Electromagnetic radiation spectrum. Energetic states (levels) of molecules. Electronic transitions in molecules. Probabilities of absorption and emission, Einstein coefficients. Transition dipole moments. Absorption of UV VIS radiation, Lambert-Bear-Bouguer law. Information contained in absorption spectra, Frank-Condon principle. Techniques of absorption spectrophotometry. Preparation of samples for optical spectrophotometry. Chromophores. Effect of internal factors on absorption spectra. Effect of external factors on absorption spectra. Absorption of linearly polarized light. Applications of absorption spectroscopy. Fundamentals of formation of excited electronic states of molecules. Information contained in fluorescence spectra. Techniques of spectrofluorimetry. Properties of electronically excited molecules. Effect of internal factors on fluorescence spectra. Stokes law, law of mirror symmetry. Quantum yield of fluorescence. Kinetics of luminiscence, lifetime of excited state. Fluorophores. Effect of external factors on fluorescence spectra. Fluorescence quenching, fluorescence anisotropy. Fluorescence probes and labels.	
Recommended literature: Kováč Š., Leško I., Spektrálne metódy v organickej chémii. Alfa, Bratislava 1980 Ferenčík M., Škárka B., a kol.: Biochemické laboratórne metódy. Alfa, Bratislava 1981 Lapčík L., Pelikán P., Čeppan M.: Fotochemické procesy. Alfa, Bratislava 1989 Prosser V. a kol.: Experimentální metody biofyziky. Academia, Praha 1989	

Laser-Tissue Interactions : Fundamentals and Applications / Markolf H. Niemz. Berlin : Springer, 2004 Spectroscopy for the biological sciences / Gordon G. Hammes. Hoboken, N.J. : Wiley, 2005 Siences / Gordon G. Hammes. Hoboken, N.J. : Wiley, 2005					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 129					
A	B	C	D	E	FX
86,05	9,3	2,33	1,55	0,78	0,0
Lecturers: prof. RNDr. Libuša Šikurová, CSc., RNDr. Marcela Morvová, 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.KJFB/2-FBM-121/00		Course title: Basics of MR Spektrometry and Tomography			
Educational activities: Type of activities: lecture 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: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: General principles of imaging in medical practice. Basic concepts and physical principles of NMR and EPR. NMR spectrum. Relaxation mechanisms. Relationship between high resolution NMR spectrum parameters and compound structure. Multi-pulse NMR spectroscopy. 2D NMR spectroscopy. Principle of NMR imaging. Image parameters and contrast. Special imaging techniques, artifacts. Hardware and specific requirements for in-vivo measurements in humans. Localized spectroscopy and spectroscopic imaging (CSI). Practical demonstration of MR imaging and localized spectroscopy.					
Recommended literature: Literatúra dostupná voľne na webe napr.: Webb, A.: CHAPTER 1: The principles of Magnetic Resonance, and Associated Hardware, in Magnetic Resonance Technology: Hardware and System Component Design, 2016, pp. 1-47. doi: 10.1039/9781782623878-00001 eISBN: 978-1-78262-387-8					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 154					
A	B	C	D	E	FX
66,23	20,13	9,74	0,65	3,25	0,0
Lecturers: Ing. Vladimír Mlynárik, DrSc.					
Last change: 18.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-202/00	Course title: Bioenergetics
Educational activities: Type of activities: lecture Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: The first and second theorems of thermodynamic and biological systems. Gibbs energy, coupling of chemical reactions. Entropy of open thermodynamic systems. Entropy and information. The meaning of biological arrangement. Biological system, cell, organelles (mitochondria). Macromolecules in bioenergetics. General principles of metabolism. Glycolysis, formation of acetylcoenzyme A, Krebs cycle, electron transport chain complexes in mitochondria and their inhibitors, the relationship between respiration and energy production. Membrane transport. Quantitative bioenergetics, driving force ratio, redox and electrochemical potential, experimental determination of mitochondrial function. Enzymes and kinetics of enzyme processes. Substrate phosphorylation. Membrane phosphorylation - chemical concept. Mitchell's chemiosmotic concept. Conformational concept of membrane phosphorylation. Photosynthesis.	
Recommended literature: Bioenergetics: its thermodynamic foundations / Lars Garby, Poul S. Larsen. Cambridge : Cambridge University Press, 1995. ISBN 10: 0521066352 Bioenergetics 4 / David G. Nicholls, Stuart J. Ferguson. London : Academic Press, 2013. ISBN: 9780123884251 Biological physics : energy, information, life / Philip Nelson ; with the assistance of Marko Radosavljevic and Sarina Bromberg. New York : W. H. Freeman, 2004. ISBN 0-7167-4372-8 Molecular Biology of the Cell / Bruce Alberts et al. W. W. Norton & Company; 6th edition, 2014. ISBN-10: 0815345240	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 47					
A	B	C	D	E	FX
82,98	10,64	4,26	0,0	2,13	0,0
Lecturers: doc. RNDr. Iveta Waczulíková, PhD., Mgr. Veronika Šubjaková, PhD.					
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.KJFB/2-FBM-131/00		Course title: Biomedical Application of Magnetic Resonance			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: i) Basic terms, specific features of NMR in biological tissues and in vivo measurements. ii) Properties of NMR signals in biological tissues. iii) Information on a living tissue obtained by NMR methods. iv) Main issues of in vivo applications and their solutions. v) Degenerative brain diseases studied by ¹ H/ ³¹ P NMRS and MRI. vi) Studies of energy processes – glucose transport and metabolism by ³¹ P/ ¹³ C/ ¹ H NMRS – Metabolic control analysis. vii) Degenerative changes in cartilage and bone. viii) Functional imaging of cerebral activity. ix) Studying cancer by ¹ H/ ³¹ P NMRS – spectra classification. x) Assessment of tissue vitality in transplantation - relaxometry, NMR spectroscopy.					
Recommended literature: J. Weis, P. Bořuta, Úvod do magnetickej rezonancie, GOEN, Bratislava, 1998. D. Gadian, Nuclear Magnetic Resonance and its Application to Living Systems, Oxford, 1996					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 75					
A	B	C	D	E	FX
92,0	6,67	1,33	0,0	0,0	0,0
Lecturers: RNDr. Marek Chmelík, 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: FMFI.KJFB/2-FBF-143/15	Course title: Biosensors and Nanotechnologies
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Recommended prerequisites: ,	
Antirequisites: FMFI.KJFB/2-FBF-143/00	
Course requirements: P: semester work and its presentation Z: test and oral examination (80/20) Grade scale: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: By completing the course, the student acquires some knowledge about nanotechnologies, principles of construction and function of biosensors and their applications in biophysics, chemical physics and biomedicine.	
Class syllabus: Definition and characteristics of the biosensor. Sensitive biological elements. Methods of immobilization of biological components on various surfaces. Nanotechnologies, methods of surface modification with nanomaterials. Electrochemical biosensors. Optical biosensors. Mass biosensors and thermal biosensors. Applications of biosensors. Methods of studying surfaces using atomic force microscopy (AFM) and atomic force spectroscopy.	
Recommended literature: Biological Imaging and Sensing / T. Furukawa (Ed.). Berlin: Springer, 2004; Chemical sensors and biosensors: Fundamentals and applications / Florinel-Gabriel Banica. Chichester: John Wiley, 2012; Introduction to biosensors: From electric circuits to immunosensors / Jeong-Yeol Yoon. New York: Springer, 2013; Surface-launched acoustic wave sensors: Chemical sensing and thin-film characterization / Michael Thompson and David C. Stone. New York: Wiley Interscience, 1997; Physicochemistry and hydrodynamics of Langmuir-Blodgett depositions: Influence of molecular level forces on the efficiency of deposition of perfectly ordered Langmuir nanofilms / M. Elena Diaz and Ramon L. Cerro. Saarbrücken : VDM Verlag Dr. Müller, 2008; Nanobiotechnology: Concepts, applications and perspectives / edited by Christof M. Niemeyer and Chad A. Mirkin. Weinheim: Wiley-VCH, 2004; The aptamer handbook: Functional	

oligonucleotides and their applications / edited by Sven Klussmann. Weinheim: Wiley-VCH, 2006.

Languages necessary to complete the course:

Notes:

Past grade distribution

Total number of evaluated students: 63

A	B	C	D	E	FX
73,02	20,63	6,35	0,0	0,0	0,0

Lecturers: prof. RNDr. Tibor Hianik, DrSc., Mgr. Veronika Šubjaková, PhD.

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.KJFB/2-FBF-224/00		Course title: Colloids and Surfactants			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 3.					
Educational level: 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: 5					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Pavol Vitovič, 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: FMFI.KJFB/2-FBF-911/15		Course title: Diploma Thesis			
Educational activities: Type of activities: independent work Number of hours: per week: 16 per level/semester: 208 Form of the course: on-site learning					
Number of credits: 10					
Recommended semester: 3.					
Educational level: 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: 11					
A	B	C	D	E	FX
81,82	18,18	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, DrSc.					
Last change:					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-991/15	Course title: Diploma Thesis Defense
Number of credits: 16	
Educational level: II.	
State exam syllabus:	
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/2-FBF-920/00		Course title: Diploma Thesis Seminar (1)			
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: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Presentation and discussion on the data obtained by study of literature regarding the given problem. Presentation and discussion of techniques and methods (experimental and theoretical) to be used in the thesis. Setting particular aims of the diploma thesis.					
Recommended literature: According to the Diploma thesis.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 25					
A	B	C	D	E	FX
96,0	0,0	0,0	0,0	0,0	4,0
Lecturers: prof. RNDr. Libuša Šikurová, 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/2-FBF-921/00		Course title: Diploma Thesis Seminar (2)			
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: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Presentation of own results achieved during the work on diploma thesis, possibility of delineation of the obtained data, statistical processing of the data. Discussion of the obtained data and its possible applications for further research or practice.					
Recommended literature: According to the Diploma thesis					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
95,65	0,0	4,35	0,0	0,0	0,0
Lecturers: prof. RNDr. Libuša Šikurová, 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.KAI/2-MXX-130/21		Course title: Elements of AI			
Educational activities: Type of activities: independent work Number of hours: per week: 25 per level/semester: 325 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Passing the online course https://course.elementsofai.com/ (in English or Slovak version).					
Learning outcomes: The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.					
Class syllabus: 1. What is artificial intelligence: related areas, AI philosophy. 2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games 3. Probability and chance, Bayes' theorem, naive Bayesian classification. 4. Machine learning: nearest neighbor classifier, regression. 5. Neural networks: basics, creation, modern techniques. 6. Consequences: on predicting the future, the effects of AI on society, summary.					
Recommended literature: Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library. Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.					
Languages necessary to complete the course: Slovak or English					
Notes: The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.					
Past grade distribution Total number of evaluated students: 37					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Mária Markošová, PhD.					

Last change: 22.08.2021
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/2-MXX-130/21		Course title: Elements of AI			
Educational activities: Type of activities: independent work Number of hours: per week: 25 per level/semester: 325 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Passing the online course https://course.elementsofai.com/ (in English or Slovak version).					
Learning outcomes: The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.					
Class syllabus: 1. What is artificial intelligence: related areas, AI philosophy. 2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games 3. Probability and chance, Bayes' theorem, naive Bayesian classification. 4. Machine learning: nearest neighbor classifier, regression. 5. Neural networks: basics, creation, modern techniques. 6. Consequences: on predicting the future, the effects of AI on society, summary.					
Recommended literature: Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library. Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.					
Languages necessary to complete the course: Slovak or English					
Notes: The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.					
Past grade distribution Total number of evaluated students: 37					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Mária Markošová, PhD.					

Last change: 22.08.2021
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: 1., 3.					
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: 2., 4.					
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:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-953/15	Course title: Experimental Methods in Biophysics and Chemical Physics
Number of credits: 3	
Educational level: II.	
State exam syllabus:	
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/2-FBF-105/00		Course title: Experimental Methods in Biophysics and Chemical Physics (1)			
Educational activities: Type of activities: lecture 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: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Light microscopy. 2. Electron microscopy. 3. X-ray crystallography for determining the structure of minerals and biopolymers. 4. Proteopathies: methods for studying and diagnosing protein conformational diseases. 5. Fundamentals of EPR. 6. Application of EPR in biophysics. 7. Fundamentals of NMR. 8. Application of NMR in biophysics. Computer tomography. Magnetic resonance imaging. 9. Bioelectrochemical methods for biomembranes. Measurement of membran conductance, patch clamp. 10. Ion selective electrodes, Biosenzors. 11. Electrophoresis. Chromatographic methods. 12. Molecular acoustics and sonography.					
Recommended literature: B. Nölting, Methods in Modern Biophysics, Springer, 2005 G.G. Hammes, Spectroscopy for Biological Sciences, Wiley, 2005 I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007 E. Hoffman, V. Stroobant , Mass Spectrometry. Principles and Applications, Wiley, 2007. N.E. Jacobsen, NMR Spectroscopy Explained ,Wiley, 2007. C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980. W. Gordy, Theory and application of Electron Spin Resonance. Wiley, New York, 1980.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 26					
A	B	C	D	E	FX
76,92	3,85	15,38	3,85	0,0	0,0

Lecturers: Mgr. Zuzana Garaiová, PhD., doc. RNDr. Pavol Vitovič, PhD., doc. RNDr. Iveta Waczulíková, PhD., RNDr. Marcela Morvová, 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: FMFI.KJFB/2-FBF-106/00	Course title: Experimental Methods in Biophysics and Chemical Physics (2)
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: 1. Non-spectral optical methods: refractometry, polarimetry, interferometry. 2. Spectral optical methods: UV-VIS. 3. Application of UV-VIS in biophysics. 4. Fluorescence spectroscopy and method of polarized fluorescence. 5. Application of fluorescence spectroscopy in biophysics. 6. Infrared spectroscopy. 7. Application of infrared spectroscopy in study of biopolymers. 8. Raman spectroscopy. 9. Methods based on light scattering: Flow cytometry, Particle size and shape analysers. 10. Laser spectroscopy. 11. Methods of molecular imaging (AFM, STM, SNOM, SECM). 12. Nanotechnology in biophysics and medicine.	
Recommended literature: B. Nölting, Methods in Modern Biophysics, Springer, 2005 G.G. Hammes, Spectroscopy fo Biological Sceinces, Wiley, 2005 I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007 C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980. E.R. Menzel, Laser Spectroscopy, Marcel Dekker, New York, 1995. D.S. Balantine (Ed) Acoustic Wave Sensors. Theory, design and Physico-Chemical Applications, Academic Press, San Diego, 1997. P.W. Atkins, J. de Paula, Physical Chemistry, Oxford University Press, New York 2002.	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 25					
A	B	C	D	E	FX
68,0	16,0	0,0	12,0	4,0	0,0
Lecturers: Mgr. Zuzana Garaiová, PhD., doc. RNDr. Pavol Vitovič, PhD., doc. RNDr. Iveta Waczulíková, PhD., RNDr. Marcela Morvová, 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: FMFI.KJFB/2-FBF-201/00		Course title: Field Practice			
Educational activities: Type of activities: practice Number of hours: per week: per level/semester: 4t Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: The student will work on the experimental or theoretical part of diploma thesis during 4 weeks in the laboratory of diploma thesis supervisor or at other laboratory recommended by diploma thesis supervisor.					
Recommended literature: According to recommendation of practice or diploma thesis supervisor					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
95,65	4,35	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, DrSc., Mgr. Veronika Šubjaková, 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: 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:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-952/15	Course title: General Biophysics and Chemical Physics
Number of credits: 3	
Educational level: II.	
State exam syllabus:	
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.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.KJFB/2-FBF-140/00		Course title: Introduction to Biomechanics			
Educational activities: Type of activities: lecture 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: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Introduction to the biomechanical concepts. 2. Biomechanics of cell membrane and form of cell. 3. Biomechanics of human tissues in organism. 4. Human locomotion – system of bone muscles. 5. Thermomechanics of muscle contraction. 6. Active motion of joints. 7. Forces on the skeleton. 8. Visco-elastic properties of body liquids. 9. Heart as a pump machine. 10. Hearing biomechanics. 11. Breathing mechanics. 12. Biomechanics of digestion tract.					
Recommended literature: J. Vogel, Biomechanics, Princeton, University Press, 2003. J. Valenta, Biomechanics, Academia and Kluwer Academic Publishers, 2002. http://en.wikipedia.org/wiki/Biomechanics					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 126					
A	B	C	D	E	FX
88,1	7,14	3,17	1,59	0,0	0,0
Lecturers: prof. RNDr. Melánia Babincová, 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.KJFB/2-FBF-150/15		Course title: Introduction to General Biology			
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: 1.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBF-150/10					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 12					
A	B	C	D	E	FX
91,67	8,33	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Melánia Babincová, 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.KJFB/2-FOL-219/15		Course title: Lasers and Optical Fibers in Medicine			
Educational activities: Type of activities: lecture Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBM-235/00					
Course requirements: Continuous assessment: test 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 work in the fields of laser spectroscopy and fiber optics and apply them in biomedicine.					
Class syllabus: Basic concepts of light. Basic properties of laser radiation: monochromaticity, coherence, polarization. Basic types of lasers. Optical properties of tissues. Thermal properties of tissues. Biophysical mechanisms of action of laser radiation. Biochemical and biological effects. Photochemical effects of lasers on tissues. Thermal effects of lasers on tissues. Non-thermal effects of lasers on tissues and nonlinear effects. Light guides. Indications and contraindications for the use of lasers in medicine.					
Recommended literature: Laser-Tissue Interactions : Fundamentals and Applications / Markolf H. Niemz. Berlin : Springer, 2004					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 4					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Libuša Šikurová, CSc., RNDr. Dušan Chorvát, PhD.
Last change: 18.02.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FBF-146/00		Course title: Liposomes in Biophysics and Medicine			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Structure and properties of lipid bilayers of liposomes. 2. Methods of liposome preparations. 3. Physical properties: ordering of lipid molecules, phase transitions, osmotic properties, permeability. 4. Stability of liposomal structure. 5. Processes of aggregation, fusion and auto-oxidation. 6. Applications in biophysics and medicine. 7. Model systems, cancer chemotherapy, antimicrobial therapy, targeted transport. 8. Methods of efficient drug encapsulation – chemistry and physics. 9. Mechanisms of cell-liposome interaction. 10. Fusion, stable adsorption, endocytosis. 11. Conditions of stability of in the blood – vascular system. 12. Novel structures in liposomal therapy: transferosomes, magnetoliposomes, fullerenosomes.					
Recommended literature: G. Betageri, Liposome Drug Delivery Systems, Technomics Press 2002. D. Lasic, Liposomes in Gene Delivery, CRC Press 1997. http://en.wikipedia.org/wiki/Liposome					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 66					
A	B	C	D	E	FX
98,48	1,52	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Melánia Babincová, 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.KJFB/2-FBF-121/00		Course title: Membrane Biophysics			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Continuous assessment: individual work Examination: oral examination Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%					
Learning outcomes: By completing the course, the student acquires a knowledge about the structure of biomembranes and their models and the physical properties of biomembranes.					
Class syllabus: 1. Development of ideas about membrane structure. Chemical composition of membranes, asymmetry and hydration of lipid bilayer. 2. Conformation of hydrocarbon chains and polar heads. X-ray analysis of membranes. 3. Lipid monolayers and their physical properties. 4. Bilayer lipid membranes (BLM) and membranes on a solid support. 5. Liposomes, application of EPR, NMR and fluorescence spectroscopy to study biomembranes. 6. Thermodynamic properties of membranes. Lipid bilayer phase transitions. 7. Mechanical properties of membranes. 8. Membrane potentials. 9. Ion channels and transporters. Volt-ampere dependences of ion channels. 10. Active ion transport. 11. Protein-lipid interactions. 12. Membrane receptors. Signal transmission inside cells.					
Recommended literature: P.F. Dillon, Biophysics: a physiological approach, Cambridge University Press, 2012;					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 50					
A	B	C	D	E	FX
64,0	32,0	4,0	0,0	0,0	0,0
Lecturers: Mgr. Zuzana Garaiová, PhD., prof. RNDr. Tibor Hianik, DrSc.					

Last change: 11.03.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: PriF-FMFI.KI/2-AIN-501/00	Course title: Methods in Bioinformatics
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: 3.	
Educational level: I., II.	
Prerequisites:	
Antirequisites: FMFI.KAI+KI/1-BIN-301/15	
Course requirements: Homework assignments (30%), group project (10%), individual project (40%), weekly quizzes (10%), activity at practicals (10%). Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will be familiar with basic problems and methods in bioinformatics; they will be able to choose an appropriate method for a given biological problem and to interpret its results.	
Class syllabus: Basic concepts from probability, algorithms and machine learning. Sequencing and assembling genomes. Gene finding. Sequence alignment. Evolutionary models and phylogenetic trees. Comparative and population genomics. RNA structure. Motif finding and gene expression analysis. Protein structure and function. Selected current topics. Life science students will focus on understanding and correct application of these methods on real data.	
Recommended literature: Biological sequence analysis : Probabilistic models of proteins and nucleic acids / Richard Durbin ... [et al.]. Cambridge : Cambridge University Press, 1998 Understanding bioinformatics / Marketa Zvelebil, Jeremy O. Baum. New York : Garland Science, 2008	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 85					
A	B	C	D	E	FX
45,88	23,53	16,47	9,41	4,71	0,0
Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Askar Gafurov, 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.KJFB/2-FBM-135/00		Course title: Methods of Biosignal Processing and Medical Imaging Computer Graphic (1)			
Educational activities: Type of activities: lecture Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Preliminary examination: practical task Final examination: test Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50					
Learning outcomes: After completing the course, students will be able to process signals from biological objects - part 1.					
Class syllabus: Image processing: physical principles of image registration, sampling, aliasing; image transformation, resampling, brightness transformations, binary operations; convolution, filtering, edge detectors, morphology and segmentation. Data visualization: display and visualization of image and multidimensional data, acquisition of basic practical skills in available visualization system.					
Recommended literature: Biological Imaging and Sensing / T. Furukawa (Ed.). Berlin : Springer, 2004 The Scientist and Engineer's Guide to Digital Signal Processing / Steven W. Smith. California Technical Pub, 1997					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 156					
A	B	C	D	E	FX
79,49	19,23	1,28	0,0	0,0	0,0
Lecturers: RNDr. Dušan Chorvát, PhD., RNDr. Milan Zvarík, 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.KJFB/2-FBM-136/00		Course title: Methods of Biosignal Processing and Medical Imaging Computer Graphic (2)			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Preliminary examination: practical task Final examination: test Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50					
Learning outcomes: After completing the course, students will be able to process signals from biological objects - part 2.					
Class syllabus: Signal processing: signal types and sources; analog signal preprocessing; signal transmission, transmission and recording; noise and signal filtering; frequency analysis; mathematical modeling and signal fitting (statistical analysis); signal compression and coding. Applications: optical microscopy, tomography, acoustics, electrophysiology.					
Recommended literature: Biological Imaging and Sensing / T. Furukawa (Ed.). Berlin : Springer, 2004 The Scientist and Engineer's Guide to Digital Signal Processing / Steven W. Smith. California Technical Pub, 1997					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 141					
A	B	C	D	E	FX
86,52	10,64	2,84	0,0	0,0	0,0
Lecturers: RNDr. Milan Zvarík, 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.KJFB/2-FBF-120/00	Course title: Molecular Biophysics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: 1. Introduction, historical overview. Structure of proteins, peptide bound, Secondary structure of proteins. 2. Conformation of polypeptide chain. 3D structure of proteins. 3. The type of interactions in macromolecules. 4. Phase transitions in biopolymers (Globule-Statistical chain). 5. Structure of nucleic acids. 6. Structure of biomembranes and their models. Electron microscopy and X-ray analysis of membranes. 7. Physical properties of the membranes. Membrane electric breakdown, electroporation. 8. Mechanisms of membrane conductivity. Membrane receptors. 9. Phase and membrane theory of excitation. Membrane potential. Improvement of the membrane theory of Bernstein. 10. Mechanisms of the origin and propagation of nervous impulse. Model of Hodgkin and Huxley. 11. Structure of the muscle and muscle proteins. Electrochemical coupling of muscle contraction. 12. The theory of muscle contraction	
Recommended literature: T. Hianik, Basics of Molecular Biophysics, UK, 1987 (in Slovak). M.B. Jackson, Molecular and Cellular Biophysics, Cambridge University Press, 2006 B. Nölting, Methods in Modern Biophysics, Springer, 2006. T. Hianik, Structure and physical properties of biomembranes and model membranes, Acta Physica Slovaca 56 (2006) 687-805. C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980. B. Alberts, D. Bray, A. Johnson, J. Lewis, M. Ralf, K. Roberts, P. Walter, Essential Cell Biology, Garland Publishing. Inc, New York, 1998.	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 146					
A	B	C	D	E	FX
47,26	30,82	13,7	7,53	0,68	0,0
Lecturers: prof. RNDr. Tibor Hianik, 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.KJFB/2-FBF-226/15	Course title: Molecular Dynamics Simulations
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: 3.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes: Familiarization of students with the basics of simulations by molecular dynamics methods. Simulate simple systems using available software.	
Class syllabus: Laboratory and computer experiment, description of system with many particles, Verlet and Gear integrator, simple thermostats and barostats, intermolecular forces, correlation functions, simulations in NpT and NVT microcanonical ensembles, border conditions, sampling and time step, comparison of forcefields, system setting for simulations, simulation convergence, trajectory analysis - visual inspection, analysis of RMSD, molecule fluctuations, radial distribution function (RDF), moment of gyration, dihedral angles, principal component analysis (PCA), estimation of interacting energies, entropies, analysis of interaction between parts of simulated system - e.g. hydrogen bonds, parametrisation of molecules, polarizable forcefields, combined quantum-classic simulations (QM/MM), simulated annealing, parallel tempering - replica exchange (REMD)	
Recommended literature: H. Gould, J. Tobochnik, W. Christian: An introduction to computer simulation methods : Applications to physical systems, San Francisco : Pearson, 2007 D. Frenkel, B. Smit: Understanding Molecular Simulation, Academic Press, 2002 Používateľský manuál a návody (tutorials) k programu GROMACS (https://www.gromacs.org) a Amber (https://www.amdbermd.org)	
Languages necessary to complete the course:	
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: RNDr. Ing. Milan Melicherčík, PhD., prof. RNDr. Ján Urban, DrSc.					
Last change: 13.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-221/00	Course title: Multiparticle Techniques in Chemical Physics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: 1. Importance of colloidal systems. Classification of colloids. 2. Structure and characterization of surfactants. 3. Solutes, solvents, organized amphiphilic structures. 4. Solute thermodynamics. Osmotic pressure. Chemical potential. Viscosity. 5. Forces in colloidal systems. Van der Waals forces. 6. Electrostatic interactions in colloidal systems. 7. Structure and properties of micelles. Critical micellar concentration. Emulsions. 8. Adsorption thermodynamics and isotherms. Physics and chemistry of interfaces and monolayers. 9. Electrical double-layer. Diffusion double layer. Debye-Hückel model. Gouy-Chapman theory. 10. Stability of colloids. 11. Phases, phase equilibrium, phase diagrams. 12. Methods for studying colloidal systems-zeta potential, electrophoresis, dynamic light scattering, contact angle, wetting.	
Recommended literature: Daoud, M., Williams, C., Lyle, S.: Soft Matter Physics, Springer, 1999. Evans, F. Wennerström, H.: The Colloidal Domains. Where Physics, Chemistry, Biology, and Technology Meet, Wiley-WHC, 1999. Hatschek, E.: An introduction to the Physics and Chemistry of Colloids, BiblioBazaar, 2008. Hiemenz, P., Rajagopalan, R.: Principles of Colloid and Surface Chemistry, Marcel Drekker, 1997. Israelachvili, J.: Intermolecular and Surface Forces: With application to Colloidal and Biological Systems (Colloid Science), Academic Press, 1992. Rosen, M.: Surfactants and Interfacial Phenomena, Wiley-Interscience, 2004. Safran, S., Safran, S.A.: Statistical Thermodynamics of Surfaces, Interfaces, and Membranes, Westview Press, 2003. Shaw, D.: Introduction to Colloid and Surface Chemistry, Butterworth-Heinemann, 1992.	
Languages necessary to complete the course:	
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: Mgr. Ivan Sukuba, 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: FMFI.KJFB/2-FBF-107/15		Course title: Organic Chemistry and Biochemistry			
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: 1.					
Educational level: I., II.					
Prerequisites:					
Recommended prerequisites: Chemical bond and its effect on the structure of organic molecules. Physical and chemical properties, reactivity of organic molecules. Structure and interactions of biomolecules. Amino acids, peptides and protein-structure, functions, interactions. Enzymes, catalysis. Nucleotides and nucleic acids. Lipids, biological membranes, membrane dynamics. Metabolism of biomolecules, principles. The exercises are based on the use of computer chemistry in solving problems related to the structure, properties, reactivity of organic molecules that are presented in lectures.					
Course requirements: Interim evaluation: test Test: test Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 30test/70expensive knowledge					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 52					
A	B	C	D	E	FX
67,31	9,62	1,92	9,62	5,77	5,77
Lecturers: prof. RNDr. Ján Urban, DrSc., doc. RNDr. Iveta Waczulíková, 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.KJFB/2-FBM-213/00	Course title: Photobiophysics and Phototherapy
Educational activities: Type of activities: lecture Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements: Preliminary examination: project Final examination: exam Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: After completing the course, students will be able to use the acquired knowledge about physico-chemical mechanisms of light interaction with biological objects in biomedical applications and research.	
Class syllabus: Subject of photobiophysics. Sunlight penetrating the Earth. Chromophores and fluorophores in biological objects. Non-physiological and physiological photobiological processes. Photoinformation processes. Photosynthesis. Bioluminescence. Principles of phototherapy and photodiagnostics.	
Recommended literature: Prosser, V. a kol.: Experimentální metody biofyziky. Academia, Praha, 1989. Lakowicz, J. R.: Principles of Fluorescence Spectroscopy, Springer, 2006. Hammes, G. G, Hoboken, N. J.: Spectroscopy for the biological sciences. Wiley, 2005. Niemz M. H., Laser-Tissue Interactions. Fundamentals and applications. Springer, Berlin, 2004. Fotakis, C., Papazoglou T. G., Kalpouzos, C.: Optics and Lasers in Biomedicine and culture. Springer, Berlin, 1998. Lowlor, D. W.: Photosynthesis. Third Edition. BIOS Scientific Publishers, Oxford, 2001. Súčasnú vedeckú časopisy.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 100					
A	B	C	D	E	FX
94,0	4,0	1,0	0,0	1,0	0,0
Lecturers: prof. RNDr. Libuša Šikurová, CSc.					
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.KJFB+KEF/2- FBF-102/00	Course title: Physical Chemistry and Electrochemistry
Educational activities: Type of activities: lecture 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., II.	
Prerequisites:	
Course requirements: Continuous assessment: homework Exam: oral The evaluation of the subject takes place in the form of continuous (individual work -20% of total score) 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 50% Scale of assessment (preliminary/final): 20/80	
Learning outcomes: The student will have developed a basic apparatus for understanding the physical nature of chemical processes, which may be encountered in other subjects (biochemistry, bioenergetics, plasma physics) as well as with the principles of some analytical methods used e.g. in biophysics.	
Class syllabus: Thermochemistry, creative, reaction and bond enthalpies, their use. Fundamentals of chemical thermodynamics, chemical potential and its application to the study of equilibrium processes. Fugacity, fugacity coefficient, activity, activity coefficient. Chemical equilibrium, equilibrium constant and its dependence on state variables. Affinity of a chemical reaction, conditions of spontaneous chemical course. reactions. Acid-base reactions and the theory of acids and bases. Galvanic cell, electrode potential, its use for measuring physico-chemical quantities. Introduction to chemical kinetics. Reaction order, methods of determining the reaction order. Reaction mechanisms and their relation to the kinetic equation. Homogeneous and heterogeneous catalysis. Autocatalysis, oscillating reactions.	
Recommended literature: http://www.chem1.com/acad/webtext/virtualtextbook.html	
Languages necessary to complete the course:	

english					
Notes:					
Past grade distribution					
Total number of evaluated students: 106					
A	B	C	D	E	FX
60,38	32,08	4,72	0,0	0,0	2,83
Lecturers: prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc., doc. RNDr. Peter Papp, PhD.					
Last change: 18.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/2-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: 2					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Practicing of the students' game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1657					
A	B	C	D	E	FX
98,37	0,6	0,06	0,0	0,0	0,97
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: 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.KTV/2-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: 2					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of areobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1557					
A	B	C	D	E	FX
98,52	0,39	0,06	0,06	0,06	0,9
Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Branislav Nedbálek, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., 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/2-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: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1281					
A	B	C	D	E	FX
98,75	0,47	0,08	0,0	0,0	0,7
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: 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.KTV/2-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: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1110					
A	B	C	D	E	FX
98,47	0,45	0,09	0,09	0,09	0,81
Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Branislav Nedbálek, Mgr. Júlia Raábová, PhD., 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: FMFI.KJFB/2-FBF-142/00		Course title: Physical Mechanisms of the Processes in Human Organism			
Educational activities: Type of activities: lecture 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: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Coordination of bone and muscular system during human locomotion. 2. Muscle work. 3. Mechanical work of human heart. 4. Flow properties of veins. 5. Blood hemodynamics. 6. Quantitative theory of human respiration system. 7. Origin of human voice. 8. Photoreception and theory of visual perception. 9. Reception of sound signal and sound analysis in the ear. 10. Helmholtz and Békésy theories of hearing. 11. Perception of mechanical stimulation and pain by neural system. 12. Mechanism of smell and taste perception.					
Recommended literature: T. Crough, Physiological Processes, Academic Press, 1999. T. C. Ruch, T. Patton, Physiology and Biophysics: Circulation, Respiration and Fluid Balance, Cambridge University Press, 2004. http://en.wikipedia.org/wiki/Human_physiology					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 13					
A	B	C	D	E	FX
92,31	7,69	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Melánia Babincová, 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.KJFB/2-FBF-222/00		Course title: Physics of Complex Systems			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Many different systems and processes. 2. Human brain functioning. 3. Connection between genotype and phenotype. 4. Life evolution. 5. Earthquake. 6. Evolution of stock market indexes. 7. Internet statistics and phase transitions in magnetic systems. 8. Uniform description by similar mathematics language. 9. Discrete scale invariance. 10. Stochastic resonance. 11. Self-organized critical state. 12. Fractals, renormalization group are part of it.					
Recommended literature: R. Serra, Introduction to the Physics of Complex Systems: The Mesoscopic Approach to Fluctuations, Non Linearity and Self-Organization, Pergamon 2003 N. Boccara, Modeling Complex Systems (Graduate Texts in Contemporary Physics), Springer, 2003. http://en.wikipedia.org/wiki/Complex_system					
Languages necessary to complete the course:					
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: prof. RNDr. Peter Babinec, 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/2-FBM-206/15	Course title: Planning and Assessment of Experiments with Applications in Biomedicine and Biophysics
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: 3.	
Educational level: II.	
Prerequisites:	
Recommended prerequisites: -	
Antirequisites: FMFI.KJFB/2-FBM-206/00	
Course requirements: Preliminary evaluation: homeworks Final exam: oral / written written exam Indicative evaluation 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 know the general principles of scientific research, methods of designing and analyzing data from experiments and studies in the field of biomedicine and biophysics. They will learn how to apply these methods in practical examples or research situations from the formulation of a working hypothesis, methodological scheme, through data collection and processing, to communicating the results. They gain skills in operating analytical software systems.	
Class syllabus: Introduction to the problematics, an overview of basic research hypotheses as well as of experimental and clinical designs. Experimental planning, formulation of working hypothesis, choice and character of factors (inputs), levels of factors, interactions, definition and measurement of response (outcome), sources of variability. Structure and organization of individual experiments, conditions for performing the experiment/study, methods for increasing the accuracy and reliability of the results (sample size, randomization, stratification). Introduction to project administration, data collection, sorting and cleaning. Data set description and analysis: basic terminology, probability and distributions, descriptive statistics, testing hypotheses about differences, testing bioequivalence, testing hypotheses about relationships, performance analysis of diagnostic tests. Introduction to multivariate approaches. Graphical, tabular and textual presentation of results.	

Interpretation of results and formulation of research conclusions. The most common mistakes and shortcomings in biomedical research.					
Recommended literature: Základy statistiky pro biomedicínské obory / Jana Zvárová. Praha : Karolinum, 2011 Data a znalosti v biomedicině a zdravotnictví / editoři Jana Zvárová, Lenka Lhotská, Vladimír Přibík. Praha : Karolinum, 2010 Statistical Methods in Medical Research / P. Armitage, G. Berry, J.N.S. Matthews. Malden, Mass. : Blackwell Science, 2002 Základy informatiky pro biomedicínu a zdravotnictví / Jana Zvárová ... [et al.]. Praha : Karolinum, 2002 Metody molekulární biologie a bioinformatiky / Jana Zvárová ... [et al.]. Praha : Karolinum, 2012 How to report statistics in medicine : Annotated guidelines for authors, editors, and reviewers / Thomas A. Lang, Michelle Secic. Philadelphia : American College of Physicians, 1997 Biomechanika lidského skeletu a umělých náhrad jeho částí / Jiří Nedoma ... [et al.]. Praha : Karolinum, 2006 Systémy pro podporu lékařského rozhodování / Jana Zvárová ... [et al.]. Praha : Karolinum, 2009					
Languages necessary to complete the course: Slovak in combination with English (some of the suggested readings are in English)					
Notes: -					
Past grade distribution Total number of evaluated students: 121					
A	B	C	D	E	FX
81,82	14,05	4,13	0,0	0,0	0,0
Lecturers: doc. RNDr. Iveta Waczulíková, 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/2-FBF-108/15		Course title: Quantum Theory of Molecules			
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: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature: Molecular quantum mechanics / Peter Atkins, Ronald Friedman. Oxford : Oxford University Press, 2005 Szabo, N. S. Ostlund; Modern Quantum Chemistry, Introduction to Advanced Electronic Structure Theory, McGraw-Hill, Toronto, 1989					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 51					
A	B	C	D	E	FX
78,43	19,61	1,96	0,0	0,0	0,0
Lecturers: prof. RNDr. Peter Babinec, CSc., Mgr. Ivan Sukuba, PhD., prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc.					
Last change: 11.01.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBM-141/00	Course title: Radiation Biophysics
Educational activities: Type of activities: lecture Number of hours: per week: 1 per level/semester: 13 Form of the course: on-site learning	
Number of credits: 1	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: The evaluation of the course takes the form of a project which the student defends. The course will be graded with a passing grade provided that the student demonstrates at least 51% compliance. Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0). Scale of assessment (preliminary/final): 0/100	
Learning outcomes: After completing the course, students will gain basic knowledge of microdosimetry and will be able to apply them to evaluate the radiation risk of ionizing radiation.	
Class syllabus: Particle interaction and radiation energy storage in the material environment. Basic microdosimetric quantities. Experimental methods for obtaining microdosimetric spectra. Calculation of linear and specific energy spectra. Dose - effect relationship. Time course of the effects of ionizing radiation. Deterministic effects of ionizing radiation, Stochastic effects of ionizing radiation. Radiation effect of ionizing radiation with high LET (Bragg peak, relationship between LET and RBE, direct and indirect effect of ionizing radiation, radiation fractionation). Mathematical modeling of the dose-effect relationship (intervention and multi-intervention theory, two-way model, threshold-specific energy model, multimutation models, linear quadratic model, assumptions, derivation, utilization limits, survival curves and their interpretation). Exposure to radiation from natural and other sources. Epidemiological studies - a source of information on stochastic effects.	
Recommended literature: Radiation physics for medical physicists / E. B. Podgoršak. Heidelberg : Springer, 2010 Microdosimetry and Its Applications / Harald H. Rossi, Marco Zaider Springer, 1996	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution					
Total number of evaluated students: 85					
A	B	C	D	E	FX
98,82	1,18	0,0	0,0	0,0	0,0
Lecturers: RNDr. Radoslav Böhm, PhD.					
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.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.KJFB/2-FBF-125/15		Course title: Semester Project			
Educational activities: Type of activities: independent work Number of hours: per week: 6 per level/semester: 78 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBF-125/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 25					
A	B	C	D	E	FX
88,0	12,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, 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.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-priebezhneho-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.KJFB/2-FBF-111/00		Course title: Special Practical (1)			
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: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1. Safety regulations for the work with chemic and biological materials. 2. Solutions of the precise concentration, calculations, preparation and precise determination of the concentration. Volumetric accessories and its use. 3. Preparation and factorization of standard solutions of acids and bases. 4. Simple acidimetric titrations 5. – 6. Determination of partition coefficient of Iodine in system chloroform/water and determination of equilibrium constant for formation of I3(-). 7. – 8. Determination of molar mass of apple pectin from viscosity measurement 9. – 10. Study of kinetics of simple reactions. Measurement of rate constant and activation enthalpy of saccharose inversion using polarimetric method. 11. – 12. Colorimetric measurement of concentration. Protein concentration according to Lowry and Bradford methods.					
Recommended literature: T. Šipocz et al. Practical to the Experimental Methods of Biophysics. Text Nook, Comenius University,1989 (in Slovak) O. Vollárová, O. Grančičová, Excercises from the Methods of Physical Chemistry, Text Book, Comenius University, 1990 (in Slovak)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 25					
A	B	C	D	E	FX
64,0	16,0	8,0	4,0	0,0	8,0

Lecturers: RNDr. Peter Rybár, PhD., Mgr. Zuzana Garaiová, PhD., RNDr. Marcela Morvová, 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: FMFI.KJFB/2-FBF-112/00		Course title: Special Practical (2)			
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: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: 1-2. Introductory statistics, concepts, models, and applications 3-4 Analysis of variance (ANOVA), regression analysis 5-6. Quantitative morphology of muscular tissue 7-8. Electron microscopy 9-10. Turbidimetric studies on lipid vesicles' aggregation and fusion 11-12. Fluorescence spectroscopy analysis					
Recommended literature: V. Prosser et al., Experimental Methods of Biophysics, Academia, Praha 1989 (in Czech). T.A. Lang and M. Secic, How to Report Statistics in Medicine, ACP Philadelphia PA, 1997. Compiled training material. B. Nölting, Methods in Modern Biophysics, Springer, 2006. G.G. Hammes, Spectroscopy fo Biological Sceinces, Wiley, 2005 I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
60,87	30,43	4,35	0,0	4,35	0,0
Lecturers: RNDr. Peter Rybár, PhD., Mgr. Zuzana Garaiová, PhD., RNDr. Marcela Morvová, 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: FMFI.KJFB/2-FBF-115/00		Course title: Special Seminar (1)			
Educational activities: Type of activities: seminar Number of hours: per week: 1 per level/semester: 13 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: At this seminar the faculty members and the external collaborators will present informal lectures to the students describing their research activities On the base of this presentation the students will select the theme of the project.					
Recommended literature: According to the recommendation of the project supervisor					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
95,65	4,35	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, 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.KJFB/2-FBF-225/15		Course title: Special Seminar (2)			
Educational activities: Type of activities: seminar Number of hours: per week: 1 per level/semester: 13 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBF-225/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 12					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, 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.KTV/2-MXX-115/17		Course title: Sports in Natur (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: II.					
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. 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: 83					
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: FMFL.KTV/2-MXX-116/18		Course title: Sports in Natur (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: II.					
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: 50					
A	B	C	D	E	FX
94,0	0,0	0,0	0,0	0,0	6,0

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., 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.KJFB/2-FBF-141/11		Course title: Theoretical Fundamentals of Molecular Spectroscopy			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: oral exam scale: A 90%, B 80%, C 70%, D 60%, E 51% Scale of assessment (preliminary/final): 0/100					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 13					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc.					
Last change: 18.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FBF-130/15		Course title: Theory of Intermolecular Systems			
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: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FBF-130/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature: Margenau, H. and Kestner, N.: Theory of inter-molecular forces, International Series of Monographs in Natural Philosophy, Pergamon Press, 1968					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 20					
A	B	C	D	E	FX
95,0	5,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Peter Babinec, CSc.					
Last change: 11.01.2022					
Approved by:					