Course descriptions

TABLE OF CONTENTS

1. 2-FBF-145/00 Acoustics Fundamentals....3
2. 2-FBF-223/00 Application Programs in Biophysics....4
3. 2-FBF-132/15 Application of the Quantum Chemistry and Molecular Dynamics Methods to Molecular Systems....5
4. 2-FBF-122/00 Atomic and Molecular Collisions....6
5. 2-FBM-124/00 Basic Applications of Optical Spectrometry....7
6. 2-FBM-121/00 Basics of MR Spektrometry and Tomography....9
7. 2-FBF-202/00 Bioenergetics....10
8. 2-FBM-131/00 Biomedical Application of Magnetic Resonance....12
9. 2-FBF-143/15 Biosensors and Nanotechnologies....13
10. 2-FBF-224/00 Colloids and Surfactants....14
11. 2-FBF-911/15 Diploma Thesis....15
12. 2-FBF-991/15 Diploma Thesis Defense **(state exam)**....16
13. 2-FBF-920/00 Diploma Thesis Seminar (1)....17
14. 2-FBF-921/00 Diploma Thesis Seminar (2)....18
15. 1-MXX-233/13 English Conversation Course (1)....19
16. 1-MXX-234/13 English Conversation Course (2)....20
17. 2-FBF-953/15 Experimental Methods in Biophysics and Chemical Physics **(state exam)**....21
18. 2-FBF-105/00 Experimental Methods in Biophysics and Chemical Physics (1)....22
19. 2-FBF-106/00 Experimental Methods in Biophysics and Chemical Physics (2)....24
20. 2-FBF-201/00 Field Practice....26
21. 1-MXX-141/00 French Language (1)....27
22. 1-MXX-142/00 French Language (2)....28
23. 1-MXX-241/00 French Language (3)....29
24. 1-MXX-242/00 French Language (4)....30
25. 2-FBF-952/15 General Biophysics and Chemical Physics **(state exam)**....31
26. 1-MXX-151/00 German Language (1)....32
27. 1-MXX-152/00 German Language (2)....33
28. 1-MXX-251/00 German Language (3)....34
29. 1-MXX-252/00 German Language (4)....35
30. 2-FBF-140/00 Introduction to Biomechanics....36
31. 2-FBF-150/15 Introduction to General Biology....37
32. 2-FOL-219/15 Lasers and Optical Fibers in Medicine....38
33. 2-FBF-146/00 Liposomes in Biophysics and Medicine....39
34. 2-FBM-107/00 Mathematical Modelling of Compound Biosystems....40
35. 2-FBF-121/00 Membrane Biophysics....42
36. 1-BIN-301/15 Methods in Bioinformatics....44
37. 2-FBM-135/00 Methods of Biosignal Processing and Medical Imaging Computer Graphic (1)....46
38. 2-FBM-136/00 Methods of Biosignal Processing and Medical Imaging Computer Graphic (2)....48
39. 2-FBF-120/00 Molecular Biophysics....50
40. 2-FBF-226/15 Molecular Dynamics Simulations....52
41. 2-FBF-221/00 Multiparticle Techniques in Chemical Physics....53
42. 2-FBF-107/15 Organic Chemistry and Biochemistry....55
43. 2-FBM-213/00 Photobiophysics and Phototherapy....56
44. 2-FBF-102/00 Physical Chemistry and Electrochemistry....58

45. 2-MXX-110/00 Physical Education and Sport (1)..... 60
46. 2-MXX-120/00 Physical Education and Sport (2)..... 61
47. 2-MXX-210/00 Physical Education and Sport (3)..... 62
48. 2-MXX-220/00 Physical Education and Sport (4)..... 63
49. 2-FBF-142/00 Physical Mechanisms of the Processes in Human Organism.....64
50. 2-FBF-222/00 Physics of Complex Systems.....65
51. 2-FBM-206/15 Planning and Assessment of Experiments with Applications in Biomedicine and Biophysics..... 66
52. 2-FBF-108/15 Quantum Theory of Molecules.....67
53. 2-FBM-141/00 Radiation Biophysics.....68
54. 1-MXX-161/00 Russian Language (1)..... 69
55. 1-MXX-162/00 Russian Language (2)..... 70
56. 1-MXX-261/00 Russian Language (3)..... 71
57. 1-MXX-262/00 Russian Language (4)..... 72
58. 2-FBF-125/15 Semester Project.....73
59. 2-FBF-111/00 Special Practical (1)..... 74
60. 2-FBF-112/00 Special Practical (2)..... 76
61. 2-FBF-115/00 Special Seminar (1).....78
62. 2-FBF-225/15 Special Seminar (2).....79
63. 1-MXX-115/15 Sports in Nature (1)..... 80
64. 1-MXX-115/15 Sports in Nature (1)..... 81
65. 1-MXX-215/15 Sports in Nature (2)..... 82
66. 1-MXX-215/15 Sports in Nature (2)..... 83
67. 2-FBF-141/11 Theoretical Fundamentals of Molecular Spectroscopy.....84
68. 2-FBF-130/15 Theory of Intermolecular Systems.....85

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-145/00	Acoustics Fundamentals

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Acoustic waves propagation in solid environment. 2. Acoustic wave sound velocity propagation relation to the density and compressibility. 3. Piezoelectric phenomenon. 4. Acoustic sensors piezoelectric phenomenon utilization. Sauerbrey equation. 5. Pulse and resonance principle of ultrasound velocity and absorption measurement. 6. Ultrasound velocimetry. 7. Ultrasound velocimetry utilization for study of thermodynamic and mechanical properties of biomembranes and biopolymers. 8. Ultrasound spectroscopy. 9. Ultrasound spectroscopy utilization for study of physical properties of membranes. 10. Acoustic impedance. 11. Surface acoustic waves. 12. Acoustics utilization in biophysics and medicine.

Recommended literature:
Z. Škvor, Acoustics and Electroacoustics, Academia, Praha, 2001 (in Czech)
D.S. Balantine (Ed) Acoustic Wave Sensors. Theory, design and Physico-Chemical Applications, Academic Press, San Diego, 1997.
M. Thompson, D. Stone, Surface-Launched Acoustic Wave Sensors: Chemical Sensing and Thin-Film Characterization, Wiley, 1997.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 19

A	B	C	D	E	FX
94,74	5,26	0,0	0,0	0,0	0,0

Lecturers: RNDr. Peter Rybár, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-223/00	Application Programs in Biophysics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 28 / 14
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Brief introduction to OS. 2. Procedural programming introduction. 3. Object oriented programming introduction. 4. Programming languages overview. 5. Linear algebraic equation solving. 6. Interpolation and extrapolation. 7. Fast Fourier Transform (FFT). 8. Fourier spectra applications. 9. Statistical data analysis. 10. A/D converters/transducers programming. 11. On-line control of experimental devices. 12. Data acquisition and evaluation.

Recommended literature:
Numerical Recipes in C (http://lib-www.lanl.gov/numerical/bookcpdf.html)
http://en.wikipedia.org/wiki/Object-oriented_programming
http://www.python.org/
http://www.scipy.org/

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 32

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

Lecturers: RNDr. Peter Rybár, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-132/15	Application of the Quantum Chemistry and Molecular Dynamics Methods to Molecular Systems

Educational activities:
Type of activities: seminar
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBF-132/11

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

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: prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc., RNDr. Peter Papp, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-122/00	Atomic and Molecular Collisions

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Potential energy surfaces. 2. Crossing and avoided crossing fo surfaces. 3. LEPS surface. 4. DIM method. 5. Dynamics of collisions- Classical approach. 6. QCT method. 7. Application of the QCT methods. 8. Analysis of results. 9. Quantum mechanical formulation, dynamics of elastic collisions. 10. Inelastic collisions. 11. Reactive collisions. 12. Application of methods to atom - molecular systems.

Recommended literature:
R.D. Levine, R.B. Bernstein, Molecular Reaction Dynamics and Chemical Reactivity, Oxford University Press, Oxford, 1987
W.H. Miller (Ed.), Dynamics of Molecular Collisions, in: Modern Theoretical Chemistry, Vol 1, Vol 2, Plenum Press, 1976.
S. Brandt, H.D. Dahmen, T. Stroh, Interactive Quantum Mechanics, Springer, 2003.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 17

A	B	C	D	E	FX
82,35	5,88	11,76	0,0	0,0	0,0

Lecturers: prof. RNDr. Ján Urban, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-124/00	Basic Applications of Optical Spectrometry

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 28 / 14
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Electromagnetic radiation spectrum. Energetic states (levels) of molecules. Electronic transitions in molecules. Probabilities of absorption and emission, Einstein coefficients. Transition dipole moments. Absorption of UV VIS radiation, Lambert-Bear-Bouguer law. Information contained in absorption spectra, Frank-Condon principle. Techniques of absorption spectrophotometry. Preparation of samples for optical spectrophotometry. Chromophores. Effect of internal factors on absorption spectra. Effect of external factors on absorption spectra. Absorption of linearly polarized light. Applications of absorption spectroscopy. Fundamentals of formation of excited electronic states of molecules. Information contained in fluorescence spectra. Techniques of spectroflourimetry. Properties of electronically excited molecules. Effect of internal factors on fluorescence spectra. Stokes law, law of mirror symmetry. Quantum yield of fluorescence. Kinetics of luminiscence, lifetime of excited state. Fluorophores. Effect of external factors on fluorescence spectra. Fluorescence quenching, fluorescence anisotropy. Fluorescence probes and labels.

Recommended literature:
Nepraš M., Titz M.: Základy teórie elektrónových spekter. SNTL, Praha 1983
Kováč Š., Leško I., Spektrálne metódy v organickej chémii. Alfa, Bratislava 1980
Ferenčík M., Škárka B., a kol.: Biochemické laboratórne metódy. Alfa, Bratislava 1981
Lapčík Ľ., Pelikán P., Čeppan M.: Fotochemické procesy. Alfa, Bratislava 1989
Prosser V. a kol.: Experimentální metody biofyziky. Academia, Praha 1989

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
86,02	9,68	2,15	1,08	1,08	0,0

Lecturers: prof. RNDr. Libuša Šikurová, CSc., RNDr. Marcela Morvová, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-121/00	Basics of MR Spektrometry and Tomography

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
General fundamentals of imaging in clinical practice. Basic terms and physical principles of NMR a EPR. NMR spectrum. Relaxation mechanisms. Relation between high resolution NMR spectra parameters and structure of compounds. Multipulse NMR spectroscopy. 2D NMR spectroscopy. Principles of MR imaging. Image parameters and image contrast. Special imaging techniques, artifacts. Hardware and specific requirements for in-vivo measurements on humans. Localized spectroscopy and spectroscopic imaging (CSI). Practical demonstration of MR imaging and localized spectroscopy.

Recommended literature:
Magnetická rezonančná spektroskopia, kol., Učebné texty k PGŠ, CHTF STU Bratislava, 1998
H. Weis, P. Bořuta, Úvod do magnetickej rezonancie, GOEN, Bratislava, 1998
H. Günther, NMR Spectroscopy: Basic Principles, Concepts, and Applications in Chemistry, 2nd edition. Wiley, Chichester, 1998.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 116

A	B	C	D	E	FX
67,24	20,69	9,48	0,0	2,59	0,0

Lecturers: Ing. Vladimír Mlynárik, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-202/00	Bioenergetics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Introduction into bioenergetics. The first and second law of thermodynamics and biological systems. Gibbs free energy, energy coupling in chemical reactions. 2. Entropy of open thermodynamical systems. 3. Entropy and information. Sense of biological ordering. 4. Krebs cycle and glycolysis. Quantitative bioenergetics, common redox groups in biology. 5. Photosynthesis. 6. Kinetics of enzyme catalysis, Michaelis-Menten equation. Enzyme inhibition and activation (use in medicine). 7. Physics of enzyme catalysis. 8. Substrate phosphorylation. 9. Membrane phosphorylation - chemical hypothesis. Mitchell´s (chemiosmotic) hypothesis, Coupling of ATP-producing and ATP-consuming processes. Conformational hypothesis of the membrane phosphorylation. 11. Transformation energy in a cell as a relaxation procress. 12. Current view on the mechanisms of transformation energy in a cell.

Recommended literature:
T. Hianik, Transfer and conversion of the energy in living systems. Textbook, Comenius University 1984 (in Slovak)
V.P. Skulačev, Exciting ways of bioenergetics, Smena, Bratislava 1985 (in Slovak)
L.A. Blumenfeld. A.N. Tikhonov, Biophysical Theromodynamics of Intracellular Processes. Springer-Verlag, 1994.
D. Harris, Bioenergetics at a Glance, Blackwell, 1995.
D. Nicholls, S. Ferguson, Bioenergetics 2, Academic Press, 1992.
S. Papa, F. Guerrieri, J. Tager (Eds.), Frontiers of Cellular Bioenergetics, Kluwer, 1999.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 37

A	B	C	D	E	FX
89,19	2,7	5,41	0,0	2,7	0,0

Lecturers: doc. RNDr. Iveta Waczulíková, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-131/00	Biomedical Application of Magnetic Resonance

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
i) Basic terms, specific features of NMR in biological tissues and in vivo measurements. ii) Properties of NMR signals in biological tissues. iii) Information on a living tissue obtained by NMR methods. iv) Main issues of in vivo applications and their solutions. v) Degenerative brain diseases studied by 1H/31P NMRS and MRI. vi) Studies of energy processes – glucose transport and metabolism by 31P/13C/1H NMRS – Metabolic control analysis. vii) Degenerative changes in cartilage and bone. viii) Functional imaging of cerebral activity. ix) Studying cancer by 1H/31P NMRS – spectra classification. x) Assessment of tissue vitality in transplantation - relaxometry, NMR spectroscopy.

Recommended literature:
J. Weis, P. Bořuta, Úvod do magnetickej rezonancie, GOEN, Bratislava, 1998.
D. Gadian, Nuclear Magnetic Resonance and its Application to Living Systems, Oxford, 1996

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 67

A	B	C	D	E	FX
91,04	7,46	1,49	0,0	0,0	0,0

Lecturers: RNDr. Marek Chmelík, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-143/15	Biosensors and Nanotechnologies

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Recommended prerequisites:
,

Antirequisites: FMFI.KJFB/2-FBF-143/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 46

A	B	C	D	E	FX
78,26	15,22	6,52	0,0	0,0	0,0

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

Last change: 29.04.2017

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-224/00	Colloids and Surfactants

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 3

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

Lecturers: doc. RNDr. Pavol Vitovič, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-911/15	Diploma Thesis

Educational activities:
Type of activities: independent work
Number of hours:
per week: 16 **per level/semester:** 224
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

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

Lecturers: prof. RNDr. Tibor Hianik, DrSc.

Last change:

Approved by: prof. RNDr. Tibor Hianik, DrSc.

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-991/15	**Course title:** Diploma Thesis Defense
Number of credits: 16	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Tibor Hianik, DrSc.	

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-920/00	Diploma Thesis Seminar (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Presentation and discussion on the data obtained by study of literature regarding the given problem. Presentation and discussion of techniques and methods (experimental and theoretical) to be used in the thesis. Setting particular aims of the diploma thesis.

Recommended literature:
According to the Diploma thesis.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 16

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

Lecturers: prof. RNDr. Libuša Šikurová, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-921/00	Diploma Thesis Seminar (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Presentation of own results achieved during the work on diploma thesis, possibility of delineation of the obtained data, statistical processing of the data. Discussion of the obtained data and its possible applications for further research or practice.

Recommended literature:
According to the Diploma thesis

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 16

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

Lecturers: prof. RNDr. Libuša Šikurová, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3.

Educational level: I., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
The content of the course is general English.
The language level is B2/C1 (Upper-Intermediate/Lower Advanced).

Recommended literature:
Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals
Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 135

A	B	C	D	E	FX
58,52	18,52	9,63	2,22	1,48	9,63

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2., 4.

Educational level: I., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
The course is a follow-up to the Conversation Course in English (1). The content of the course is general English.
The language level is B2/C1 (Upper-Intermediate/Lower Advanced).

Recommended literature:
Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals
Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 62

A	B	C	D	E	FX
67,74	19,35	4,84	0,0	0,0	8,06

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-953/15	**Course title:** Experimental Methods in Biophysics and Chemical Physics
Number of credits: 3	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Tibor Hianik, DrSc.	

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-105/00	Experimental Methods in Biophysics and Chemical Physics (1)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Light microscopy. 2. Electron microscopy. 3. X-ray crystallography for determining the structure of minerals and biopolymers. 4. Proteopathies: methods for studying and diagnosing protein conformational diseases. 5. Fundamentals of EPR. 6. Application of EPR in biophysics. 7. Fundamentals of NMR. 8. Application of NMR in biophysics. Computer tomography. Magnetic resonance imaging. 9. Bioelectrochemical methods for biomembranes. Measurement of membran conductance, patch clamp. 10. Ion selective electrodes, Biosenzors. 11. Electrophoresis. Chromatographic methods. 12. Molecular acoustics and sonography.

Recommended literature:
B. Nölting, Methods in Modern Biophysics, Springer, 2005
G.G. Hammes, Spectroscopy for Biological Sciences, Wiley, 2005
I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007
E. Hoffman, V. Stroobant , Mass Spectrometry. Principles and Applications, Wiley, 2007.
N.E. Jacobsen, NMR Spectroscopy Explained ,Wiley, 2007.
C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980.
W. Gordy, Theory and application of Electron Spin Resonance. Wiley, New York, 1980.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 19

A	B	C	D	E	FX
94,74	0,0	5,26	0,0	0,0	0,0

Lecturers: Mgr. Zuzana Garaiová, PhD., doc. RNDr. Pavol Vitovič, PhD., doc. RNDr. Iveta Waczulíková, PhD., RNDr. Marcela Morvová, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-106/00	Experimental Methods in Biophysics and Chemical Physics (2)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Non-spectral optical methods: refractometry, polarimetry, interferometry. 2. Spectral optical methods: UV-VIS. 3. Application of UV-VIS in biophysics. 4. Fluorescence spectroscopy and method of polarized fluorescence. 5. Application of fluorescence spectroscopy in biophysics. 6. Infrared spectroscopy. 7. Application of infrared spectroscopy in study of biopolymers. 8. Raman spectroscopy. 9. Methods based on light scattering: Flow cytometry, Particle size and shape analysers. 10. Laser spectroscopy. 11. Methods of molecular imaging (AFM, STM, SNOM, SECM). 12. Nanotechnology in biophysics and medicine.

Recommended literature:
B. Nölting, Methods in Modern Biophysics, Springer, 2005
G.G. Hammes, Spectroscopy fo Biological Sceinces, Wiley, 2005
I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007
C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980.
E.R. Menzel, Laser Spectroscopy, Marcel Dekker, New York, 1995.
D.S. Balantine (Ed) Acoustic Wave Sensors. Theory, design and Physico-Chemical Applications, Academic Press, San Diego, 1997.
P.W. Atkins, J. de Paula, Physical Chemistry, Oxford University Press, New York 2002.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 17

A	B	C	D	E	FX
88,24	11,76	0,0	0,0	0,0	0,0

Lecturers: Mgr. Zuzana Garaiová, PhD., doc. RNDr. Pavol Vitovič, PhD., doc. RNDr. Iveta Waczulíková, PhD., RNDr. Marcela Morvová, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-201/00	Field Practice

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

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The student will work on the experimental or theoretical part of diploma thesis during 4 weeks in the laboratory of diploma thesis supervisor or at other laboratory recommended by diploma thesis supervisor.

Recommended literature:
According to reccommendation of practice or diploma thesis supervisor

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 14

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

Lecturers: doc. RNDr. Ivan Haverlík, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

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:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 374

A	B	C	D	E	FX
39,84	22,19	21,66	10,16	2,14	4,01

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of French language (1) and provides courses of essential and intermediate French language.

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 237

A	B	C	D	E	FX
34,18	27,85	21,52	11,39	2,53	2,53

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

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

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
33,33	30,11	23,66	7,53	1,08	4,3

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

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

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008
Zarha Lahmidi: Sciences-techniques.com, ISBN 209-0331186-0, CLE international, 2005

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 63

A	B	C	D	E	FX
31,75	38,1	20,63	3,17	1,59	4,76

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-952/15	**Course title:** General Biophysics and Chemical Physics
Number of credits: 3	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Tibor Hianik, DrSc.	

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

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.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 648

A	B	C	D	E	FX
31,94	29,17	21,3	10,03	2,93	4,63

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The course continues the program of German language (1). German language is taught at three levels: beginner, intermediate, advanced.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 408

A	B	C	D	E	FX
29,17	22,06	23,77	14,95	3,68	6,37

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of German language (2). It provides a course of intermediate and advanced German language.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.
Aus moderner Technik und Naturwissenschaft, 1999, Max Hueber Verlag, D-85737, ISBN 3-19-001629-1

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 148

A	B	C	D	E	FX
38,51	27,03	22,3	6,76	2,7	2,7

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of German language (3). It provides a course of intermediate and advanced German language.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.
Vilma Václavíková: Nemčina pre študentov MFF UK, Vysokoškolský učebný text pre potrebu študentov KJP, č. 9793/1982 C VIII/2, 1983

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 78

A	B	C	D	E	FX
35,9	28,21	14,1	12,82	3,85	5,13

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-140/00	Introduction to Biomechanics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Introduction to the biomechanical concepts. 2. Biomechanics of cell membrane and form of cell. 3. Biomechanics of human tissues in organism. 4. Human locomotion – system of bone muscles. 5. Thermomechanics of muscle contraction. 6. Active motion of joints. 7. Forces on the skeleton. 8. Visco-elestic properties of body liquids. 9. Heart as a pump machine. 10. Hearing biomechanics. 11. Breathing mechanics. 12. Biomechanics of digestion tract.

Recommended literature:
J. Vogel, Biomechanics, Princeton, University Press, 2003.
J. Valenta, Biomechanics, Academia and Kluwer Academic Publishers, 2002.
http://en.wikipedia.org/wiki/Biomechanics

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 88

A	B	C	D	E	FX
87,5	7,95	2,27	2,27	0,0	0,0

Lecturers: prof. RNDr. Melánia Babincová, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-150/15	Introduction to General Biology

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 56 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBF-150/10

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 8

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

Lecturers: prof. RNDr. Melánia Babincová, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FOL-219/15	Lasers and Optical Fibers in Medicine

Educational activities:
Type of activities: lecture
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBM-235/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 4

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

Lecturers: prof. RNDr. Libuša Šikurová, CSc., RNDr. Dušan Chorvát, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-146/00	Liposomes in Biophysics and Medicine

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Structure and properties of lipid bilayers of liposomes. 2. Methods of liposome preparations. 3. Physical properties: ordering of lipid molecules, phase transitions, osmotic properties, permeability. 4. Stability of liposomal structure. 5. Processes of aggregation, fusion and auto-oxidation. 6. Applications in biophysics and medicine. 7. Model systems, cancer chemotherapy, antimicrobial therapy, targeted transport. 8. Methods of efficient drug encapsulation – chemistry and physics. 9. Mechanisms of cell-liposome interaction. 10. Fusion, stable adsorption, endocytosis. 11. Conditions of stability of in the blood – vascular system. 12. Novel structures in liposomal therapy: transferosomes, magnetoliposomes, fullerenosomes.

Recommended literature:
G. Betageri, Liposome Drug Delivery Systems, Technomics Press 2002.
D. Lasic, Liposomes in Gene Delivery, CRC Press 1997.
http://en.wikipedia.org/wiki/Liposome

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 37

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

Lecturers: prof. RNDr. Melánia Babincová, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-107/00	Mathematical Modelling of Compound Biosystems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Essentials of systém analysis. Local and systém approaches. Systém – elements and connections. Interaction of the systém with enviroment. Systém classification. Selective levels. Altitude. Structure and behavior of the systém. Complexity of the systém. State space. Transition process. Stability, equilibrium, systém stationarity. Emmergentity. Adaptation. Homeostasis. Systém self organisation and self reproduction. Macroscopic and mikroscopic approaches. Method of analogy and modeling methods. Mathematical and content modeling. Cybernetical modeling. Models of behavior and models of systém structure.. Models classification. Method of black box. Entropy, negentropy and information. Information transfer systém. The value of information. Quantitative expression of information. The control systems and their classification. Continuous, doscrete and probability modeling. Continuous and discrete models of populations. Models of concurrence. Kolmogorov model. Holling model. Logical models of conditional reflexes. Sandwich model of biomembrane

Recommended literature:
Haverlík I.: Perspectives of Cybernetics, Bratislava, Obzor 1981
Haverlík I. et al.: Informatics I, university textbook, MFF UK
Haverlík I.: Biomathematics and bases of modeling in biophysics and biomedicine physics, university textbook, FMFI UK

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 73

A	B	C	D	E	FX
24,66	28,77	17,81	12,33	16,44	0,0

Lecturers: doc. RNDr. Ivan Haverlík, CSc.

Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-121/00	Membrane Biophysics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Structure of biomembranes. Lipid composition, assymetry and hydration of lipid bilayers. 2. Conformation of hydrocarbon chains and polar head groups of phospholipids. RTG analysis of the membranes. 3. Lipid monolayers and their physical properties. 4. Bilayer lipid membranes (BLM) and supported membranes. 5. Liposomes, application of EPR, NMR and fluorescence spectroscopy to study the biomembranes. 6. Thermodynamic properties of membranes. Phase transition of lipid bilayer. 7. Membrane mechanical properties. 8. Membrane potentials. 9. Electrodiffusion theory of the ion transport across the membranes. Ion channels and carriers. Mechanism of discrete transport of ions. Current-voltage characteristics of ionic channels. 10. Active ionic transport. 11. Protein-lipid interactios. 12. Membrane receptors. Cell signalling.

Recommended literature:
T. Hianik, Basics of Molecular Biophysics, UK, 1987 (in Slovak).
T. Hianik, Structure and physical properties of biomembranes and model membranes, Acta Physica Slovaca, 56 (2006) 687-805
B. Alberts, D. Bray, A. Johnson, J. Lewis, M. Ralf, K. Roberts, P. Walter, Essential Cell Biology, Garland Publishing. Inc, New York, 1998.
G. Cevc and D. Marsh, Phospholipid Bilayers. Physical Principles and Models, John Wiley & Sons, New York, 1987.
A.G. Lee (Ed.), Biomembranes, vol. 1. JAI Press, London, 1995.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 42

A	B	C	D	E	FX
64,29	30,95	4,76	0,0	0,0	0,0

Lecturers: Mgr. Zuzana Garaiová, PhD., prof. RNDr. Tibor Hianik, DrSc.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KI/1-BIN-301/15	Methods in Bioinformatics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:
Homework assignments, group project, written exam
Scale of assessment (preliminary/final): 40/60

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 molecular biology, algorithms and machine learning. Sequencing and assembling genomes. Gene finding. Sequence alignment. Evolutionary models and phylogenetic trees. Comparative genomics. RNA structure. Motif finding and gene expression analysis. Protein structure and function. Selected current topics.
Students of computer science programs will focus on computer science methods and mathematical modeling of the covered problems. 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: 68

A	B	C	D	E	FX
29,41	20,59	25,0	19,12	2,94	2,94

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Vladimír Boža, PhD.
Last change: 08.02.2018
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-135/00	Methods of Biosignal Processing and Medical Imaging Computer Graphic (1)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Image processing:
1. Basic terms, physical principles of image registration, detectors of optical signal
2. Sampling, analog to digital conversion, aliasing, digital and optical resolution
3. Intensity histogram, signal and noise, greyscale transformations, matematical operations
4. Resampling, image transformation, pseudocolor and color spaces,
5. Convolution, point spread function, image bluring and sharpening
6. Fourier transform, digital image filtering
7. Binary operations, edge detection, morphology and segmentation
Data visualization in Iris Explorer:
8. Principles of visualization of multidimensional data, visualization software
9. Slicing of 3D data, application of colormaps, 2D and 3D contours
10. Surface and volumetric rendering of 3D data, visualization of vector fields
11. Geometry processing, animation of virtual 3D models
12. Application of visualization techniques on selected data (microscopy, tomography)

Recommended literature:
S.W. Smith: The Scientist and Engineer's Guide to Digital Signal Processing, Second edition, California Technical Publishing, 1999, (http://www.dspguide.com/pdfbook.htm)
I.N. Bankman: Handbook of Medical Imaging, Processing and Analysis, Academic Press, 2000
IRIS Explorer User's Guide (http://www.nag.co.uk/visual/ie/iecbb/doc/html/nt-ie5-0.htm)

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 121					
A	B	C	D	E	FX
77,69	20,66	1,65	0,0	0,0	0,0
Lecturers: RNDr. Dušan Chorvát, PhD.					
Last change: 02.06.2015					
Approved by: prof. RNDr. Tibor Hianik, DrSc.					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBM-136/00	**Course title:** Methods of Biosignal Processing and Medical Imaging Computer Graphic (2)
Educational activities: **Type of activities:** lecture **Number of hours:** **per week:** 2 **per level/semester:** 28 **Form of the course:** on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: Spracovanie signálov: 1. Types, detection and analogue preprocessing of signal 2. Signal transmission, conversion, digitalisation and recording 3. Signal and noise, frequency analysis, digital and analogue filters 4. Linear and nonlinear systems, superposition, signal waveform analysis 5. Matematical modelling and fitting of complex signals, statistical analysis 6. Convolution, instrument response function, deconvolution techniques 7. Signal synthesis, compression and encoding Aplikácie: 8. Optical microscopy 9. Computer tomography 10. Bioacoustics 11. Electrophysiology 12. Stationary and time-resolved spectroscopy	
Recommended literature: S.W.Smith: The Scientist and Engineer's Guide to Digital Signal Processing, Second edition, California Technical Publishing, 1999, HYPERLINK http://www.dspguide.com/pdfbook.htm J. Dempster: Computer Analysis of Electrophysiological Signals, Biological Techniques, D.Sattelle ed., Academic Press 1993	
Languages necessary to complete the course:	
Notes:	

Past grade distribution Total number of evaluated students: 108					
A	B	C	D	E	FX
85,19	11,11	3,7	0,0	0,0	0,0
Lecturers: RNDr. Dušan Chorvát, PhD.					
Last change: 02.06.2015					
Approved by: prof. RNDr. Tibor Hianik, DrSc.					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FBF-120/00	**Course title:** Molecular Biophysics
Educational activities: **Type of activities:** lecture **Number of hours:** **per week:** 2 **per level/semester:** 28 **Form of the course:** on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: 1. Introduction, historical overview. Structure of proteins, peptide bound, Secondary structure of proteins. 2. Conformation of polypeptide chain. 3D structure of proteins. 3. The typee of interactions in macromolecules. 4. Phase transitions in biopolymers (Globule-Statistical chain). 5. Structure of nucleic acids. 6. Structure of biomembranes and their models. Electron microscopy and X-ray analysis of membranes. 7. Physical properties of the membranes. Membrane electric breakdown, electroporation. 8. Mechanisms of membrane conductivity. Membrane receptors. 9. Phase and membrane theory of exitation. Membrane potential. Aprovement of the membrane theory of Bernstein. 10. Mechanisms of the origin and propagation of nervous impulse. Model of Hodgkin and Huxley. 11. Structure of the muscle and muscle proteins. Electrochemical coupling of muscle contraction. 12. The theory of muscle contraction	
Recommended literature: T. Hianik, Basics of Molecular Biophysics, UK, 1987 (in Slovak). M.B. Jackson, Molecular and Cellular Biophysics, Cambridge University Press, 2006 B. Nölting, Methods in Modern Biophysics, Springer, 2006. T. Hianik, Structure and physical properties of biomembranes and model membranes, Acta Physica Slovaca 56 (2006) 687-805. C.R. Cantor, P.R. Schimmel, Biophysical Chemistry, W.H. Freeman and Company, San Francisco, 1980. B. Alberts, D. Bray, A. Johnson, J. Lewis, M. Ralf, K. Roberts, P. Walter, Essential Cell Biology, Garland Publishing. Inc, New York, 1998.	
Languages necessary to complete the course:	
Notes:	

Past grade distribution Total number of evaluated students: 122					
A	B	C	D	E	FX
46,72	32,79	14,75	5,74	0,0	0,0
Lecturers: prof. RNDr. Tibor Hianik, DrSc.					
Last change: 02.06.2015					
Approved by: prof. RNDr. Tibor Hianik, DrSc.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-226/15	Molecular Dynamics Simulations

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

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

Lecturers: RNDr. Ing. Milan Melicherčík, PhD., prof. RNDr. Ján Urban, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-221/00	Multiparticle Techniques in Chemical Physics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Importance of colloidal systems. Classification of colloids. 2. Structure and characterization of surfactants. 3. Solutes, solvents, organized amphiphilic structures. 4. Solutes thermodynamics. Osmotic pressure. Chemical potential. Viscosity. 5. Forces in colloidal systems. Van der Waals forces. 6. Electrostatic interactions in colloidal systems. 7. Structure and properties of micelles. Critical micellar concentration. Emulsions. 8. Adsorption thermodynamics and isotherms. Physics and chemistry of interfaces and monolayers. 9. Electrical double-layer. Diffusion double layer. Debye-Hückelov model. Gouy-Chapman theory. 10. Stability of colloids. 11. Phases, phase equillibrium, phase diagrams. 12. Methods for studying colloidal systems-zeta potential, electrophoresis, dynamic light scattering, contact angle, wetting.

Recommended literature:
Daoud, M., Williams, C., Lyle, S.: Soft Matter Physics, Springer, 1999.
Evans, F.Wennerström, H.: The Colloidal Domains. Where Physics, Chemistry, Biology, and Technology Meet, Wiley-WHC, 1999.
Hatschek, E.: An introduction to the Physics and Chemistry of Colloids, BiblioBazaar, 2008.
Hiemenz, P., Rajagopalan, R.: Principles of Colloid and Surface Chemistry, Marcel Drekker, 1997.
Israelachvili, J.: Intermolecular and Surface Forces: With application to Colloidal and Biological Systems (Colloid Science), Academic Press, 1992.
Rosen, M.: Surfactants and Interfacial Phenomena, Wiley-Interscience, 2004.
Safran, S., Safran, S.A.: Statistical Thermodynamics of Surfaces, Interfaces, and Membranes, Westview Press, 2003.
Shaw, D.: Introduction to Colloid and Surface Chemistry, Butterworth-Heinemann, 1992.

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 2					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Peter Babinec, CSc.					
Last change: 02.06.2015					
Approved by: prof. RNDr. Tibor Hianik, DrSc.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-107/15	Organic Chemistry and Biochemistry

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 56 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 18

A	B	C	D	E	FX
94,44	5,56	0,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Ján Urban, DrSc., doc. RNDr. Iveta Waczulíková, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-213/00	Photobiophysics and Phototherapy

Educational activities:
Type of activities: lecture
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The field of photobiophysics; Sun radiation penetrating to the Earth; biologically active bands of the electro-magnetic radiation spectrum; chromophores and fluorophores in biological objects; application of electron spectroscopy to the study of biological objects; phototherapy, photosterilization, photodiagnostics; classification of photobiological processes; non-physiological photobiological processes; physiological photobiological processes: photoreception, photosynthesis, bioluminiscence.

Recommended literature:
Š. Kováč, I. Leško, Spektrálne metódy v organickej chémii. Alfa, Bratislava 1980
B. Birks B. (Ed.), Organic Molecular Photophysics, Arrowsmith, Bristol, 1973
G. Britton, The Biochemistry of Natural Pigments, Cambridge University Press, Cambridge, 1983
R.J.H. Clark, R.E. Hester, Biomedical Aplications of Spectroscopy, Wiley, New York,1996
J. Javurek .: Fototerapie biolaserem, Avicenum, Praha, 1995
D. Philips, Chemical mechanisms in photodynamic therapy with phtalocyanines. In: Progress in Reaction Kinetics (Eds.: Kemp T. J., Donovan R.J., Rodgers M. A. J.) Vol. 22, pp. 175-300, 1997

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 70

A	B	C	D	E	FX
95,71	2,86	0,0	0,0	1,43	0,0

Lecturers: prof. RNDr. Libuša Šikurová, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-102/00	Physical Chemistry and Electrochemistry

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Fundamentals of chemical thermodynamics, thermochemistry, reaction enthalpy, enthalpy of formation. 2. Chemical potential and its application to equilibrium processes in one and multicomponent systems. 3. Colligative properties, electrolyte solutions, weak and strong electrolytes. 4. Activity, activity coefficient, electrolyte solutions as special case. Debay-Huckel limiting law. 5. Affinity of the chemical reaction, equilibrium constants. Application to electrolyte solutions: pH, pKa, buffer solutions, Henderson-Haselbalch equation. 6. Galvanic cell, Nernst equation, standard electrode potentials, its meaning for oxido-reduction processes. 7. Standard electrode potential and activity coefficient from measurement of EMF of galvanic cell. 8. Classification of electrodes, pH measurement. Corrosion from electrochemical point of view. 9. Introduction to chemical kinetics. Reaction order, methods for its determination. Reaction mechanism and its connection with rate low. 10. Gas-phase reactions. Lindemann-Hinshelwood mechanism. Complex mechanisms. 11. Collision and transition state theories of chemical kinetics. 12. Homogeneous and heterogeneous catalysis. Enzymatic catalysis, autocatalysis, chemical oscillations.

Recommended literature:
W.J. Moore, Physical Chemistry, SNTL Praha, 1979 (in Czech)
P.W Atkins, Physical Chemistry, Oxford Univ. Press, 2001.
P.W. Atkins, Fyzikálna chémia, STU, Bratislava, 1999 (Translation from English).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 64

A	B	C	D	E	FX
71,88	20,31	4,69	0,0	0,0	3,13

Lecturers: prof. Ing. Pavel Mach, CSc.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-110/00	Physical Education and Sport (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practicing of the students´ game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1329

A	B	C	D	E	FX
99,1	0,6	0,0	0,0	0,0	0,3

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of areobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1223

A	B	C	D	E	FX
99,84	0,08	0,0	0,0	0,0	0,08

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Branislav Nedbálek, PaedDr. Mikuláš Ortutay, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Júlia Raábová, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-210/00	Physical Education and Sport (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 992

A	B	C	D	E	FX
99,4	0,4	0,0	0,0	0,0	0,2

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-220/00	Physical Education and Sport (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 868

A	B	C	D	E	FX
99,31	0,46	0,0	0,0	0,12	0,12

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-142/00	Physical Mechanisms of the Processes in Human Organism

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Coordination of bone and muscular system during human locomotion. 2. Muscle work. 3. Mechanical work of human heart. 4. Flow properties of veins. 5. Blood hemodynamics. 6. Quantitative theory of human respiration system. 7. Origin of human voice. 8. Photoreception and theory of visual perception. 9. Reception of sound signal and sound analysis in the ear. 10. Helmholz and Békésy theories of hearing. 11. Perception of mechanical stimulation and pain by neural system. 12. Mechanism of smell and taste perception.

Recommended literature:
T. Crough, Physiological Processes, Academic Press, 1999.
T. C. Ruch, T. Patton, Physiology and Biophysics: Circulation, Respiration and Fluid Balance, Cambridge University Press, 2004.
http://en.wikipedia.org/wiki/Human_physiology

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 13

A	B	C	D	E	FX
92,31	7,69	0,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Melánia Babincová, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-222/00	Physics of Complex Systems

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Many different systems and processes. 2. Human brain functioning. 3. Connection between genotype and phenotype. 4. Life evolution. 5. Earthquake. 6. Evolution of stock market indexes. 7. Internet statistics and phase transitions in magnetic systems. 8. Uniform description by similar mathematics language. 9. Discrete scale invariance. 10. Stochastic resonance. 11. Self-organized critical state. 12. Fractals, renormalization group are part of it.

Recommended literature:
R. Serra, Introduction to the Physics of Complex Systems: The Mesoscopic Approach to Fluctuations, Non Linearity and Self-Organization, Pergamon 2003
N. Boccara, Modeling Complex Systems (Graduate Texts in Contemporary Physics), Springer, 2003.
http://en.wikipedia.org/wiki/Complex_system

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 6

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

Lecturers: prof. RNDr. Peter Babinec, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-206/15	Planning and Assessment of Experiments with Applications in Biomedicine and Biophysics

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBM-206/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 97

A	B	C	D	E	FX
87,63	9,28	3,09	0,0	0,0	0,0

Lecturers: doc. RNDr. Iveta Waczulíková, PhD.

Last change: 07.10.2016

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-108/15	Quantum Theory of Molecules

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 56 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 18

A	B	C	D	E	FX
94,44	5,56	0,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Peter Babinec, CSc., prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBM-141/00	Radiation Biophysics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 1 **per level/semester:** 14
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Interactions of particles with matter. Base of experimental and theoretical microdosimetry. Applications of microdosimetry in biology (radiobiology, radiotherapy, radiation protection). Survival Curve and its Significance. Theories and models for cell survival. Radiation effects of particles with high linear energy transfer. Radiation exposure from natural background and other sources.

Recommended literature:
Sedlák A.: Mikrodozimetrie a její aplikace, Academia, Praha, 1989
Kovař, Spurný F., Novotný , Cejnar: Pokroky dozimetrie ionizujúciho záření, Akademia, Praha, 1984
Alpen E.L.: Radiation Biophysics, Academic Press, San Diego, 1998
F. Fremuth, Účinky záření a chemických látek na bunky a organizmus, SPN Praha 1981

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 48

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

Lecturers: RNDr. Radoslav Böhm, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject provides a course in Russian language for beginners.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 642

A	B	C	D	E	FX
60,9	16,2	9,66	4,83	1,71	6,7

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of Russian language (1) and provides a course of Russian for beginners.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 389

A	B	C	D	E	FX
65,81	16,2	9,0	3,34	1,03	4,63

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
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:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 191

A	B	C	D	E	FX
70,68	17,28	8,38	2,62	0,0	1,05

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
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:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 130

A	B	C	D	E	FX
73,85	13,85	7,69	3,08	0,77	0,77

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-125/15	Semester Project

Educational activities:
Type of activities: independent work
Number of hours:
per week: 6 **per level/semester:** 84
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBF-125/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 17

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

Lecturers: prof. RNDr. Tibor Hianik, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-111/00	Special Practical (1)

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1. Safety regulations for the work with chemic and biological materials.
2. Solutions of the precise concentration, calculations, preparation and precise determination of the concentration. Volumetric accessories and its use.
3. Preparation and factorization of standard solutions of acids and bases.
4. Simple acidimetric titrations
5. – 6. Determination of partition coefficient of Iodine in system chloroform/water and determination of equilibrium constant for formation of I3(-).
7. – 8. Determination of molar mass of apple pectin from viscosity measurement
9. – 10. Study of kinetics of simple reactions. Measurement of rate constant and activation enthalpy of saccharose inversion using polarimetric method.
11. – 12. Colorimetric measurement of concentration. Protein concentration according to Lowry and Bradford methods.

Recommended literature:
T. Šipocz et al. Practical to the Experimental Methods of Biophysics. Text Nook, Comenius University,1989 (in Slovak)
O. Vollárová, O. Grančičová, Excercises from the Methods of Physical Chemistry, Text Book, Comenius University, 1990 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 17

A	B	C	D	E	FX
70,59	23,53	5,88	0,0	0,0	0,0

Lecturers: RNDr. Peter Rybár, PhD., Mgr. Zuzana Garaiová, PhD., doc. RNDr. Ivan Haverlík, CSc., RNDr. Marcela Morvová, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-112/00	Special Practical (2)

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 3 **per level/semester:** 42
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
1-2. Introductory statistics, concepts, models, and applications
3-4 Analysis of variance (ANOVA), regression analysis
5-6. Quantitative morphology of muscular tissue
7-8. Electron microscopy
9-10. Turbidimetric studies on lipid vesicles´ aggregation and fusion
11-12. Fluorescence spectroscopy analysis

Recommended literature:
V. Prosser et al., Experimental Methods of Biophysics, Academia, Praha 1989 (in Czech).
T.A. Lang and M. Secic, How to Report Statistics in Medicine, ACP Philadelphia PA, 1997.
Compiled training material.
B. Nölting, Methods in Modern Biophysics, Springer, 2006.
G.G. Hammes, Spectroscopy fo Biological Sceinces, Wiley, 2005
I.N. Serdyuk, N.R. Zaccai, J. Zaccai: Methods in molecular biophysics. Cambridge University Press, Cambridge, 2007

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 16

A	B	C	D	E	FX
62,5	31,25	6,25	0,0	0,0	0,0

Lecturers: RNDr. Peter Rybár, PhD., Mgr. Zuzana Garaiová, PhD., doc. RNDr. Ivan Haverlík, CSc., RNDr. Marcela Morvová, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-115/00	Special Seminar (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 14
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
At this seminar the faculty members and the external collaborators will present informal lectures to the students describing their research activities On the base of this presentation the students will select the theme of the project.

Recommended literature:
According to the recommendation of the project supervisor

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 20

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

Lecturers: prof. RNDr. Tibor Hianik, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-225/15	Special Seminar (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 14
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBF-225/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 8

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

Lecturers: prof. RNDr. Tibor Hianik, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 171

A	B	C	D	E	FX
99,42	0,0	0,58	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 171

A	B	C	D	E	FX
99,42	0,0	0,58	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 94

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

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in 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: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 94

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

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-141/11	Theoretical Fundamentals of Molecular Spectroscopy

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 5

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

Lecturers: prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/2-FBF-130/15	Theory of Intermolecular Systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KJFB/2-FBF-130/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 15

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

Lecturers: prof. RNDr. Peter Babinec, CSc.

Last change: 02.06.2015

Approved by: prof. RNDr. Tibor Hianik, DrSc.