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COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-LF.AÚ/1-BMF-120/00	Anatomy (1)

Educational activities:
Type of activities: lecture / laboratory 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: 1.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: test
Final exam: oral / Summer
Indicative evaluation scale: A 94%, B 88%, C 82%, D 76%, E 70%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student will master the basic anatomical nomenclature and gain knowledge about the architecture and structure of the human body, namely the individual parts of the skeletal system and the joints of bones, muscles, digestive, respiratory and excretory system, male and female genitals organs.

Class syllabus:
Lectures: Introduction into study of anatomy. General osteology, arthrology, myology. The digestive system. The respiratory system. The excretory system. Female genitals. Male genitals.
Practical lessons: Vertebrae, joints of the vertebral column. Thorax skeleton, joints of the thorax. Skeleton of the upper limb. Skeleton of the lower limb. Joints of the upper and lower limbs. Skull. Test. Muscles of the upper limb. Muscles of the lower limb.. Muscles of the thorax, back and abdomen. Muscles of the head and neck. Test

Recommended literature:
Beňuška, J. a kol. Anatómia pre medziodborové štúdium I. Bratislava: UK, 1995. 176 s.
Mráz, P. a kol.: Anatómia pre medziodborové štúdium II. Bratislava: UK, 2001. 195 s.
Beňuška, J. a kol. Anatómia pre nelekárske študijné odbory 1. Bratislava: UK, 2005. 148 s.
Beňuška, J. a kol. Anatómia pre nelekárske študijné odbory 2. Bratislava: UK, 2005. 136 s.

Languages necessary to complete the course:
Slovak in combination with English

Notes:

Past grade distribution
Total number of evaluated students: 266

A	B	C	D	E	FX
35,34	28,95	18,8	8,65	7,89	0,38

Lecturers: doc. RNDr. Ladislav Guller, CSc., doc. MUDr. Eliška Kubíková, PhD., MPH

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:	**Course title:**
FMFI-LF.AÚ/1-BMF-155/00	Anatomy (2)

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: test
Final exam: oral / Summer
Indicative evaluation scale: A 94%, B 88%, C 82%, D 76%, E 70%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student masters the basic anatomical nomenclature and gains additional knowledge about the structure and structure of the human body: cardiovascular, lymphatic and nervous system, sensory organs and endocrine glands.

Class syllabus:
Lectures: Heart. Arteries. Veins. Lymphatic system. Spinal cord, spinal nerves. Medulla oblongata, pons. Cerebellum. Mesencephalon. Diencephalon. Telencephalon. Cranial nerves. Autonomic nervous system. Sense organs. Endocrine system. Skin.
Practical lessons: Demonstration of the digestive system organs. Demonstration of the respiratory system organs. Demonstration of the urinary and reproductive system organs. Test. Heart. Vessels of the thorax, abdomen, head, neck, and limbs. Spinal cord, spinal nerves.Cranial nerves.Test. Brain.

Recommended literature:
Beňuška, J. a kol. Anatómia pre medziodborové štúdium I. Bratislava: UK, 1995. 176 s.
Mráz, P. a kol.: Anatómia pre medziodborové štúdium II. Bratislava: UK, 2001. 195 s.
Beňuška, J. a kol. Anatómia pre nelekárske študijné odbory 1. Bratislava: UK, 2005. 148 s.
Beňuška, J. a kol. Anatómia pre nelekárske študijné odbory 2. Bratislava: UK, 2005. 136 s.

Languages necessary to complete the course:
Slovak in combination with English

Notes:

Past grade distribution
Total number of evaluated students: 213

A	B	C	D	E	FX
36,15	17,84	15,49	8,92	12,68	8,92

Lecturers: doc. MUDr. Eliška Kubíková, PhD., MPH, doc. RNDr. Ladislav Guller, CSc.

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:	**Course title:**
FMFI.KJFB/1-UFY-241/10	Atomic and Nuclear Physics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 39 / 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: presentation of homework results (3x10 marks)
Exam: written (40 marks), oral (30 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% points.

Learning outcomes:
Graduates have a basic knowledge of Atomic and Nuclear Physics at the level of a core university course in general physics. They know how to use the concepts and methods of atomic and nuclear physics in solving problem situations. They have an idea of the boundaries between high school and university physics in the field of nuclear and nuclear in terms of work with high school youth with an increased interest in physics.

Class syllabus:
Photoelectric effect, Compton effect, Rutherford experiment, Bohr model, timeless Schrödinger equation, structure of atoms and molecules, basic properties of nuclei, structure of nuclei, transformation of nuclei, nuclear reactions, nuclear power plant, particle accelerators.

Recommended literature:
Fyzika část 5. Moderní fyzika : Vysokoškolská učebnice obecné fyziky / David Halliday, Robert Resnick, Jearl Walker ; přeložili Bohumila Lencová ... [et al.]. Brno : Vysoké učení technické VUTIUM, 2000
Všeobecná fyzika : 4 : atómová fyzika / Ján Vanovič. Bratislava : Alfa, 1980
Physics : principles with applications / Douglas C. Giancoli. Upper Saddle River, N.J. : Pearson/ Prentice Hall, 2005
Own electronic texts of the subject published through the course website.

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 147

A	B	C	D	E	FX
22,45	15,65	19,73	15,65	22,45	4,08

Lecturers: RNDr. Radoslav Böhm, PhD., Ing. Jakub Kaizer, 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:	**Course title:**
FMFI.KJFB/1-BMF-910/15	BSc Project

Educational activities:
Type of activities: other
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 58

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

Lecturers: doc. RNDr. Iveta Waczulíková, PhD.

Last change: 02.06.2015

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/1-BMF-991/15	**Course title:** BSc Thesis Defense
Number of credits: 10	
Educational level: I.	
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:	**Course title:**
FMFI.KJFB/1-BMF-930/00	Bachelor Thesis Seminar

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: individual presentation, discussion
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Moderated and guided presentations concerning: information from the literature, on the background of the research problem; formulation of research hypothesis and specific goals of the bachelor thesis; experimental design and experimental and theoretical methodologies used to address the objectives of the bachelor's thesis; processing, evaluating and communicating own results, interpreting and discussing results; formulation of conclusions (summary).

Recommended literature:
Biophysics : a physiological approach / Patrick F. Dillon. Cambridge : Cambridge University Press, 2012
Introduction to experimental biophysics : Biological methods for physical scientists / Jay Nadeau. Boca Raton : CRC Press, 2012
Biomedical devices and their applications / D. Shi (Ed.). Berlin : Springer, 2004
Základy statistiky pro biomedicínské obory / Jana Zvárová. Praha : Karolinum, 2011
Spracovanie experimentálnych dát / František Kundracik, Jozef Masarik, Štefan Dubnička. Bratislava : Univerzita Komenského, 1999
Sprievodca metodológiou kvalitatívneho výskumu / Peter Gavora. Bratislava : Univerzita Komenského, 2007
How to report statistics in medicine : Annotated guidelines for authors, editors, and reviewers / Thomas A. Lang, Michelle Secic. Philadelphia : American College of Physicians, 1997
According to the BSc thesis

Languages necessary to complete the course:
Slovak in combination with English (research)

Notes:

Past grade distribution
Total number of evaluated students: 152

A	B	C	D	E	FX
94,74	2,63	0,0	0,0	0,0	2,63

Lecturers: doc. RNDr. Iveta Waczulíková, PhD.

Last change: 12.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/2-FOL-116/15	Basic Electronics

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 3 / 3 **per level/semester:** 39 / 39
Form of the course: on-site learning

Number of credits: 7

Recommended semester: 5.

Educational level: I., II.

Prerequisites:

Course requirements:
Continuous assessment: work on practical exercises (100%). The condition for granting credits is the presentation of a semester project.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will understand the principles of using basic building blocks (resistor, inductance, capacitance, diode, transistor) in digital and analog circuits. They will understand the principles and use of basic digital and analog circuits (gates, counters, timers, operational amplifier, A / D and D / A converters, Arduino microprocessor system), principles of generating harmonic and non-harmonic signals and linear and pulse power supplies. They will be able to analyze basic circuits and use them to design simple electronic circuits with the required functionality. He will also gain practical experience with the construction and revitalization of simple electronic circuits.

Class syllabus:
Semiconductor diode and transistor and their basic connections. Transistor in switching mode, TTL digital circuits and their use. Basic logic circuits. Comparator. Timer 555. D / A and A / D converters. Arduino microprocessor system. Nodal potential method. Analysis of linear circuits in time and frequency domain. Linear model of transistor and operational amplifier. Basic circuits with operational amplifier. Positive feedback and oscillator principles. Power supplies and rectifiers.

Recommended literature:
The art of electronics / Paul Horowitz, Winfield Hill. New York : Cambridge University Press, 1989

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 101

A	B	C	D	E	FX
95,05	0,0	3,96	0,0	0,0	0,99

Lecturers: doc. RNDr. František Kundracik, CSc., RNDr. Matej Klas, PhD., doc. RNDr. Juraj Országh, PhD.

Last change: 27.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM+KJFB/1-BMF-110/15	Basics of Mathematics (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 4 **per level/semester:** 52 / 52
Form of the course: on-site learning

Number of credits: 8

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: 3 written partial exams (100%)
Final exam: oral (45%) / written (55%)
Indicative evaluation scale: A 90%, B 80%, C 70%, D 65%, E 55%
Scale of assessment (preliminary/final): 40/60
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course, students will gain basic knowledge and skills of linear algebra and geometry and differential calculus for functions of one real variable.

Class syllabus:
Linear algebra and geometry (determinants, matrices, systems of linear equations, linear spaces, linear mappings, scalar and cross products, quadratic forms).
Differential calculus for functions of one real variable (limits and continuity, the derivative and differentiability, main theorems of the differential calculus and their consequences, Taylor's formula, graphing a function).

Recommended literature:
Matematika 1 : Pre štúdium technických vied / I. Kluvánek...[et al.]. Bratislava : SVTL, 1966
Matematika 1 : Príručka pre vysoké školy technické / Ján Ivan. Bratislava : Alfa, 1984
Lineárna algebra a geometria : Cesta z troch rozmerov s presahmi do príbuzných odborov / Pavol Zlatoš. Bratislava : Albert Marenčin, 2011
Zbierka úloh z vyššej matematiky : 1. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1971
Zbierka úloh z vyššej matematiky : 2. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Slovenské vydavateľstvo technickej literatúry, 1966
Zbierka úloh z vyššej matematiky : 3. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Slovenské vydavateľstvo technickej literatúry, 1967

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 162

A	B	C	D	E	FX
8,02	11,11	14,81	14,2	20,99	30,86

Lecturers: doc. RNDr. Eugen Viszus, CSc., RNDr. Radoslav Böhm, 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:	**Course title:**
FMFI.KMANM+KJFB/1-BMF-150/15	Basics of Mathematics (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 4 **per level/semester:** 52 / 52
Form of the course: on-site learning

Number of credits: 8

Recommended semester: 2.

Educational level: I.

Prerequisites: FMFI.KMANM+KJFB/1-BMF-110/15 - Basics of Mathematics (1)

Recommended prerequisites:
1-BMF-110 Basics of mathematics (1)

Course requirements:
Preliminary evaluation: 3 written partial exams (100%)
Final exam: oral (45%) / written (55%)
Indicative evaluation scale: A 90%, B 80%, C 70%, D 65%, E 55%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course, students will gain basic knowledge and skills of differential calculus for functions of several variables, integral calculus for functions of one variable, convergence of series and elementary methods of solving ordinary differential equations.

Class syllabus:
Differential calculus for vector-valued functions of one real variable, differential calculus for functions of several real variables (limits and continuity, partial derivative and differentiability, Taylor's formula, extremal points, implicit functions, constrained critical points). Integral calculus for functions of one real variable (indefinite integral, Riemann's definite integral, improper integral). Series, elementary methods of solving ordinary differential equations.

Recommended literature:
Matematika pre štúdium technických vied : 1. diel / Igor Kluvánek, Ladislav Mišík, Marko Švec. Bratislava : Slovenské vydavateľstvo technickej literatúry, 1959
Matematika pre štúdium technických vied : 2 diel / I. Kluvánek...[et al.]. Bratislava : SVTL, 1965
Matematika 1 : Príručka pre vysoké školy technické / Ján Ivan. Bratislava : Alfa, 1984
Matematika 2 / Ján Ivan. Bratislava : Alfa, 1989
Zbierka úloh z vyššej matematiky : 2. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1986
Zbierka úloh z vyššej matematiky : 3. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Slovenské vydavateľstvo technickej literatúry, 1967

Zbierka úloh z vyššej matematiky : 4. časť / Jozef Eliaš ... [et al.]. Bratislava : Alfa, 1972

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 124

A	B	C	D	E	FX
7,26	8,06	19,35	20,16	25,81	19,35

Lecturers: doc. RNDr. Eugen Viszus, CSc., RNDr. Radoslav Böhm, 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:	**Course title:**
FMFI.KMANM/1-BMF-226/15	Basics of Mathematics (3)

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: I.

Prerequisites:

Course requirements:
Preliminary evaluation: tests/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): 70/30

Learning outcomes:
Acquisition of knowledge. The student will be able to use integral calculus in N-dimensional Euclidean spaces, line integral as a tool for solving physical problems. He will also be acquainted with the use of power series methods.

Class syllabus:
1. Power series, Taylor series
2. Multidimensional integrals
3. Line integrals, potential vector fields

Recommended literature:
Matematika : diel 1 : pre štúdium technických vied / Igor Kluvánek, Ladislav Mišík, Marko Švec. Bratislava : Alfa, 1971
Matematika pre štúdium technických vied : 2. diel / Igor Kluvánek, Ladislav Mišík, Marko Švec. Bratislava : Alfa, 1970
Cvičenia z matematickej analýzy II / Zbyněk Kubáček, Ján Valášek. Bratislava : Univerzita Komenského, 1996
Matematická analýza IV / Mária Barnovská, Kristína Smítalová. Bratislava : Univerzita Komenského, 1984
Zbierka úloh z vyššej matematiky : 1. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1968

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 134

A	B	C	D	E	FX
9,7	11,19	13,43	17,16	27,61	20,9

Lecturers: RNDr. Michal Demetrian, PhD., doc. RNDr. Eugen Viszus, CSc.

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:	**Course title:**
FMFI.KMANM/1-BMF-261/15	Basics of Mathematics (4)

Educational activities:
Type of activities: lecture / practicals / independent work
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26 / 20s
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 117

A	B	C	D	E	FX
14,53	16,24	13,68	17,95	25,64	11,97

Lecturers: RNDr. Michal Demetrian, PhD., doc. RNDr. Eugen Viszus, CSc.

Last change: 16.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-OZE-610/15	Basics of Radiation Physics and Radiation Protection

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: 4.

Educational level: I.

Prerequisites:

Course requirements:
Final exam: written
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Graduates of the course will acquire a basic knowledge of radiation physics and the principles of radiation protection and will also gain a comprehensive view of the applications of ionizing radiation in practice.

Class syllabus:
Basic concepts of nuclear physics: simple nuclear model, stable and radioactive nuclei, nuclear reactions, excited nuclear and atomic states. Sources of ionising radiation: radionuclide sources, nuclear reactors, accelerators as sources of ionising radiation. Processes of interaction of ionizing radiation with matter: interaction of gamma and X-rays, charged particles and neutrons with the material environment. Quantities and units in radiation physics and protection: quantities characterising radiation sources, radiation fields, the effect of radiation on matter, relationships between radiation quantities. Biological effects of ionising radiation and their impact on health. Environmental radioactivity: sources of radioactivity, distribution of radionuclides in nature, radiotoxicity. Applications of ionising radiation: medical diagnostics and therapy, nuclear power, industrial radiation sources, radioactive dating. Radioactive waste. Basic principles of radiation protection. Radiation protection of workers, population and the environment. Dose limits. Monitoring in radiation physics and protection.

Recommended literature:
O.Holá, K.Holý: Radiačná ochrana- Ionizujúce žiarenie, jeho účinky a ochrana pred ionizujúcim žiarením. STU, Bratislava,2010.
V.Klener: Principy a praxe radiační ochrany, SUJB, Praha, 2000

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 80

A	B	C	D	E	FX
68,75	7,5	12,5	7,5	3,75	0,0

Lecturers: doc. RNDr. Karol Holý, CSc., doc. RNDr. Monika Müllerová, 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:	**Course title:**
FMFI.KMANM/1-MAT-510/00	Biomathematics (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: 5.

Educational level: I.

Prerequisites: FMFI.KMANM/1-MAT-250/14 - Mathematical Analysis (4) or FMFI.KMANM/1-MMN-250/17 - Mathematical Analysis (4) or FMFI.KMANM/1-BMF-261/15 - Basics of Mathematics (4)

Course requirements:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Selection dynamics and population genetics: Hardy-Weinberger law for two and more alleles, the selection equation, the mutation selection equation, the selection recombination equation.
Models of population ecology: logistic equation, Lotka-Volterra equations for predator-prey systems with and without intraspecific competition.

Recommended literature:
J. Hofbauer, K. Sigmund: The Theory of Evolution and Dynamical systems, Cambridge University Press, Cambridge 1988.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 141

A	B	C	D	E	FX
51,77	17,73	18,44	7,8	3,55	0,71

Lecturers: prof. RNDr. Jaroslav Jaroš, 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:	**Course title:**
FMFI.KMANM/1-MAT-515/00	Biomathematics (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: 6.

Educational level: I.

Prerequisites: FMFI.KMANM/1-MAT-510/00 - Biomathematics (1)

Course requirements:

Learning outcomes:

Class syllabus:
Models of population ecology: the equilibria and their stability, Lotka-Volterra equations for more than two populations.
Game dynamics: evolutionary stable strategies, evolution of phenotypes, equations for asymmetric games.

Recommended literature:
J. Hofbauer, K. Sigmund: The Theory of Evolution and Dynamical systems, Cambridge University Press, Cambridge 1988.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 63

A	B	C	D	E	FX
42,86	15,87	23,81	14,29	1,59	1,59

Lecturers: prof. RNDr. Jaroslav Jaroš, 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:	**Course title:**
FMFI.KAI/1-AIN-407/15	Brain and Mind

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1., 3., 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 154

A	B	C	D	E	FX
48,05	18,83	15,58	8,44	2,6	6,49

Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.

Last change: 21.03.2022

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/1-BMF-961/15	**Course title:** Chemical and Biological Basics of Medicine
Number of credits: 2	
Educational level: I.	

Course requirements:
Final exam: state final exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The condition for passing the course is successful completion of the state exam

Class syllabus:
1. Spine, vertebrae, joints, function
2. Chest, skeleton, connections, function
3. Skull bones
4. Skeleton of the upper limb, conjunctions
5. Skeleton of the lower limb, conjunctions
6. Pelvis
7. Oral cavity, pharynx, oesophagus, stomach, and their function
8. Small and large intestine, and their function
9. Liver, bile ducts, gallbladder, pancreas, and their function
10. Nasal cavity, larynx, trachea, and their function
11. Bronchi, lungs, and their function
12. External description of heart, cavities and valves of heart, and their function
13. Transmission system and blood vessels of heart, function
14. Pulmonary blood circulation, physiological properties
15. Body blood circulation, physiological properties
16. Excretory system, functions
17. Medulla spinalis, medulla oblongata, pons, cerebellum, and their function
18. Mesencephalon, diencephalon, and their function
19. Telencephalon, primary, secondary and tertiary and associative cortical areas
20. CNS cavities and casings
21. Autonomic nervous system, and their function
22. Epithelial tissue, and its function
23. Muscle tissue, supportive and connective tissue
24. Blood and haematopoiesis, blood groups, blood clotting
25. Nerve tissue, neuron, its function
26. Microscopic anatomy of cardiovascular system (heart, arteries, capillaries, veins) and respiratory system
27. Microscopic anatomy of digestive system (hollow organs of the digestive system, glandular organs of digestive system (salivary glands, liver, pancreas, gallbladder))
28. Microscopic anatomy of central and peripheral nervous system, and endocrine glands

29. Homeostasis
30. Negative and positive feedback
31. Endocrine system
32. Neuron, nerve excitement, resting membrane potential, receptor potential, action potential, neuromuscular transmission
33. Reflex arc
34. Basic physiological properties of heart muscle (automation, conductivity, irritability, contractility)
35. Cardiac cycle
36. Cardiac output, preload, contractility, afterload
37. ECG
38. Blood flow in blood vessels, blood pressure, factors influencing blood pressure
39. Blood capillaries, hydrostatic and oncotic pressure in capillaries
40. Nervous and humoral regulation of cardiovascular system activity
41. Ventilation, tidal volumes, dead space
42. Diffusion, perfusion, transmission of respiratory gases in blood, oxygen supply
43. Nephron and its function, glomerular filtration, tubular processes in kidneys
44. The role of kidneys and respiration in regulation of acid-base balance, blood pH, maintenance of acid-base balance
45. Sensory perception, sight, hearing, taste, smell, balance, pain
46. Movement regulation
47. Bioenergetics (glycolysis, Krebs cycle, oxidative phosphorylation)
48. Nutrition, work metabolism, thermoregulation

State exam syllabus:

Recommended literature:
Recommended study literature

Languages necessary to complete the course:
Slovak in combination with English

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:	**Course title:**
FMFI.KAI/1-AIN-408/15	Cognitive Laboratory

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3., 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
70,37	12,96	7,41	1,85	0,0	7,41

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 14.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/1-BMF-181/15	Complementary Classes in Mechanics

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: tests
Final exam: test
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 much more experienced with the formulation and mathematical expression of selected problems in mechanics.

Class syllabus:
Translational motion. Rotational motion. Newton's laws of dynamics, force, momentum. Gravitational field. Work, kinetic and potential energy, moment of force, angular momentum. Conservation laws in mechanics. Rigid body mechanics, center of gravity, moment of inertia, Steiner's theorem, rotational motion. Fluid mechanics. Oscillations - free, damped and driven, resonance.

Recommended literature:
Fyzika1 / David Halliday, Robert Resnick, Jearl Walker. Brno: VUTIUM, 2013
Fyzika v príkladoch / Vladimír Hajko. Bratislava : Slovenské vydavateľstvo technickej literatúry, 1967

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 72

A	B	C	D	E	FX
75,0	11,11	9,72	1,39	2,78	0,0

Lecturers: RNDr. Milan Zvarík, 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:	**Course title:**
FMFI.KJFB/1-BMF-521/15	Computer Modelling

Educational activities:
Type of activities: course
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: programming a selected model of a real-life problem
Final exam: oral / written oral exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The graduate of the course will handle the basics of creating a description of real systems and their transformation into a model. He/she can implement individual parts of the systems and the relationships between them in a computer simulation environment and analyze the obtained simulation results.

Class syllabus:
Defining basic concepts, creation of mathematical models, advantages and disadvantages of models, characterization of system parts and their interactions, work in GNU Octave/Matlab, use of the program in numerical solution of problems of mathematical analysis, linear algebra and differential equations, visualization of model outputs, data analysis, Monte Carlo simulations, simulations of systems with N moving particles, simulations of connections between system entities.

Recommended literature:
Matlab / Jela Babušíková. Bratislava : Knižničné a edičné centrum FMFI UK, 2007
Physical Modeling in Matlab / Allen B. Downey. Needham : Green Tea Press 2011 https://greenteapress.com/wp/physical-modeling-in-matlab/
An Introduction to Computer Simulation Methods: Applications To Physical Systems / Harvey Gould, Jan Tobochnik, Wolfgang Christian, San Francisco: Pearson, 2007, ISBN 0-8053-7758-1

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 35					
A	B	C	D	E	FX
97,14	2,86	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Ján Urban, DrSc., RNDr. Ing. Milan Melicherčík, PhD.					
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:	**Course title:**
FMFI.KEF/1-FYZ-211/17	Electromagnetism and Optics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 6 / 4 **per level/semester:** 78 / 52
Form of the course: on-site learning

Number of credits: 11

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 245

A	B	C	D	E	FX
20,41	11,02	17,96	19,18	22,86	8,57

Lecturers: prof. RNDr. Peter Markoš, DrSc., doc. RNDr. František Kundracik, CSc., Mgr. Róbert Astaloš, PhD.

Last change:

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-233/13	English Conversation Course (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3., 5.

Educational level: I., II.

Prerequisites:

Course requirements:
tests, presentations, essays
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-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:	**Course title:**
FMFI.KJP/1-MXX-234/13	English Conversation Course (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4., 6.

Educational level: I., II.

Prerequisites:

Course requirements:
tests, oral presentations, essays
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational/spoken English as well as English for specific purpose appropriate for university students. This course is a follow up of the Conversational English course 1.

Class syllabus:
This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge(Upper-Intermediate/Lower Advanced).

Recommended literature:
Appropriate study material is supplied based on the participants'level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 146

A	B	C	D	E	FX
77,4	12,33	3,42	1,37	0,0	5,48

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-131/00	English Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.

Class syllabus:
On entering the first semester, students´ knowledge of English is tested and they are divided into groups according to the results of the placement test. In the groups of pre-intermediate and intermediate students, fundamentals of technical English are taught. Advanced students take classes of technical English for their field of study: English for mathematics, for physics, for computer science, English for management and economic and financial mathemathics.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 5840

A	B	C	D	E	FX
30,6	23,8	18,29	12,47	7,45	7,4

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

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-132/00	English Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.

Class syllabus:
This is a continuation of the course English (1) designed for pre-intermediate students. Fundamental vocabulary is presented through selected topics in mathematics, physics and informatics. The lessons also contain revision of elementary grammar. Generally, it is a necessary preliminary to advanced programs.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1582

A	B	C	D	E	FX
22,06	20,54	24,27	15,36	10,81	6,95

Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD.
Last change: 20.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-231/00	English Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the classes is to provide the students with knowledge of technical English in their field of study and experience with technical English sources sufficient to make the able to use technical language for their later study and professional purposes.

Class syllabus:
The subject continues the program of English (2). Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathemathics.
The subject requires advanced knowledge of general English.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1326

A	B	C	D	E	FX
16,06	19,53	23,23	18,1	17,5	5,58

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

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-232/10	English Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Examination: an examination consisting of a written and an oral part.
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/skuska-z-predmetu-anglicky-jazyk-4/
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students will be able to work independently with professional literature in English

Class syllabus:
Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathemathics.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 3345

A	B	C	D	E	FX
27,23	28,4	21,29	11,21	5,77	6,1

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

Last change: 17.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-FYZ-401/15	Fields of Physical Research

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 186

A	B	C	D	E	FX
99,46	0,54	0,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Jozef Masarik, DrSc.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-LF.ÚLChB/1-BMF-255/00	Foundations of Biochemistry

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: 4.

Educational level: I.

Prerequisites: FMFI-LF.ÚLChB/1-BMF-220/00 - Foundations of Chemistry in Living Systems

Course requirements:
Preliminary evaluation: Active participation in practical exercises, elaboration and submission of protocols, passing continuous tests
Final exam: written exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student will gain knowledge of biochemical processes and the principles of regulation in a living organism. Acquired knowledge will include practical application of knowledge gained in the course Foundations of Chemistry in Living Systems; gaining knowledge of principal biochemical and metabolic processes in the cell under physiological and selected pathological conditions; the ability to understand basic regulations of molecular processes and pathological causations of selected diseases. Student will also gain practical skills in the various laboratory methods employed in clinical diagnostic procedures and will be able to understand the principles of evaluation the laboratory results achieved during experimental laboratory practices.

Class syllabus:
Biological oxidations in living systems as the essential process for energy production. ATP formation in mitochondria, terminal oxidation, oxidative phosphorylation. Formation and utilization of acetyl-CoA, citrate cycle, the importance of the citrate cycle in cell energy production and in the process of gluconeogenesis. Carbohydrate metabolism, glycolysis, gluconeogenesis, pentose cycle, glycogen metabolism. Lipid metabolism, degradation and synthesis of higher carboxylic acids, formation of simple and complex lipids, lipoprotein metabolism. General reactions of amino acid metabolism, deamination and transamination, ammonia detoxification, urea synthesis. Metabolism of purine and pyrimidine nucleotides. General mechanisms of signal processes and regulation of metabolism. Involvement of hormones and other signalling molecules in the regulation of processes in the cell.

Recommended literature:

Lekárska biochémia I. / Kolektív autorov. Bratislava, UK, 2016
Lekárska biochémia: seminárna a praktická časť / Kolektív autorov. Bratislava, UK, 2016
Lekárska biochémia II. / Ladislav Turecký. Bratislava: Asklepios, 2014

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: 176

A	B	C	D	E	FX
19,89	13,64	17,05	18,18	22,73	8,52

Lecturers: doc. RNDr. Eva Uhlíková, CSc., doc. RNDr. Monika Ďurfinová, PhD., RNDr. Milada Laššánová, CSc., doc. Ing. Mária Chomová, 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:	**Course title:**
FMFI-LF.ÚLChB/1-BMF-220/00	Foundations of Chemistry in Living 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: 3.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation:
semester work– PowerPoint presentation; laboratory protocols, weekly tests
Final exam: written exam consisting of 3 parts (50 questions) 35 test questions, 10 creative questions and 5 calculations
Indicative evaluation scale: A 90%, B 80%, C 70%, D 65%, E 60%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student will gain knowledge of the foundations of chemistry in biomedical applications. He will be familiar with the structure, properties and biological function of important biogenic substances, some pathophysiological processess in the human body, such as oxidative stress, glycation, glycooxidation and inflammation, and the toxicity of inorganic and organic compounds. A student acquires the following skills: the ability to apply knowledge in a comprehensive understanding of metabolic processes and the principles of their regulation in the human body, as well practical skills in the field of physico-chemical and biochemical laboratory methods employed in a laboratory and clinical practice.

Class syllabus:
Lectures: Chemical bonding. Biogenic elements. Overview and principle of physico-chemical methods. Dispersion systems. Solutions. Chemical equilibrium in solutions of acids and bases. Characteristics of oxidation-reduction processes. Energetics and kinetics of chemical processes. Structure and properties of organic compounds. Hydrocarbons. Structure and biochemically important organic compounds of sulfur, nitrogen. Carbohydrates. Lipids. The importance of lipids in nutrition. Arachidonic acid. Terpenes. Steroids. Alkaloids. Amino acids. Peptides. Proteins. Polynucleotides. Nucleic acids. Nucleoproteins. Enzymology. Vitamins. Enzymes, importance of enzymology, multienzyme systems. Laboratory practices: Principles of physico-chemical methods (spectrophotometry, potentiometry, chromatography) and their application in laboratory diagnostics. Determination of selected metal ions in plasma, determination of their effect on erythrocyte fragility. Preparation of solutions, measuring and evaluation of the pH of body fluids.

Qualitative and quantitative determination of important physiological and pathological metabolites (urea, glucose, ketone bodies, total lipids, malondialdehyde). Thin layer and gel chromatography of amino acids and proteins. Determination and calculation of enzyme activity, monitoring the impact of various factors.

Recommended literature:
Lekárska chémia / Jana Muchová a kol. UK Bratislava, 2012, ISBN 978-80-223-3199-9

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: 192

A	B	C	D	E	FX
7,81	9,9	23,44	17,71	32,81	8,33

Lecturers: RNDr. Lucia Andrezálová, PhD., doc. PharmDr. Vladimír Jakuš, CSc., doc. Ing. Ingrid Žitňanová, PhD., doc. RNDr. Jana Muchová, PhD., prof. Ing. Zdeňka Ďuračková, 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:	**Course title:**
FMFI.KJP/1-MXX-141/00	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:	**Course title:**
FMFI.KJP/1-MXX-142/00	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:	**Course title:**
FMFI.KJP/1-MXX-241/00	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:	**Course title:**
FMFI.KJP/1-MXX-242/00	French Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The subject provides a course of intermediate French covering not only general, but also technical French language.

Recommended literature:
Menand Robert: Le Nouveau taxi 2, Hachette FLE, Paris, France 2009, ISBN 978-2-01-155551 - 9

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 74

A	B	C	D	E	FX
41,89	32,43	17,57	2,7	1,35	4,05

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-335/15	Fundamentals of Biomedical Physics

Educational activities:
Type of activities: lecture / seminar
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: active seminar presentation, homework
Exam: written
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
The graduate of the course knows the physical principles of physiological processes at various levels of the organization and the basic physical methods used for the study of biological objects with a focus on applications in medicine.

Class syllabus:
Relationship between physics, biology and medicine. Biomechanics - static force, friction, translation and rotating motion on the human body. Elasticity and strength of biomaterials. Fluids and fluid movement - blood circulation. Heat and kinetic energy. Electricity and electrical technologies - electrical signals in the human body. Optics - vision. Nanotechnology

Recommended literature:
Physics in biology and medicine / Paul Davidovits. San Diego : Harcourt Academic Press, 2001
Physics of the Human Body / Irving P. Herman. New York, Springer, 2016
Intermediate Physics for Medicine and Biology / Russell K. Hobbie, Brandley J. Roth. Minnesota, Springer, 2015

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 57

A	B	C	D	E	FX
50,88	28,07	14,04	5,26	1,75	0,0

Lecturers: RNDr. Marcela Morvová, PhD.
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/1-BMF-951/15	**Course title:** Fundamentals of Physics
Number of credits: 2	
Educational level: I.	
Course requirements: Final exam: State examination Scale of assessment (preliminary/final): 0/100	
Learning outcomes: The condition for passing the course is successful completion of the state examination	
Class syllabus: 1. Newton laws of dynamics, constant and acerated motion 2. Oscillations of a linear harmonic oscillator: undamped, damped 3. Forced oscillations, resonance 4. Mechanical energy, work, power, conservation laws (energy, momentum, angular momentum) 5. Basic laws of hydrostatics, hydrodynamics and their applications (Pascal's law, Archimedes' law, Bernoulli's equation, continuity equation) 6. Electric charge, electric field intensity, electric charge density. 7. Gauss's law and its use to calculate the electric field in symmetric cases. 8. Electrostatic field of a dipole and force effects of an electric field on a dipole. 9. Electric field around conductors and in their cavities. The relationship between the intensity of the electric field and the surface charge density. 10. Ampere's law and its use for calculation of magnetic fields in symmetric cases. 11. Electromagnetic induction, Lenz's law. 12. Basic properties of electromagnetic waves. Poynting vector. Light intensity. 13. Polarization of light (Fresnel equations, Brewster angle). Realization of polarized waves. 14. Interference of light waves (Beam coherence - methods for producing two coherent light sources) 15. Diffraction (Huygens-Fresnel principle, slit, difraction grating). 16. Rutherford scattering 17. X-rays 18. Bohr model of hydrogen atom and radiation spectra 19. Nuclear binding energy (Weizsäcker formula, applications) 20. Statistical law of radioactive decay 21. Alpha decay of nuclei, beta decay 22. Mechanisms of ionizing radiation interaction with matter. 23. Interaction of gamma radiation with matter 24. Physical principles of particle detection. 25. Continuous random variables. Probability density function. Expected value and mean squared deviation. State two examples of probability density functions. 26. The Drunkard's Walk. Dependence of the mean square of the distance on the number of steps.	

27. Maxwell's velocity distribution. The most probable value of the velocity and the average squared velocity.
28. Boltzmann distribution. Barometric formula.
29. The first law of thermodynamics for an ideal gas. Mayer's relationship.
30. Carnot cycle.
31. Gas work (isochoric, isobaric, isothermal, adiabatic process)
32. Gas entropy increment (isochoric, isobaric, isothermal, adiabatic process).
33. Two-state system (spin) at temperature T. Average energy.
34. Grand canonical distribution (Bose-Einstein distribution, Fermi-Dirac distribution).
35. Canonical ensemble. Statistical sum. Calculation of the expected value of energy from the statistical sum.
36. Passage of particles through the barrier - quantum tunnelling (importance in biology).

State exam syllabus:

Recommended literature:
Recommended study literature

Languages necessary to complete the course:
Slovak in combination with English (some of the suggested readings are in English).

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:	**Course title:**
FMFI.KEF/1-FYZ-212/15	Fundamentals of Programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Exam: practical (programming)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The student will understand the principles of computer processing of numbers and the resulting limitations (data types, including links, number fields). They will understand the basic structures of the program (functions, branches, ...) and their use to algorithmize problem solving. They will be able to program in C / C ++ language simpler algorithms for solving mathematical and physical problems (eg movement in fields, calculation of fields, sums of rows, ...).

Class syllabus:
Basic structure of C / C ++ program, data types and their accuracy, program branching (if..else, switch, for, while, do..while), functions, use of references to return multiple values of functions, two- and multidimensional fields, texts , field references, data flows and their control (cin, cout), working with files (fstream), concept of object, drawing simple graphs from C ++ program (xmgrace, GNUplot), Euler's method for solving differential equations and its use for solving motion problems , roots of functions, numerical integration and its use for solving physical problems, random numbers and Monte Carlo methods, basics of object-oriented programming.

Recommended literature:
Kundracik, F .: Basics of Programming Practically. Vydavateľstvo UK 2013. On-line: http:// www.fmph.uniba.sk/index.php?id=3246
Materials on the course page: http://davinci.fmph.uniba.sk/~kundracik1/ZakladyProgramovania/

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 212

A	B	C	D	E	FX
69,34	5,19	9,91	7,08	8,49	0,0

Lecturers: doc. RNDr. František Kundracik, CSc., doc. RNDr. Peter Papp, PhD.

Last change: 24.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-151/00	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:	**Course title:**
FMFI.KJP/1-MXX-152/00	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:	**Course title:**
FMFI.KJP/1-MXX-251/00	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:	**Course title:**
FMFI.KJP/1-MXX-252/00	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:	**Course title:**
FMFI.KAG/1-INF-240/15	Graphical Systems, Visualization, Multimedia

Educational activities:
Type of activities: course
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Recommended prerequisites:
The class does not require content prerequisites.

Course requirements:
Ongoing evaluation: individual work
exam
Indicative grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The content of the course provides, in accordance with the recommendations of the ACM Computing Curriculum, basic knowledge in the areas of Graphics and Visual Computing, Human-Computer Interaction, and relevant topics for Social and Professional Issues.
Graduates will be able to create digital content with freely available tools in the field of computer graphics and scientific and visualization.

Class syllabus:
- Reference model of computer graphics, architecture of multimedia system, methodology of mathematical modeling and visualization, application areas of computer graphics, visualization and multimedia. International standardization (ISO, Web Consortium, EU standards). Visual computing - brief history, social implications, economic and copyright aspects. Intellectual Property.
- Graphic communication. Geometric modeling (creation of simple objects). Basics of rendering. Use of API (OpenGL). HCl. Basics of human-machine communication. Design of a simple interactive graphical interface (GUI).
- Physical and logical input devices. GUI programming. Interactive aspects of multimedia systems and communication. Coding of graphic and multimedia information. Data compression principle. Functional standards for computer graphics and image processing. Web consortium. De facto standards (OpenGL, window systems). Graphics system and GUI functionality specification. Coordinate systems. Homogeneous coordinates. Affine transformations (scaling, rotation, translation). Implement a simple display channel. Line clipping and rasterization (DDA, Bresenham algorithm).

- Implementation of basic 2D graphic elements: polyline, fill area, text. Image hierarchy and 2D computer animation. Simple color models (RGB, CMYK). The cultural significance of some. colors. Website design. Using text in pictures. Web publishing.
- Human perception. Analog and digital representations for multimedia. Image and sound processing. Basic functions for visualization. History of visualization. Visualization scenarios. Interactive multimedia titles. Introduction to 3D graphics. Visibility problem and z-buffer. Light sources. Parameters of camera. Scene graph. VRML standard. Interaction of light and objects. Local lighting model and shading (constant, Gouraud, Phong). Textures. Photorealistic rendering.
- 3D scene modeling. Parametric and implicit representation. CSG and B-rep. Procedural modeling (fractals and particle systems).
- Computer. animation. Computer games and virtual reality. Scanning, modeling and display of medical data.

Recommended literature:

Computer graphics and image processing (in Slovak) / Eugen Ružický, Andrej Ferko. Bratislava: Sapientia, 1995. [online] http://www.sccg.sk/~ferko/PGASO2012-bookmarks.pdf
Fundamentals of interactive computer graphics / James D. Foley, Andries van Dam. Reading: Addison-Wesley, 1983
Class materials available from the class website.

Languages necessary to complete the course:

English, Slovak

Notes:

The class is eventually taught in a distant mode, as well.

Past grade distribution

Total number of evaluated students: 1098

A	B	C	D	E	FX
24,59	26,59	21,95	11,38	7,56	7,92

Lecturers: doc. RNDr. Andrej Ferko, PhD., Mgr. Marcel Makovník

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:	**Course title:**
FMFI-LF.ÚHE/1-BMF-160/00	Histology (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 1 / 2 **per level/semester:** 13 / 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: test
Final exam: oral / written exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student has a good theoretical knowledge of the basics of cytomorphology and general histology. Masters the basic laboratory examination methods used in histology.

Class syllabus:
Introduction to histology, histological technique. Cytology (light and electron microscopy). Epithelial tissues (covering, lining). Supportive and connective tissues (ligaments, cartilage). Blood and hematopoiesis. Muscle tissue (smooth, transverse striated muscle, heart muscle, differential diagnosis). Nervous tissue (neurons, nerve fibers, neuroglia, supporting tissue). Organ systems (microscopic anatomy of the cardiovascular system - heart, arteries, veins, capillaries).

Recommended literature:
Histológia pre poslucháčov biomedicínskej fyziky / Jana Foltinová. Univerzita Komenského, 2012
Histologie / Renate Lullmann Rauch. Grada 2013, ISBN 9788024737294
Langmanova lékařská embryologie / Thomas W. Sadlaer. Grada 2011, ISBN 978802476403
Netters Essential Histology / Wililiam K. Ovalle. Elsevier Saunders 2013, ISBN 9781455706310
Wheater's Functional Histology, A text and colour atlas / Barbara Young. Elsevier 2013, ISBN 9780702047473
Before we are Born / Keith L. Moore. Elsevier 2013, ISBN 9781437720013

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 220					
A	B	C	D	E	FX
14,55	18,64	26,82	23,18	16,82	0,0
Lecturers: prof. MUDr. Štefan Polák, CSc., MUDr. Vanda Rísová, PhD.					
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:	**Course title:**
FMFI-LF.ÚHE/1-BMF-225/00	Histology (2)

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 1 / 2 **per level/semester:** 13 / 26
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: test
Final exam: oral / written exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student has a good theoretical knowledge of the basics of cytomorphology, general histology, microscopic anatomy of organs and human embryogenesis. He masters basic special laboratory examination methods used in histology such as histochemistry, immunohistochemistry, scanning electron microscopy, transmission microscopy, confocal microscopy. The student will gain advanced knowledge of the microscopic structure of the human body, which leads to an understanding of functional processes.

Class syllabus:
Microscopic anatomy of the lymphatic system. Microscopic anatomy of endocrine glands. Microscopic anatomy of the respiratory system. Microscopic anatomy of the digestive system. Microscopic anatomy of the uropoietic system. Microscopic anatomy of male and female genitals. Microscopic anatomy of the skin and additional skin organs. Microscopic anatomy of central and peripheral nervous system organs. Microscopic anatomy of sensory organs. Microscopic anatomy of selected embryological structures.

Recommended literature:
Histológia pre poslucháčov biomedicínskej fyziky / Jana Foltinová. Univerzita Komenského, 2012
Histologie / Renate Lullmann Rauch. Grada 2013, ISBN 9788024737294
Langmanova lékařská embryologie / Thomas W. Sadlaer. Grada 2011, ISBN 978802476403
Netters Essential Histology / Wililiam K. Ovalle. Elsevier Saunders 2013, ISBN 9781455706310
Wheater's Functional Histology, A text and colour atlas / Barbara Young. Elsevier 2013, ISBN 9780702047473

Before we are Born / Keith L. Moore. Elsevier 2013, ISBN 9781437720013Before we are Born / Keith L. Moore. Elsevier 2013, ISBN 9781437720013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 182

A	B	C	D	E	FX
36,26	23,63	17,03	10,99	9,89	2,2

Lecturers: prof. MUDr. Štefan Polák, CSc., Mgr. Michaela Vrabcová, PhD., MUDr. Mária Lorencová, PhD.

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:	**Course title:**
FMFI.KAI/1-MXX-491/15	Integrated Education of People with Disabilities

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 55

A	B	C	D	E	FX
78,18	18,18	1,82	0,0	0,0	1,82

Lecturers: PaedDr. Elena Mendelová, CSc.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-311/15	Introduction to Biophysics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 7

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: solving examples
Final exam: oral / written exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
To show the students how the processes taking place in living organisms can be explained using physics

Class syllabus:
Structure and physical properties of biopolymers - nucleic acids, proteins and polysaccharides. DNA discovery, genes. Biological membranes - structure and function. Physics of nerve impulse generation and generation. Biomechanics, elasticity of biomaterials. Physics of respiration. Physics of blood circulation, space medicine. Biological optics, thermovision. Biological acoustics. Orientation of animals in electromagnetic fields and using ultrasound. Thermodynamics, bioenergetics. Molecular machines and nanobiotechnology. Evolution. Modern physical methods in biophysical research.
Solving physical examples associated with the mechanisms of processes in living organisms.

Recommended literature:
Biophysics : An introduction / Roland Glaser. Heidelberg : Springer, 2012
Biomedical applications of introductory physics / Jack A. Tuszynski, John M. Dixon. Hoboken, N.J. : Wiley, 2002
Elementary biophysics : An introduction / P K Srivastava. Harrow : Alpha Science International, 2005

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 31

A	B	C	D	E	FX
61,29	25,81	0,0	0,0	3,23	9,68

Lecturers: prof. RNDr. Tibor Hianik, DrSc., Mgr. Zuzana Garaiová, 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:	**Course title:**
FMFI-FM.KMn/1-MMN-130/00	Introduction to Management I

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Essay (max. 10%), presentation of the essay (max. 10%), midterm test (max. 15%), active participation in solving case studies, final test (max. 25%), oral exam (max. 40%).
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course the student obtains a comprehensive knowledge of selected areas of management theory and become familiar with the basic procedures for identifying and solving problems in management practice. Course content also focuses on developing managerial skills and abilities of listeners. Students through an individual elaboration of an essay, its presentation followed by discussion and case studies enhance the correct use of terminology of management as a science discipline, expanding their knowledge and improving the skills necessary for further study and management practice.

Class syllabus:
1. Managers and management – management as a process, science, and profession.
2. Management theory development.
3. Organizational culture.
4. Organizational environment.
5. Management in a global environment.
6. Social responsibility and managerial ethics.
7. Managerial decision-making.
8. Foundations of planning.
9. Strategic management.
10. Forecasting.

Recommended literature:
[1] WOJČÁK, E. - RUDY, J. - BAJZÍKOVÁ, Ľ. a kol. Manažment, UK Bratislava, 2017.
[2] PIŠKANIN A. – RUDY J. a kol.: Manažment klasické teórie a moderné trendy, UK Bratislava, 2010.

[3] SEDLÁK M.: Manažment. Iura Edition, Bratislava 2009.
[4] ROBBINS, P. R. - COULTER, M.: Management, Harlow : Pearson education limited, 2018, 14th edition. p 751. ISBN 978-1-292-21583-9
[5] ROBBINS, P. R. - COULTER, M. with contributions by MARTOCCHIO, J. J., KONG, L. K.: Management, Harlow : Pearson education limited, 2016, 13th edition. p. 717 . ISBN 978-1-292-09020-7
[6] Journal of Human Resource Management. ISSN 2453 – 7683-[online] www.jhrm.eu

Languages necessary to complete the course:
Slovak and English language

Notes:

Past grade distribution
Total number of evaluated students: 621

A	B	C	D	E	FX
23,83	21,1	18,36	13,53	18,84	4,35

Lecturers: Mgr. Michaela Poláková, PhD., doc. PhDr. Lukáš Copuš, PhD., doc. Mgr. Jana Fratričová, PhD., Mgr. Juliet Horváthová Suleimanová, PhD., Mgr. Monika Vojteková

Last change: 07.05.2019

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-331/18	Introductory Biostatistics

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: 4.

Educational level: I.

Prerequisites:

Recommended prerequisites:
-

Course requirements:
Preliminary evaluation: homeworks
Final exam: oral / written written and oral exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
On completion of the course, students will gain knowledge of the basic principles of scientific research methodology - they will be able to identify and apply different research types, and research designs. They will master the most commonly used statistical methods for biological and clinical data analysis and be able to work with statistical software and Excel add-ins.

Class syllabus:
Basic principles of scientific research methodology. Probability, random variable and its characteristics, types of probability distributions, basic concepts of applied statistics. Data collection, cleaning, sorting and coding, types, scales of variables, descriptive statistics, summarisation and presentation of data. Point and interval estimates, the concept of statistical hypothesis testing, P-value, interpretation of hypothesis testing results, statistical and biological significance. Analysis of categorical data, proportions, contingency tables, case classification, diagnostic tests. Comparison of sample means, t-tests. Analysis of variance. Nonparametric methods. Correlation and simple linear regression. Introduction to multivariable analysis. Practical part: solving real biomedical problems using statistical software Statsdirect and MS Excel with an add-in programmed in MS Visual Basic® for Application (VBA).

Recommended literature:
Lepš, J., Šmilauer, P. (2016). Biostatistika. Episteme, Nakladatelství JU, České Budějovice, 438 s. ISBN: 978-80-7394-587-9
Waczulíková, I., Slezák, P. (2015). Introductory Biostatistics. Bratislava: Comenius University, 1st Edition. 147 p. ISBN 978-80-223-3938-4.

Somorčík, J., Teplička, I. (2015). Štatistika zrozumiteľne. Bratislava : Enigma, 1. vydanie, 2015, 244 s. ISBN 9788081330421.
Zvárová J. (2011). Základy statistiky pro biomedicínské obory. Praha : Karolinum. 218 p. ISBN 80-7184-786-0
Motulsky, H. (2014). Intuitive Biostatistics. New York : Oxford University Press, 3rd Edition, 2014, 540 p. ISBN 987-0-19-994664-8.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 30

A	B	C	D	E	FX
50,0	36,67	10,0	3,33	0,0	0,0

Lecturers: doc. RNDr. Iveta Waczulíková, PhD.

Last change: 10.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-214/21	Laboratory Methods in Biomedicine

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 1 / 1 **per level/semester:** 13 / 13
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: activity during practical exercises
Final exam: oral + written
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
The graduate of the course will gain theoretical and practical experience in the field of basic biomedical analyzes with emphasis on molecular biology and its importance in the clinic. He/she will gain knowledge basics of biological material processing methods and will experience the work in research laboratory.

Class syllabus:
Rules for working in the laboratory of molecular biomedicine, basic instruments; first aid, blood collection, collection of other biological fluids, their basic processing and storage, pressure measurement; blood count, hemocytometer, blood clotting, samples, blood smears; DNA, RNA isolation, their basic analyzes - electrophoresis, PCR, DNase, RNase activity in body fluids; protein determination, western blot, oxidative stress; basics of working with cell cultures, bacteria, yeasts; basics of working with animals intended for animal experiments; microscopy - live cell imager, fluorescence microscopy

Recommended literature:
https://www.fmed.uniba.sk/fileadmin/lf/sluzby/akademicka_kniznica/PDF/Elektronicke_knihy_LF_UK/LABORATORNE_METODY_I.pdf

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
60,0	20,0	10,0	10,0	0,0	0,0

Lecturers: Mgr. Barbora Konečná, PhD., doc. MUDr. RNDr. Roman Gardlík, PhD.

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:	**Course title:**
FMFI.KAI/1-AIN-406/15	Language and Cognition

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2., 4., 6.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 111

A	B	C	D	E	FX
31,53	25,23	17,12	12,61	6,31	7,21

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 12.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-OZE-271/10	Laser Technique

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: 6.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: presentations on a selected topic
Final exam: oral / written written semestral project
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Acquisition of basic principles of construction of optical quantum generators and amplifiers.

Class syllabus:
Optical resonators, their mirrors and dispersion elements of resonators. Methods of forming laser radiation. Specifics of gas, solid state and semiconductor lasers. Laser pulse shortening methods. Use of lasers in science, industry and medicine.

Recommended literature:
Wilson J., Hawkes J. F. B., Lasers principles and applications, Prentice-hall, N. Jersey 1987
P. Engst, Horák M., Aplikace laserů, SNTL, Praha 1989
available scientific literature

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 27

A	B	C	D	E	FX
81,48	11,11	3,7	3,7	0,0	0,0

Lecturers: RNDr. Pavel Vojtek, CSc.

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:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-116/17	Mathematical Methods in Physics (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KJFB/1-FYZ-116/15

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 764

A	B	C	D	E	FX
30,24	14,53	17,41	14,14	17,02	6,68

Lecturers: RNDr. Radoslav Böhm, PhD.

Last change:

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-117/17	Mathematical Methods in Physics (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KJFB/1-FYZ-117/15

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 299

A	B	C	D	E	FX
25,75	13,71	18,06	18,73	18,39	5,35

Lecturers: RNDr. Radoslav Böhm, PhD.

Last change:

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-113/16	Mechanics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 7

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
For the semester, the student can get 30% (for tests) and the final written exam has a weight of 50%. The student must obtain at least half a point per semester in order to pass the final written exam. Indicative scale: A (100% -91%), B (90% -81%), C (80% -71%), D (70% -61%), E (60% -51%), Fx (50% -0%).
Weight of midterm / final assessment: Midterm assessment 30% / 70% final exam.
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Upon completion of the course, students will become familiar with the basic concepts of mechanics such as mass, energy, momentum, angular momentum, moment of inertia, frequency; they will understand the meaning of equations of motion, they will know how to use conservation laws (momentum, mechanical energy, momentum), gain the ability to solve equations of motion for systems consisting of several points or bodies, they will understand the nature of rotational motions and harmonic motions.

Class syllabus:
Physical quantities and units. Movement in one dimension. Vectors. Movement in two and three dimensions. Laws of motion. Applications of Newton's laws of motion. Scalar product, work of constant and non-constant force. Conservative forces and their potential. Energy conservation law. Momentum of the system consisting of several mass points, center of gravity, the law of conservation of momentum. Rotational motion, angular velocity, angular acceleration. Angular momentum of the system consisting of several mass points, the law of its preservation. Inertia tensor. Newton's law for simple rotational motion. Equilibrium conditions. Harmonic oscillator. Damped harmonic oscillator, resonance. Statics and dynamics of fluids (Archimedes' law, Pascal's law, continuity equation, Bernoulli's equation).

Recommended literature:
Fyzika část 1. Mechanika : Vysokoškolská učebnice obecnéfyziky / David Halliday, Robert Resnick, Jearl Walker ; přeložili Jana Musilová ... [et al.]. Brno : Vysoké učení technické VUTIUM, 2000 Fyzika pre študujúcich na vysokých školách technických : 1 : mechanika,

akustika, termika / Dionýz Ilkovič. Bratislava: Alfa, 1972 Všeobecná fyzika : 1 : mechanika a molekulová fyzika / Štefan Veis, Ján Maďar, Viktor Martišovitš. Bratislava : Alfa, 1978. Electronic texts and presentations on the subject's website

Languages necessary to complete the course:

Notes:

Past grade distribution

Total number of evaluated students: 606

A	B	C	D	E	FX
20,63	14,69	12,71	8,75	20,3	22,94

Lecturers: RNDr. Radoslav Böhm, PhD., doc. RNDr. Ivan Sýkora, PhD.

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-LF.ÚLBG/1-BMF-125/00	Medical Biology

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous evaluation:
100% participation in practical trainings
Preparation of 2 seminar papers
Test: 2 continuous written tests with 60% pass threshold
Exam: a. written test with 60% pass threshold b. theoretical part - 2 questions (cytology, molecular genetics)
Indicative rating scale: A: 91-100%, B: 81-90%, C: 73-80%, D: 66-72%, E: 60-65%, Fx: 59% and less.
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Learning outcomes:
A student will gain basic information about morphology, physiology, reproduction, genome of prokaryotic and eukaryotic cells, intercellular communication and molecular genetics.
Acquired knowledge:
- morphology, physiology and genome of prokaryotic and eukaryotic cells
- morphology, function and biogenesis of cell organelles - transport of substances into the cell, intercellular spaces and intercellular communication, cellular receptors
- cell reproduction and cell cycle of eukaryotic cells - cell and tissue cultures and their use
- diseases caused by prokaryotic and unicellular organisms, their life cycle and survival strategies
- types of microscopes, their construction and possibilities of use
- basics of the relationship between microorganism and macroorganism
-characterization, classification, genome and reproduction of viruses, mutations and recombination of viruses
- structure, function of nucleic acids, DNA replication, transcription, translation, regulation of proteosynthesis, genetic code, genes of prokaryotic and eukaryotic cells, gene expression, DNA polymorphisms and possibilities of their analysis
- possibilities of DNA transfer and existence of foreign DNA in the cell

- Insertion sequences and transposons, antibiotic resistance (plasmids, vectors, biotechnology, recombination techniques, importance and use of restriction endonucleases, gel electrophoresis)
- extraction and preparation of material for DNA analysis, isolation of nucleic acids
- overview of basic methods used in molecular genetics and possibilities of their use in medical practice, amplification and DNA sequencing
Acquired skills:
- practical use of microscopic technique (light microscope)
- production of native and simple fixed microscopic slides
- culturing eukaryotic cells and tissues in vitro
- morphological diagnosis of selected bacteria and parasitic protozoa
- use of selected methods of molecular genetics
- isolation, incubation, storage of biological material, isolation of DNA from tissue, gel separation of DNA fragments, DNA quantification, cleavage, blotting, denaturation and renaturation of DNA.

Class syllabus:
The cell as a basic building and functional unit of any living organism: morphology, cell surfaces, nucleus, nucleolus, mitochondria, endoplasmic reticulum, ribosomes, Golgi complex, lysosomes, cytoskeleton. Intercellular spaces and intercellular communication. Substance transport - glycocalyx, membrane receptors. Cell cycle: amitosis, mitosis (mitotic apparatus, endomitosis). Cell and tissue cultivations. In vitro cell culture conditions, culture process, regenerative medicine. Viruses: genome, reproduction, mutations and recombination, oncogenic viruses and acutely transforming viruses. Prokaryotic cells - morphology, structure, genome. Parasexual process in bacteria, CRISPR/Cas system. Differences between prokaryotes, eukaryotes and protists: Molecular biology: structure of DNA and RNA, denaturation and renaturation of DNA, DNA replication, transcription, translation, regulation of proteosynthesis and posttranslational modifications, genetic code. Genes of prokaryotic and eukaryotic cells, insertion sequences and transposons, antibiotic resistance (plasmids, recombinant techniques, vectors). DNA analysis and the application of molecular biology in medical practice.

Recommended literature:
Repiská Vanda, Böhmer Daniel, Danišovič Ľuboš, Klimová Daniela: Medical biology and molecular genetics. Bratislava: Comenius University Bratislava, 2020. - 306 p. ISBN 978-80-223-4984-0
Nussbaum, R.L., McInnes, R.R., Willard, H.F.:Thompson & Thompson.Genetics in medicine. 8th edition. Elsevier, Philadelphia. 2016; 546 p.
Alberts, B., et al. Molecular biology of cell. 6th edition. Garland Science, New York. 2015; 1464 p.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 264

A	B	C	D	E	FX
51,14	11,36	15,91	9,85	10,98	0,76

Lecturers: prof. RNDr. Vanda Repiská, PhD., doc. MUDr. Daniel Böhmer, 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:	**Course title:**
FMFI-LF.IÚ/1-BMF-330/15	Medical Immunology

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: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: none
Final exam: oral / written
Written MCQ test (multiple choice questions) - the student must obtain a min. 70% so that he/she can proceed to the final oral exam (within which the student answers 3 questions).
If remote teaching is necessary, the exam takes place in the form of an online test (min. 70%).
Indicative evaluation scale: A 90 %, B 85 %, C 80 %, D 75 %, E 70 %
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Knowledge: The student acquires general knowledge (regarding tissues, organs, cells, mediators, immune system reactions) and clinical immunology (allergies, autoimmunity, transplantation, hypersensitivity reactions, inflammation, sepsis, immunodeficiency conditions, AIDS, ...). He/she should understand in basic aspects, the role of the immune system in the pathogenesis of various diseases. He/she gets knowledge of the cooperation of the immune system with other systems such as nervous and endocrine system and connection with the psyche (psycho-neuro-endocrine-immune supersystem) – a holistic view.
Cognitive skills: 1. Understanding the role of the immune system in the pathogenesis of various diseases. 2. Ability to recognize conditions of an anaphylactic shock, serum sickness, pseudoallergy that may accompany MRI and CT examinations after administration of gadolinium or radiocontrast agents.

Class syllabus:
Forms of the immune response, an overview of immune mechanisms. Cells of the immune system, primary and secondary lymphoid organs. Antigens. Antibodies; structure and properties. Biological role and clinical significance of antibodies. Monoclonal antibodies.
Complement system. Complement system disorders. Phagocytosis. Disorders of phagocytosis. PAMPs, DAMPs, PRR. Lymphocytes; characteristics, division, biological significance. Membrane antigens. HLA-complex - structure, function, biological and medical significance.
Cytokines, properties and division of cytokines. The role of cytokines in the development and regulation of the immune response and inflammation. Polarization of the immune response.

Overview of hypersensitivity reactions. Allergy. Atopy, anaphylaxis. Anaphylactic shock, anaphylactoid shock, serum sickness. Physiological and pathological autoimmunity. Autoimmune diseases - causes, overview. Basics of serological methods. Laboratory diagnostics of autoimmune diseases.
Immunodeficiencies - primary, secondary. HIV infection / AIDS. Laboratory diagnosis of HIV infection.

Recommended literature:

Buc M. Základná a klinická imunológia pre študentov zubného lekárstva. Bratislava, Univerzita Komenského 2010, ISBN 978-80-223-2312-3.
Buc M., Bucová M. Základná a klinická imunológia pre ošetrovateľstvo a iné nelekárske odbory, 2006, ISBN 80-223-2151-6.
Hořejší Václav a kol. Základy imunologie, 6., aktualizované vydání. Triton, Praha 2017, ISBN 978-80-7553-250-3.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 84

A	B	C	D	E	FX
22,62	19,05	17,86	5,95	25,0	9,52

Lecturers: doc. RNDr. Vladimíra Ďurmanová, PhD., doc. Mgr. Ivana Shawkatová, PhD., prof. MUDr. Milan Buc, DrSc., doc. MUDr. Mária Bucová, CSc., MUDr. Zuzana Párnická, PhD., MUDr. Juraj Javor, 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:	**Course title:**
FMFI.KJFB/1-BMF-531/15	Medical Instruments

Educational activities:
Type of activities: lecture / excursion
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: 6.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 52

A	B	C	D	E	FX
98,08	1,92	0,0	0,0	0,0	0,0

Lecturers: doc. RNDr. Martin Kopáni, PhD., doc. RNDr. Iveta Waczulíková, PhD., 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:	**Course title:**
FMFI-LF.MÚ/1-BMF-325/15	Medical Microbiology

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: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: not applied
Final exam: written and oral
Written test - indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Oral examination: 2 oral questions
The overall evaluation of the exam will be determined as the average of the written and oral examination results.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Basic theoretical knowledge on the properties of medically significant microorganisms (bacteria, viruses, micromycetes, protozoal parasites and parasitic worms) and their interactions with the humans; information on the pathogenicity and virulence of micro-organisms; the origin, spread and development of infectious diseases and ways how to combat microorganisms; an overview of the most important microbial diseases in humans and the basic principles of their microbiological laboratory diagnostics.

Class syllabus:
Microorganisms and humans. Obligatory and opportunistic pathogens. Development and course of microbial diseases. Human microbiota of the skin and mucosal surfaces. Exogenous and endogenous infections. Zoonoses and anthroponoses. Nosocomial infections. Basic characteristics of bacteria (morphology, physiology, genetics, virulence factors, biofilm formation and persistence). Overview of bacterial agents of infectious diseases; the most important groups of medically significant bacteria. Characteristics of viruses, structure of the viral particle. Classification of viruses. Replication of viruses. Viral infection at the level of the cell and the organism. Antiviral drugs. Overview of the medically important DNA and RNA viruses. Prions. Morphology, physiology and virulence factors of mycotical infectious agents. The most important causative agents of human mycoses. Basic properties of parasitic protozoa and parasitic worms. The most important causative agents of human parasitoses. Arthropods as the agents and vectors of infectious diseases. Prevention of infectious diseases spreading. Methods of infectious agents and infectious diseases vectors elimination from the environment of humans. Antimicrobial

drugs. Emergence and spreading of antimicrobial resistance. Active and passive immunization. Immunomodulators of microbial origin. Laboratory diagnostics of microbial diseases.

Recommended literature:
Mikrobiologie pro studenty zdravotnických oborů; 2. doplněné a přepracované vydání / Jiří Schindler. Grada, Praha, 2014

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: 83

A	B	C	D	E	FX
31,33	26,51	18,07	8,43	6,02	9,64

Lecturers: doc. RNDr. Lívia Slobodníková, CSc.

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:	**Course title:**
FMFI-LF.ÚCJ/1-BMF-130/00	Medical Terminology in Latin

Educational activities:
Type of activities: lecture / seminar
Number of hours:
per week: 1 / 2 **per level/semester:** 13 / 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Úvod do štúdia latinského jazyka. I. latinská deklinácia - substantíva feminína, adjektíva. II. latinská deklinácia, substantíva maskulína a feminína, adjektíva. III. deklinácia, konzonantické kmene, neutrá. III. deklinácia vokalické kmene. IV. deklinácia u-kmene. V. deklinácia e-kmene. Grécke substantíva III. deklinácie. Adjektíva III. deklinácie. Stupňovanie adjektív. Latinské základné a radové číslovky. Sloveso. Latinské mená farmaceutických prípravkov. Latinské prefixy. Grécke , latinské sufixy, kompozitá, hybridné slová. Proces slovotvorby a kompozície.

Recommended literature:
Bujalková, M. – Šimon, F.: Terminologia Medica Latina, Osveta, Martin, 2015, 202 s.
Ivanová, A.: Cursus Latinus Medicinalis (Úvod do štúdia latinskej terminológie), Bratislava UK, 2006, 265 s.
Kábrt, J.: Lexicon Medicum, Praha, 1995.
Kábrt, J., Valach, V.: Stručný lekársky slovník, Vydavateľstvo Osveta, Martin, 1965, 1968, 1999.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 260

A	B	C	D	E	FX
21,54	31,15	19,23	15,77	11,92	0,38

Lecturers: PhDr. Tomáš Hamar, PhD., Ing. Janka Bábelová, PhD., Mgr. Radoslav Ďurajka, PhD., Mgr. Ivan Lábaj, PhD., PhDr. Beata Ricziová, Mgr. Angela Škovierová, PhD., Mgr. Eva Taranová, PhD., Mgr. Oľga Vaneková, PhD.

Last change: 30.09.2016

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
PriF-FMFI.KI/2-AIN-501/00	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: 5.

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:	**Course title:**
FMFI-LF.ÚLBG/1-BMF-315/00	Molecular Biology

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: 6.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: 100 % lecture attendance
Final exam: a. test with pass threshold 60 %
b. theoretical part – 2 questions (human genetics)
Indicative evaluation scale: A: 91 - 100 %, B: 81 – 90 %, C: 73 – 80 %, D: 66 – 72 %, E: 60 – 65 %, Fx: 59 % and less
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
A student will gain detailed knowledge about the Human Genome Project, about the genetics of normal and pathological human traits and their diagnostics, about the regulation and deregulation of the cell cycle.
Acquired knowledge:
- organization of the human genome: types of DNA, gene structure, homeoboxes and homeodomains, DNA - histone complex, Human genome project and its significance - chromosome basis of inheritance, chromosome structure, nomenclature, identification techniques
- meiosis, differences between spermiogenesis and oogenesis, abnormalities of cell division
- molecular mechanisms of cell cycle regulation/deregulation and their consequences
- molecular basis of carcinogenesis
- oncogenes, their function in the organism
- mutations of oncogenes, relation to malignancy
- biology of the most common types of tumours: breast, prostate and ovarian cancer, gestational trophoblastic disease, familial cancer
- tumour suppressor genes - their function and nature of mutations
- cell death and apoptosis
- mutagenesis, classification and basic characteristics of mutagens, repair mechanisms - syndromes of increased spontaneous chromosomal instability
- gene therapy
- malignancies associated with a typical chromosomal rearrangement

- basic methods of human genetics (gemelological method, genealogical method, population genetics) - monogenic diseases (autosomal dominant, codominant and recessive inheritance, X-chromosome-linked inheritance)
- multifactorial inheritance of quantitative and qualitative features - normal variability - pathological conditions with multifactorial type of heredity, congenital malformations, diseases of civilization, theory of threshold effect, predisposition to the so-called diseases of civilization, possibilities of prenatal diagnostics
- traditional cytogenetics (in interphase and mitosis) and molecular cytogenetics
- chromosome aberrations in humans (numerical, structural), mechanism of their origin, frequencies and types of the most common chromosomal aberrations, risk of their recurrence, aberrations of sex chromosomes X and Y and the effect of gene dose, mosaicism the incidence of congenital malformations in the population of miscarriages, and neonates, prenatal genetic diagnosis and prognosis
- molecular basis of embryogenesis, role of apoptosis
- Introduction to developmental genetics
- teratogenesis, basic characteristics, mechanism of development, possibilities of differential diagnostics

Class syllabus:

Chromosomal basis of inheritance: chromosome structure, nomenclature, identification techniques. Meiosis. Differences between spermiogenesis and oogenesis. Classification of genetic diseases: monogenic diseases (autosomal dominant, codominant and recessive inheritance, X-chromosome-linked inheritance), gene interactions. Chromosomal aberrations, mechanisms of origin, frequency. X and Y sex chromosome aberrations and gene dose effect. Mosaicism. Organization of the human genome: Human genome project - goals, results and ethical issues associated with the project, types of DNA, gene structure, homeoboxes and homeodomains, DNA - histone complex. Cell cycle regulation. Oncogenesis - molecular basis of carcinogenesis - oncogenes, their function in the organism, c-onc, v-onc. Mutations in oncogenes, relation to malignancy. Tumor suppressor genes - their function, and the nature of mutations. Multistep theory, gene dose effect. DNA repair mechanisms. Syndromes of increased spontaneous chromosome fragility. Malignant diseases associated with a typical chromosomal rearrangement. Molecular mechanisms of cell cycle deregulation. Gene therapy. Epigenetics. Apoptosis. Multifactorial and polygenic inheritance. Normal variability. Qualitative and quantitative traits, methods of genetic analysis. Pathological conditions with multifactorial type of heredity, congenital malformations, diseases of civilization. Threshold effect theory. Predisposition and possibilities of prenatal diagnostics. Mutagenesis, classification and basic characteristics of mutagens. Mutation frequency. Molecular basis of embryogenesis, role of apoptosis in embryogenesis. Teratogenesis - basic characteristics, mechanism of origin, possibilities of differential diagnostics. Occurrence of congenital malformations in the population of miscarriages and in newborns. Prenatal genetic diagnosis and prognosis.

Recommended literature:

Repiská Vanda, Böhmer Daniel, Danišovič Ľuboš, Klimová Daniela: Medical biology and molecular genetics. Bratislava: Comenius University Bratislava, 2020. - 306 p. ISBN 978-80-223-4984-0

Nussbaum, R.L., McInnes, R.R., Willard, H.F.:Thompson & Thompson.Genetics in medicine. 8th edition. Elsevier, Philadelphia. 2016; 546 p.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 151

A	B	C	D	E	FX
60,93	16,56	11,92	5,96	3,97	0,66

Lecturers: prof. RNDr. Vanda Repiská, PhD., doc. MUDr. Daniel Böhmer, 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:	**Course title:**
FMFI.KAFZM/1-OZE-342/15	Physical Analytic Methods

Educational activities:
Type of activities: course
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
45,45	45,45	9,09	0,0	0,0	0,0

Lecturers: doc. RNDr. Karol Hensel, PhD., doc. RNDr. Mário Janda, 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:	**Course title:**
FMFI.KTV/1-MXX-110/00	Physical Education and Sport (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 0

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Orientation in the history of the selected sports discipline, mastering the basic principles of compensation of mostly mental burdens of the individual. Creating a positive, lasting relationship to physical education and sports in the sense of calocagation. Mastering the demands for the development of motor abilities, skills, proper technique of performing individual movements in individual sports, individual game activities in collective sports games.

Class syllabus:
Introduction to the basic history of the selected sport, with the basic principles of compensation of one-sided psychological burden of the individual's body. Development of basic motor skills with a stop to all kinds of endurance, coordination, increasing the level of joint mobility. Training of individual game activities in collective sports games. In individual sports disciplines, practice of basic techniques of individual elements.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 5698

A	B	C	D	E	FX
95,35	1,7	0,12	0,0	0,07	2,76

Lecturers: Mgr. Ladislav Mókus, PaedDr. Dana Mašlejová, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-120/00	Physical Education and Sport (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 0

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practising offensive and defensive combinations and game at modified rules in collective games such as basketball, volleyball, soccer, floorball. Command of elements of higher difficulty in terms of the level of the activity abilities (crawl stroke, breast stroke, butterfly stroke, trampoline jump, aerobic compositions with steps, fitball, elastic gums, paddling on the running water.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 4814

A	B	C	D	E	FX
96,72	1,62	0,1	0,06	0,04	1,45

Lecturers: Mgr. Tomáš Kuchár, PhD., PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-210/00	Physical Education and Sport (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
To practise game combinations, tactical - mechanical elements in basketball, volleyball, soccer, floorball, ice hockey, badminton, competition rules in the sports specialization.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2799

A	B	C	D	E	FX
98,54	0,5	0,11	0,04	0,0	0,82

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 16.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-220/00	Physical Education and Sport (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Preparation for sport championships of the Faculty in the chosen sport at modified rules. The selection of talented students into the teams of the University and Faculty leagues and other faculty sport events.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2518

A	B	C	D	E	FX
98,53	0,16	0,08	0,04	0,0	1,19

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 15.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-310/00	Physical Education and Sport (5)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Preparation and participation of individuals and teams in the system of university sport competitions and sport events.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1864

A	B	C	D	E	FX
98,98	0,38	0,11	0,0	0,0	0,54

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 15.03.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-320/00	Physical Education and Sport (6)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Using the communication in the physical education and sport and organizing the sport championships to achieve expressive motion of the sport and health in a valuable orientation the students.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1630

A	B	C	D	E	FX
98,71	0,37	0,12	0,0	0,0	0,8

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-LF.FyÚ/1-BMF-260/00	Physiology (1)

Educational activities:
Type of activities: lecture / laboratory 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: 4.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: to complete written assignments in practicals / 4 chapter credit tests
Final exam: oral in 3/Z
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Knowledge: To obtain the knowledge of facts and to understand their relationships in the topic of blood physiology, physiology of the excitable tissues, physiology of respiration, physiology of digestive system, nutrition and metabolism. To gain basic knowledge about diseases prevention and healthy lifestyle.
Skills: To acquire skills in recording and evaluation/interpretation of results of selected blood examinations, examinations of the respiratory system, nutritional status and metabolism. To gain basic laboratory skills (use of microscope, pipette), be skilled in basic medical examinations and measurements (determination of hematocrit, blood groups, haemoglobin concentration, count of blood elements, leukogram, nutritional status, metabolic rate, basic spirometry).

Class syllabus:
Blood - blood plasma, blood elements, acid-base balance, osmotic pressure, blood groups, blood clotting and haemostasis, erythropoiesis.
Excitable tissues - receptors, resting membrane potential, action potential, synapses, functional properties of nerve, skeletal and smooth muscle.
Respiration - functions of respiratory system, ventilation and exchange of respiratory gases, lung volumes and capacities, transport of O2 and CO2, breathing and regulation of the blood pH, influence of changes in atmospheric pressure, regulation of breathing.
Digestive system and nutrition - mastication, swallowing, motility of stomach, small and large intestine, functions of digestive juices and their secretion, digestion and absorption of nutrients, function of liver. Basics of nutrition and principles of balanced diet.
Metabolism - energy intake and expenditure, basal and total metabolic rate, energy value of nutrients, energy equivalent and respiratory quotient, oxygen debt, metabolism of carbohydrates, fats, proteins and its regulation.

Recommended literature:

Ostatníková, D. a kol. Základy lekárskej fyziológie. 3. vyd. Bratislava: Univerzita Komenského v Bratislave, 2019. 290 s. ISBN 978-80-223-4744-0.
Javorka, K. a kol. Lekárska fyziológia: učebnica pre lekárske fakulty. 5. preprac. a dopl. vyd. Martin: Osveta, 2021. 769 s. ISBN 978-80-8063-496-4.
Ostatníková, D. a kol. Fyziologické praktikum. Bratislava: Univerzita Komenského, 2021. 236 s. ISBN 978-80-223-5171-3.

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: 181

A	B	C	D	E	FX
43,65	25,97	22,1	5,52	0,55	2,21

Lecturers: prof. MUDr. Daniela Ostatníková, PhD., doc. MUDr. Katarína Babinská, PhD., doc. MUDr. Jana Radošinská, PhD., MUDr. Mária Vidošovičová

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:	**Course title:**
FMFI-LF.FyÚ/1-BMF-320/00	Physiology (2)

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: to complete written assignments in practicals / presentation of seminar work / 4 chapter credit tests
Final exam: oral in 3/Z (2 questions)
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Knowledge: To obtain the knowledge of facts and to understand their relationships in the topic of the cardiovascular physiology, thermoregulation, excretory system, endocrine system and reproduction, senses and central nervous system. To gain basic knowledge about diseases prevention and healthy lifestyle.
Skills: To acquire skills in recording and evaluation/interpretation of results of selected examinations of the cardiovascular system, sensory organs and central nervous system; to gain skills in basic medical examinations and measurements (examination of the arterial pulse, blood pressure, ECG, visual acuity, eyeground, visual field, otoscopy and audiometry, examination of basic reflexes); to get skills in presentation of scientific information and information about diseases prevention and healthy lifestyle in form of short lecture and discussion.

Class syllabus:
Cardiovascular system - physiological properties of the cardiac muscle, cardiac cycle, heart sounds, arterial pulse, electrocardiography, blood flow in vessels, blood pressure, transcapillary exchange, lymph circulation, organ blood circulations.
Thermoregulation - body temperature and its biorhythms, heat production and losses, mechanisms of thermoregulation.
Kidneys - body fluids and their ion-structure, glomerular filtration and tubular processes, acid-base balance, formation of urine, regulation of renal functions.
Endocrine system and reproduction - mechanisms of hormonal action, hierarchy in endocrine system, functions of the hypothalamus - pituitary system, functions of other hormones of endocrine glands.

Senses - classification and function, vision, hearing, taste, olfaction, sense of balance, mechanoception, thermoreception, nociception, proprioception.
Central nervous system - reflex, reflex arch, sensation and perception, regulation of movements and muscle tone, higher nervous functions - memory, emotions, learning, speech.

Recommended literature:

Ostatníková, D. et al. Basics of Medical Physiology. Bratislava: Comenius University, 2021. 298 p. ISBN 978-80-223-5129-4
Ostatníková, D. et al. Laboratory Guide to Medical Physiology. Bratislava: Comenius University, 2018. 210 p. ISBN 978-80-223-4499-9
Silverthorn, D.U. Human Physiology: An Integrated Approach. 8th ed. University of Texas Austin: Pearson, 2019. Global Edition. 975 p. ISBN 978- 01-346-0519-7
Koeppen, B.M. and Stanton, B.A., eds. Berne & Levy Physiology: With Student Consult Online Access. 7th ed. Philadelphia: Elsevier, 2017. 880 p. ISBN 978-03-233-9394-2

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: 163

A	B	C	D	E	FX
22,09	15,34	22,09	14,72	18,4	7,36

Lecturers: prof. MUDr. Daniela Ostatníková, PhD., prof. MUDr. Boris Mravec, PhD., doc. MUDr. Katarína Babinská, PhD., MUDr. Rastislav Važan, PhD., doc. MUDr. Jana Radošinská, 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:	**Course title:**
FMFI.KEF/1-BMF-211/16	Practical I

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: preparation for the practice, writing of reports from individual tasks
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Improvement and use of theoretical knowledge of mechanics and molecular physics, mastering basic physical measurement methods. The student will master the basic habits of independent scientific work in physics research: working with literature, laboratory protocol, obtaining experimental erudition, critical evaluation of measurement and physical interpretation of processed results, written processing of individual physical problems in the form of a paper.

Class syllabus:
In practice, students will gain skills in experimental verification of basic physics laws (Gravitational Law, Hooke's Law, Ideal Gas Law,…), quantitative investigation of physical events (state changes, oscillations, polytropic process,…) and measurement of some basic physical quantities (modulus of elasticity, density, viscosity, speed of sound, humidity, surface tension, gravitational constant, gravitational acceleration,…). Tasks: Density measurement. Measurement of modulus of elasticity. Vibrations of coupled pendulums. Measurement of gravity acceleration. Moment of inertia measurement. Gravitational constant measurement. Heat capacity measurement. Evaporation heat measurement. Determination of dynamic viscosity of fluids. Measurement of dynamic viscosity of liquids by commercial viscometers. The fall of a sphere in a confined gaseous environment. Polytropic process. Determination of surface tension of liquids. Measurement of relative and absolute humidity. Measuring the speed of sound in air. Basic properties of oscillating motion. Some tasks are equipped with sensors allowing measurement and processing of data by computers. For some tasks, conventional measuring instruments and aids are used.

Recommended literature:
Praktikum z mechaniky a molekulovej fyziky / Nadežda Zrubáková, Elena Brežná, Božena Pisoňová. Bratislava : Univerzita Komenského, 2003
Praktikum z mechaniky a molekulovej fyziky / Nadežda Zrubáková, Elena Brežná, Božena

Pisoňová. Bratislava : Univerzita Komenského, 1999

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 68

A	B	C	D	E	FX
91,18	7,35	1,47	0,0	0,0	0,0

Lecturers: prof. RNDr. Melánia Babincová, DrSc., RNDr. Milan Zvarík, 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:	**Course title:**
FMFI.KEF/1-OZE-212/15	Practical II

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 220

A	B	C	D	E	FX
45,0	33,64	15,45	1,82	0,91	3,18

Lecturers: doc. RNDr. Tomáš Roch, Dr. techn., RNDr. Ján Greguš, PhD.

Last change: 01.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KEF/1-OZE-311/15	Practical III

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: protocols from completed exercises
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
By completing the course, students will gain experimental skills with the used instrumentation. They will make sure of the agreement between experiments and theories that clarify them in the realized experiments.

Class syllabus:
Subjective photometry and light detection, lens imaging, dispersion, properties of optical prism spectrograph, interference, two-beam light interference - Newtonian rings, polarization, sucrose optical activity, refractive index, abbe refractive index measurement by refractometer, light absorption examination, diffraction, Fresnel diffraction of light, Fraunhofer diffraction of light on a slit. Experiments in atomic physics (Franck - Hertz experiment, validation of Stefan-Boltzmann's law, range of alpha particles from Am241 in air), nuclear physics (statistical nature of nuclear processes, determination of gamma ray energy, verification of Compton scattering), applied nuclear physics (measurement of air radioactivity).

Recommended literature:
Fyzikálne praktikum IV : Atómová fyzika a detekcia ionizujúceho žiarenia / Matej Florek ... [et al.]. Bratislava : Univerzita Komenského, 1988
Instructions can be found here http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm
Fyzikálne praktikum III : Optika / Zuzana Chorvátová ...[et al.]. Bratislava : Univerzita Komenského, 1984

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 52

A	B	C	D	E	FX
65,38	19,23	7,69	0,0	0,0	7,69

Lecturers: doc. RNDr. Ivan Sýkora, PhD., RNDr. Ján Greguš, PhD., RNDr. Miroslav Ješkovský, PhD.

Last change: 01.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-FYZ-360/00	Practical IV (Atomic and Nuclear Physics)

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practical exercises consist of the Laboratory work in Atom Physics (The Verification of the Franck - Hertz Experiment, The Verification of the Stefan - Botzmann Experiment, Measurement of the flying range Am241 alpha particles in Air,), the Laboratory work in Nuclear Physics (Statistical character of the nuclear changes, Measurement of gamma rays Energy, The Verification of the Compton scattering) and the Laboratory work in Applied Nuclear Physics (Measurement of the radioactivity in Air).

Recommended literature:
Florek.: Fyzikálne praktikum IV. Textbook MFF UK 1988.
Manual to practical exercises on web URL - http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 220

A	B	C	D	E	FX
87,73	10,91	0,45	0,0	0,91	0,0

Lecturers: RNDr. Miroslav Ješkovský, 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:	**Course title:**
FMFI.KJFB/1-OZE-372/10	Practical Training in Radiometry and Spectrometry

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: elaboration of laboratory protocols.
Final evaluation: presentation of the results.
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 80/20

Learning outcomes:
Upon completion of the course, students will gain practical experience in the use of spectrometric and radiometric methods.

Class syllabus:
Study of the basic characteristics of the semiconductor spectrometer. Study of the analysis of a complex gamma spectra. Investigation of the properties of a large area gas counter. Determination of the integral alpha and beta activity of solid samples. Measurement of radon activity concentration by scintillation chamber. Determination of detection efficiency in quenched samples in liquid scintillation technique. Analysis of air samples by semiconductor alpha spectrometer. Determination of radionuclide activity based on dose rate.

Recommended literature:
Gamma and X-Ray spectrometry with semiconductor detectors / Klaus Debertin, Richard G. Helmer. Amsterdam : Elsevier, 1988
Státní úřad pro jadernou bezpečnost: Stanovení radonového indexu pozemku přímým měřením, SÚJB, 2012

Languages necessary to complete the course:
Slovak, English

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. Ivan Sýkora, PhD., doc. RNDr. Monika Müllerová, PhD., Mgr. Ivan Kontuľ, 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:	**Course title:**
FMFI.KAMŠ/1-BMF-227/15	Probability and Statistics

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: I.

Prerequisites: FMFI.KMANM+KJFB/1-BMF-110/15 - Basics of Mathematics (1) and FMFI.KMANM+KJFB/1-BMF-150/15 - Basics of Mathematics (2)

Course requirements:
Continuous assessment: exam, activity in exercises
Exam: written
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
After completing the course students will be able to calculate the probability of random events, deal with discrete and continuous random variables, perform basic descriptive statistics to assess the basic parametric statistical tests.

Class syllabus:
Fundamentals of probability, probability distributions, random samples, introduction to hypothesis testing, one-sample t test, two-sample t test, simple linear regression, goodness of fit test.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 120

A	B	C	D	E	FX
26,67	13,33	16,67	15,83	24,17	3,33

Lecturers: doc. Mgr. Pavol Bokes, PhD., Mgr. Iryna Zabaikina

Last change: 19.10.2016

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-130/16	Programming (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 4 **per level/semester:** 52 / 52
Form of the course: on-site learning

Number of credits: 9

Recommended semester: 1.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KAI/1-AIN-130/13

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 974

A	B	C	D	E	FX
26,8	10,57	9,45	8,62	14,37	30,18

Lecturers: RNDr. Andrej Blaho, PhD., PaedDr. Daniela Bezáková, PhD., PaedDr. Andrea Hrušecká, PhD.

Last change: 07.12.2021

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-310/00	Quantum Mechanics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 7

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Experimental starting points of quantum theory. 2. Phoelectric effect and black body radiation. 3. Introduction of wave mechanics. 4. Schrodinger equation and properties of its solutions. 5. Applications on hydrogen atom and other simple exactly solvable systems. 6. Angular momentum and spin. 8. Approximative methods of quantum mechanics. 9. Perturbation and variational methods. 10. Quantum tunneling and possible aplications of quantum mechanics in chemistry and biology. 11. Epistomological questions of quantum mechanics. 12. Relativistic quantum theory.

Recommended literature:
L. Schiff.: Quantum Mechanics, McGraw Hill, 1985.
A. Davydov, Quantum Mechanics in Biology, Kluwer, 1990.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 157

A	B	C	D	E	FX
49,04	29,3	15,92	3,18	0,64	1,91

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:	**Course title:**
FMFI.KJFB/1-OZE-244/15	Radiometric Measurements

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: 4.

Educational level: I.

Prerequisites:

Course requirements:
Exam: written and oral exam, successful completion of the written part is condition of the oral part.
Share in the overall rating: 80/20.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students will gain a basic theoretical understanding of the characteristics of various detectors and the possibilities of their use for measuring various types of radiation and dosimetric quantities.

Class syllabus:
Allocation of dosimetric methods, allocation of radiometry in protection against ionizing radiation. Basic structure of measuring apparatus. Specifics of radiometric measurements. Block diagram of measuring apparatus. Basic characteristics of detectors. Response function. Time characteristics. Energy resolution. Nuclear radiation detection methods. Principles of detection. Gas, semiconductor and scintillation detectors. Methods for measuring volume activity. Criteria for method selection, sampling, adjustment, optimization of measurement conditions. Concept of low activity, coefficient of quality, detection limits. Background, an overview of methods of reducing it. Analysis of samples containing alpha emitters. Sample thickness problems. Ionization chamber and grid. Determination of beta-emitter activity. "Total beta-activity", selective determination of nuclides, problems of low-energy radiation, internal computers (proportional and scintillation). Determination of detection efficiency for quenching samples. Methods for determining tritium, radiocarbon. Use of Cherenkov radiation for activity measurement. Gamma spectrometry of environmental samples. Scintillation and semiconductor spectrometry methods, energy dependence of detection efficiency, instrument spectrum processing, energy resolution. Spectrometric path, multidetectors systems.

Recommended literature:
Gamma- nd X-Ray spectrometry with semiconductor detectors / Klaus Debertin, Richard G. Helmer. Amsterdam : Elsevier, 1988

Languages necessary to complete the course:
Slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
9,09	27,27	18,18	18,18	27,27	0,0

Lecturers: doc. RNDr. Ivan Sýkora, 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:	**Course title:**
FMFI.KTV/1-UXX-340/00	Recreation Sports in Dialy Routine of Pupils and Students

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
To optimize the daily working programme of the students, the programmes of the sport recreational activities and time-off the students. The sport and health in a value orientation of the students. Using developed elemens in an education physical activity and sport preparation.
The programmes of the sport recreational activities as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 44

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

Lecturers: Mgr. Tomáš Kuchár, PhD.

Last change: 14.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-161/00	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 A1 (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:	**Course title:**
FMFI.KJP/1-MXX-162/00	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 A1 (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: 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:	**Course title:**
FMFI.KJP/1-MXX-261/00	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 A2 (Ольга Долматова, Екатерина Новачац) a 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:	**Course title:**
FMFI.KJP/1-MXX-262/00	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 A2 (Ольга Долматова, Екатерина Новачац) a 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:	**Course title:**
FMFI.KAI/2-IKVa-192/19	Science, Technology and Humanity: Opportunities and Risks

Educational activities:
Type of activities: seminar
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:
Semestral evaluation: active participation
Final evaluation: essay
Weight of the final evaluation: 60%
To achieve an A, 90% is needed, for B at least 80%, for C 70%, for D, 60% and for an E, at least 50% of overall assessment.

Learning outcomes:
The students will gain awareness of the contemporary and potential future challenges posed by scientific and technological innovations and their impact on human behaviour, culture and society.

Class syllabus:
Big data: privacy, politics and power,
Internet of things, it usefulness and threats,
Assistant AI and its place in future society,
Job market and inequality,
Enhancements and human rights and the right to change self and others,
Initiatives for responsible research,
Artificial minds,
Hybridization between species and between AI and organic minds,
Future of minds and trans-humanism,
Artificial emotional intelligence,
An after human era.

Recommended literature:
- S. Russell: Human compatible. Artificial intelligence and the problem of control. Viking, 2019.
- J. Havens: Heartificial intelligence. Embracing our humanity to maximize machines. Penguin, 2016.
- P. Boddington: Towards a code of ethics for artificial intelligence. Springer, 2017.
- M. Shanahan: The technological singularity. MIT Press, 2015.

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

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 48

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

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

Last change: 28.02.2020

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-171/20	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-priebezneho-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 sylabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1).

Recommended literature:
Krížom- 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:	**Course title:**
FMFI.KJP/1-MXX-172/20	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-priebezneho-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 sylabus 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:
Krížom- 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:	**Course title:**
FMFI.KJP/1-MXX-271/20	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-priebezneho-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 sylabus 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:
Krížom-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:	**Course title:**
FMFI.KJP/1-MXX-272/20	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-priebezneho-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 sylabus 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:
Krížom-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:	**Course title:**
FMFI.KDMFI/1-INF-175/00	Social Aspects of Informatics

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KDMFI/1-UXX-332/10 and FMFI.KZVI/1-UXX-333/10

Course requirements:
Three essays submittied during the semester, each for 15 points. Grades: A 41-45 points, B 36-40, C 31-35, D 26-30, E 21-25.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be motivated to think about the impact of information and communication technologies on our lives. Students will be familiar with historical perspective of this impact.

Class syllabus:
New ICT are developed and improved very rapidly. They are becoming an invisible part of our everyday life. We try to look at changes introduced by ICT, what positive they are introducing and what the risks are too. We try to analyse different areas of society: education system, medical care, arts, business, finance, manufacturing, etc. Especially we deal with Slovak copyright law and computer crime.

Recommended literature:
Abelson,Ledeen, Lewis, BlownTo Bits, Addison Wesley 2008, www.bitsbook.com
Materials shared at the course website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1809

A	B	C	D	E	FX
69,04	8,68	4,37	11,06	3,04	3,81

Lecturers: RNDr. Michal Winczer, 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:	**Course title:**
FMFI.KTV/1-MXX-115/15	Sports in Nature (1)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%.
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 227

A	B	C	D	E	FX
99,56	0,0	0,44	0,0	0,0	0,0

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

Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-215/15	Sports in Nature (2)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide sports equipment.

Past grade distribution
Total number of evaluated students: 194

A	B	C	D	E	FX
94,33	0,0	0,0	0,0	0,0	5,67

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

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-216/18	Sports in Nature (3)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 3.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-151/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 19

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

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

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-217/18	Sports in Nature (4)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 4.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-152/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide material equipment.

Past grade distribution
Total number of evaluated students: 18

A	B	C	D	E	FX
88,89	0,0	0,0	0,0	0,0	11,11

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

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-133/18	Supplementary English Course (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 credit - ongoing evaluationMinimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course.A 100-93 %B 92-85 %C 84-77 %D 76-70 %E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form.
Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998
Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 25

A	B	C	D	E	FX
52,0	24,0	8,0	0,0	8,0	8,0

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 17.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-134/18	Supplementary English Course (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 ENcredit - ongoing evaluation Minimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course. A 100-93 % B 92-85 % C 84-77 % D 76-70 % E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form. Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998 Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 26

A	B	C	D	E	FX
57,69	15,38	0,0	11,54	3,85	11,54

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 17.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-167/15	Text and Data Sets Processing

Educational activities:
Type of activities: course
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: I.

Prerequisites:

Course requirements:
Preliminary evaluation: homeworks
Final exam: practice
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 work with the advanced features of the available spreadsheets processors, text editors and presentation programs as well as the basics of database systems.

Class syllabus:
Text formatting, use of styles, document division (paragraphs, sections), creation of content, registers, and bibliographies, work with objects and fields, macros. Cell addressing, filtering, sorting and formatting of data, graphing, trend interpolations, conditional calculations, database and search functions, special mathematical methods, data analysis. Presentation formatting, use of templates and themes, presentation effects, comments. Introduction to database systems, table records processing, relational databases and queries, forms, report creation. Applications on examples from biomedical physics and biophysics.

Recommended literature:
Excel pokročilé nástroje funkce, databáze, kontingenční tabulky, prezentace, příklady / Marek Laurenčík. Praha: Grada, 2016
Access 2013 podrobný průvodce / Slavoj Písek. Praha: Grada, 2013
Online príručka a školenia dostupné na: https://support.microsoft.com/sk-sk

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 70

A	B	C	D	E	FX
77,14	18,57	4,29	0,0	0,0	0,0

Lecturers: doc. RNDr. Iveta Waczulíková, PhD., RNDr. Milan Zvarík, PhD.

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:	**Course title:**
FMFI.KJFB/1-BMF-351/15	Thermodynamics and Statistical Physics

Educational activities:
Type of activities: course
Number of hours:
per week: 5 **per level/semester:** 65
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: individual work - project (30 %)
Final exam: written and oral (70 %)
Indicative evaluation scale: A (100 % -91 %), B (90 % -81 %), C (80 % -71 %), D (70 % -61 %) , E (60 % -51 %), Fx (50 % -0 %).
Scale of assessment (preliminary/final): 30/70
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
After the course, students are able to use the principles and methods of thermodynamics and statistical physics in practice.

Class syllabus:
Mathematiical introduction, probability and statistics. First law of thermodynamics. Second law of thermodynamics. Heat engines. Entropy from thermodynamics point of view. Ideal gas. Statistics of system of spins. Statistics of particles in a box. Termal contact between physical systems. System in termal contact with reservoir. Canonical distribution. Paramagnetism. Curie's law. Mean energy of an ideal gas of monoatomic molecules. Entropy change at low heat transfer, entropy measurement principle. Statistical physics of classical particles (concept of state and number of available states for the classical system, canonical distribution in the classical approximation, equipartition law, specific heat capacities). Thermal and diffusion contact between systems (thermal and diffusion equilibrium conditions, chemical potential, large canonical distribution). Quantum ideal gases (Fermi and Bose statistics. Quantum ideal gas in the classical limit. Boltzmann distribution. Barometric formula, chemical reactions, statistics of conductivity electrons in metal. Fermi energy of degenerate gas. Phase equilibrium and phase transitions. Transfer phenomena.

Recommended literature:
Statistická fyzika / Jozef Kvasnica. Praha : Academia, 1983 Štatistická fyzika / Rudolf Zajac, Ján Pišút. Bratislava : Univerzita Komenského, 1995 Termodynamika a štatistická fyzika : Zbierka úloh / František Čulík, Rudolf Zajac. Bratislava : Univerzita Komenského, 1985 Úvod

do štatistickej fyziky a termodynamiky / Milan Noga, František Čulík. Bratislava : Univerzita Komenského, 1975

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 82

A	B	C	D	E	FX
28,05	18,29	24,39	17,07	10,98	1,22

Lecturers: prof. RNDr. Stanislav Tokár, DrSc., RNDr. Radoslav Böhm, PhD., Mgr. Pavol Bartoš, PhD.

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Approved by: