CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ NMR1/00	**Course name:** 1D & 2D NMR Spectroscopy

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 3 **Per study period:** 28 / 42
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Active student´s work at seminars and individual homework, written examinations in 7th and 14th semestral week.
Terminal examination in written form (4 exercises from combined applications of 1D a 2D NMR and other spectral methods) and oral form (3 themes) joining theoretical knowledge with a practical solution of selected NMR problems and exercises.

Learning outcomes:
Students will learn how to analyze structure and properties of organic, inorganic and biomolecular compounds by 1D and 2D proton and carbon NMR spectra, quantitative NMR analysis, and practical applications in various fields of science and technology.

Brief outline of the course:
Theoretical principles of nuclear magnetic resonance (NMR), basic NMR pulse techniques and Fourier transformation, NMR spectrometers, description of NMR by vector models. Parameters of one- (1D) and two-dimensional (2D) NMR spectra, practical application of 1H and 13C NMR spectra and basic correlated 2D spectra for structure and stereochemical arrangement, elucidation of reaction mechanisms, molecular dynamics, physico-chemical properties and quantitative analysis of chemical compounds.

Recommended literature:
1. Friebolin H.: Basic One- and Two-Dimensional NMR Spectrocopy, 5. Ed., Wiley, 2010.
2. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, Elsevier, 1999.
3. Atta-ur-Rahman, M. I. Choudhary: Solving Problems with NMR spectroscopy, Academic Press 1996.
4. H.-O. Kalinowski, S. Berger, S. Braun: Carbon-13 NMR Spectroscopy. Wiley, New York 1988.
5. A. E. Derome: Modern NMR Techniques for Chemistry Research. Pergamon Press, Oxford 1987.
6. E. Pretsch, B. Buhlmann, C. Affolter: Structure Determination of Organic Compounds. Tables of Spectral Data. Springer Verlag, Berlin 2000.
7. E. Breitmaier: Structure Elucidation by NMR in Organic Chemistry: A Practical Guide, 3rd Ed., Wiley, 2002.

8. E. Breitmaier, W. Voelter: Carbon-13 NMR Spectroscopy. VCH Weinheim, 1990.

Course language:

Notes:

Course assessment
Total number of assessed students: 173

A	B	C	D	E	FX
38.15	26.01	24.28	9.83	1.73	0.0

Provides: doc. RNDr. Ján Imrich, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ AFS/05	**Course name:** Ancient Philosophy and Present Times

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 31

A	B	C	D	E	FX
80.65	6.45	6.45	0.0	6.45	0.0

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 17.09.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BCH1a/03	**Course name:** Biochemistry I

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:
test
Test and oral examination.

Learning outcomes:
The aim of Biochemistry I teaching is to acquire knowledge in the field of living organisms on the basis of the molecular structure and properties of biolomolecules.

Brief outline of the course:
Basic information on structure and properties of biomolecules(aminoacids, nucleotides,lipids, sugars, proteins, polynucleotides, polysaccharides, membranes, signal molecules).

Recommended literature:
Voet D., Voetová J. G., Biochemie, Victoria Publishing, Praha, 1994
Škárka B., Ferenčík M., Biochémia, Alfa, Bratislava, 2001
Musil J., Nováková O., Biochemie v obrazech a schématech, Avicenum, Praha, 1990
Berg J. M., Tymoczko J. L., Stryer L., Biochemistry, W. H. Freeman and Company, NY, 2007

Course language:

Notes:

Course assessment
Total number of assessed students: 636

A	B	C	D	E	FX
12.89	22.33	32.55	14.78	16.67	0.79

Provides: prof. Ing. Marián Antalík, DrSc., RNDr. Nataša Tomášková, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BCH1b/03	**Course name:** Biochemistry II

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚCHV/BCH1a/03

Conditions for course completion:
test
Test and oral examination.

Learning outcomes:
The aim of biochemistry teaching is to acquire knowledge in the field of living organisms on the basis of their molecular structure information on cell metabolism.

Brief outline of the course:
Basic principle of metabolism, basic metabolic pathways and cycles, integration of cell metabolism.

Recommended literature:
Voet D., Voetová J. G.: Biochemie, Victoria Publishing, Praha, 1994
Škárka B., Ferenčík M.: Biochémia, Alfa, Bratislava, 2001
Berg J. M., Tymoczko J. L., Stryer L.: Biochemistry, W. H. Freeman and Company, New York, 2007
Musil J., Nováková O.: Biochemie v obrazech a schématech, Avicenum, Praha, 1990

Course language:

Notes:

Course assessment
Total number of assessed students: 310

A	B	C	D	E	FX
32.26	28.39	15.81	10.0	10.97	2.58

Provides: prof. Ing. Marián Antalík, DrSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BIOE1/14	**Course name:** Bioenergetics I

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2., 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam

Learning outcomes:
To provide the introduction to the fundamental bioenergetic processes in the biological organisms. The emphasis will be on the description of the structure and function of the biomacromolecules involving in the processes of the oxidative phosphorylation. The principles of the membrane transport in the biological systems will be provide as well.

Brief outline of the course:
Energy in the biosphere. Fenomenology of bioenergetical processes. Control and regulation in bioenergetics. Chemiosmotic theory. Structure and function of the respiratory chain. Oxidative phosphorylation. The enzymes of the respiratory chain. Structure and function of NADH dehydrogenase (complex I), succinate dehydrogenase (complex II), cytochrome bc1 (complex III) and cytochrome c oxidase (complex IV). Formation of the mitochondrial proton gradient. Photosynthesis-basic informations and mechanisms. Thermodynamics and kinetics of membrane transport. Carriers, pumps and channels in the biological membranes.

Recommended literature:
Odporúčaná literatúra:
1. D. Nicholls and S. Fergusson. Bioenergetics 3, Academic Press, 2002.
2. M. Wikström (Ed.). Biophysical and structural aspects of bioenergetics, The Royal Society of Chemistry, 2005.
3. D. Harris. Bioenergetics at a glance, Blackwell Science Ltd., 1995.
4. V. Saks (Ed.). Molecular system bioenergetics, Wiley-VCH, 2007.
5. I. Scheffer. Mitochondria, John Wiley & Sons, Inc., 1999.
6. A.D.N.J. de Grey. The mitochondrial free radical theory of aging, R.G. Landis Company, 1999.
7. J.A.M. Smeiting, R.C.A. Sengers and J.M.F. Trijbels. Oxidative phosphorylation in health and disease, Kluwer Academic/Plenum Publisher, 2004.
8. N.W.C. Cheetham. Introducing biological energetics, Oxford University Press, 2011.

Course language:

Notes:

Course assessment
Total number of assessed students: 32

A	B	C	D	E	FX
87.5	3.13	6.25	0.0	3.13	0.0

Provides: doc. Mgr. Daniel Jancura, PhD., RNDr. Marián Fabián, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BSIM1/14	**Course name:** Biomolecular Simulations

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Elaboration and presentation of the project on given actual subject. Development of own computer programs on project given at the exercises. Exam. Might be substituted by written exam including Q/A part.

Learning outcomes:
Introduction to actual problematics of biomolecular simulations.

Brief outline of the course:
Structural characteristics of biological polymers. Foldamers. Central dogma of molecular biology as flow of biological information. 3D-structure and function of foldamers. Recent view on enzyme mechanisms. Experimental methods of structure determination and their limitations. Empirical force fields and methods of classical molecular dynamics. Molecular dynamics and Monte Carlo methods - algorithms and paralelization. Ab initio molecular dynamics and hybrid approaches. Computational challenges in biomolecular simulations - simulations of chemical reactions, free energy evaluation, protein folding. Computational complexity, nontraditional approaches and heuristic approaches.

Recommended literature:
Actual literature recommended by lecturer.

Course language:

Notes:

Course assessment
Total number of assessed students: 46

A	B	C	D	E	FX
76.09	8.7	10.87	2.17	2.17	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 27.03.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SBFc/03	**Course name:** Biophysical Seminary

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 1 **Per study period:** 14
Course method: present

Number of ECTS credits: 1

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
The active presence on the seminars.

Learning outcomes:
To teach students of the individual scientific work in the frame of the year's and diploma thesis and lead them to the intelligible presentation of the scientific results.

Brief outline of the course:
The seminar of the biophysics department oriented to the themes of the year's and diploma works.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 17

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SBFd/03	**Course name:** Biophysical Seminary

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 1 **Per study period:** 14
Course method: present

Number of ECTS credits: 1

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
The active presence on the seminars.

Learning outcomes:
To teach students of the individual scientific work in the frame of the year's and diploma thesis and lead them to the intelligible presentation of the scientific results.

Brief outline of the course:
The seminar of the biophysics department oriented to the themes of the year's and diploma works.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SBFe/03	**Course name:** Biophysical Seminary

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 1 **Per study period:** 14
Course method: present

Number of ECTS credits: 1

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
The active presence on the seminars.

Learning outcomes:
To teach students of the individual scientific work in the frame of the year's and diploma thesis and lead them to the intelligible presentation of the scientific results.

Brief outline of the course:
The seminar of the biophysics department oriented to the themes of the year's and diploma works.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 11

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SBFf/03	**Course name:** Biophysical Seminary

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 1 **Per study period:** 14
Course method: present

Number of ECTS credits: 1

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:
The active presence on the seminars.

Learning outcomes:
To teach students of the individual scientific work in the frame of the year's and diploma thesis and lead them to the intelligible presentation of the scientific results.

Brief outline of the course:
The seminar of the biophysics department oriented to the themes of the year's and diploma works.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/MSSBF/14	**Course name:** Biophysics

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities: ÚFV/MOS/14,ÚCHV/BCH1a/03,ÚFV/BFB1/14,ÚFV/CHV1/03,ÚFV/MBF1/14,ÚFV/ZBMB/14,ÚFV/FCH1/02,ÚCHV/BCH1b/03,ÚCHV/STA1/03

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
40.0	26.67	26.67	6.67	0.0	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BFB1/14	**Course name:** Cell Biophysics I

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Participation in problem solution, participation at the lectures. Exam.

Learning outcomes:
Students completing the course will gain basic knowledge about the mechanisms of processes that appear in living organisms at cellular level.

Brief outline of the course:
Membrane transport: Structure, properties and functions of biological membranes. Thermodynamics and active membrane transport. Classification and properties of transport membrane proteins. Oxidative phosphorylation. Photosynthesis. Action potential. Transmission of signals through synapses. Muscle contraction.
Metabolic signal pathways: General description of signal pathways in cells. Extracellular signal molecules and cellular receptors. Intracellular signal molecules and their role in signal processes.

Recommended literature:
1. C.Hidalgo: Physical Properties of Biological Membranes,Plenum Press, New York 1988
2. van Winkle I. J.: Biomembrane transport, Academic Press, San Diego 1999
3. Stein W. D.: Channels, carriers, and pumps, Academic Press, San Diego 1990
4. Glaser R.: Biophysics, Springer-Verlag, Heidelberg 1999
5. Pollard T. D., Earnshaw W. C.: Cell biology, Saunders, Philadelphia 2004
6. Alberts: Molecular biology of the cell, Garland Science, New York 2002

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 159

A	B	C	D	E	FX
22.64	25.79	18.24	23.9	8.18	1.26

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 03.05.2015
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ KDF/05	**Course name:** Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction)

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

A	B	C	D	E	FX
50.0	20.0	10.0	0.0	10.0	10.0

Provides: PhDr. Dušan Hruška, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/KK/07	**Course name:** Communication and Cooperation
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 281

abs	n	z
98.22	1.78	0.0

Provides: Mgr. Ondrej Kalina, PhD., Mgr. Lucia Barbierik, PhD.
Date of last modification: 24.06.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VMS1/03	**Course name:** Computing Methods in X-Ray Structure Analysis

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚCHV/STA1/03

Conditions for course completion:
Semester project.

Learning outcomes:
Crystal structure analysis of simple samples, tabular and graphical processing of the results.

Brief outline of the course:
Practical course of crystal structures solution for substances with the number of atoms less than 1000 since data processing to publishing structures: selection of the right space group and generate the necessary files for the structure solution (Wingx); search for the model of the structure (SHELX, SIR and SUPERFLIP), refinement of the model (SHELX); graphical representation of the structure (DIAMOND); drawing of the structural scheme (ISIS DRAW); calculations of bond lengths, angles and hydrogen bonds (PARST); tabulation of the results of crystal structure analysis, obtaining the necessary data for similar structures from the Cambridge Structural Database System. Processing of results of powder diffraction technique, modeling of powder diffraction patterns (MERCURY).

Recommended literature:
Manuals for the programs.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 64

A	B	C	D	E	FX
81.25	10.94	3.13	4.69	0.0	0.0

Provides: doc. RNDr. Ivan Potočňák, PhD.

Date of last modification: 25.03.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/DPO/14	**Course name:** Diploma Thesis and its Defence

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of ECTS credits: 20

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 65

A	B	C	D	E	FX
70.77	18.46	6.15	1.54	3.08	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ENZ/04	**Course name:** Enzymology

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
combination of written and oral examination

Learning outcomes:
To learn to use the basic equations of enzyme kinetics. Ability to determine basic kinetic and thermodynamic parameters of enzyme catalyzed reaction from experimental measurement.

Brief outline of the course:
1. Introduction. Chemical catalysis – theory of transition state.
2. Enzyme catalysis - types and examples.
3. Cofactors. Active site - lock and key, induced fit. Enzymes - classification.
4. 3D structure of proteins. Noncovalent interactions. Secondary, tertiary and quaternary structures. Convergent and divergent evolution. Multienzyme complexes. Dyanmics of proteins.
5. Ligand binding. Thermodynamics and konetics. Techniques.
6. Chemical kinetics. Basic equations of enzyme kinetics.
7. Regulations of enzyme activity - examples.
8. Conformational change, allosteric regulation. Regulation of metabolic pathways.
9. Experimental determination of enzyme activity. pH and temperature dependence of enzyme catalysis.
10. Determination of individual rate constants. Stop flow. Enzyme-substrate complementarities and the use of binding energy in enzyme catalysis.
11. Reversible inhibition.
12. Irreversible inhibition.
13. Specificity and control mechanisms. „Moonlighting“ enzymes. Applications of enzymes (organic solvents). Catalytic antibodies. Extremophiles. Directed selection of enzymes. Enzymatic reactions with multiple substrates.

Recommended literature:
Alan Fersht “Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding. “ (3rd Ed. W. H. Freeman and Company, 1999)
Robert A. Copeland: Enzymes (2nd edition), Wiley-VCH, 2000.

Course language:

Notes:

Course assessment
Total number of assessed students: 143

A	B	C	D	E	FX
39.16	22.38	17.48	14.69	5.59	0.7

Provides: doc. RNDr. Erik Sedlák, DrSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ EMBF/14	**Course name:** Experimental Methods of Biophysics

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam.

Learning outcomes:
To provide the introduction to some experimental methods applied in biophysics.

Brief outline of the course:
Fluorescence spectroscopy and imaging, CD spectroscopy, differential scanning calorimetry (DSC), isothermal titration calorimetry (ITC), spot flow, electrophoresis, chromatography, introduction to patch clamp and flow cytometry.

Recommended literature:
1. J.E. Landbury and B.Z. Chowdhry, Biocalorimetry: Application of calorimetry in the biological sciences, Wiley, 1998
2. Alice L. Givan: Flow Cytometry, first principles, second edition, Wiley, 2001
3. Joseph R. Lakowicz: Principles of Fluorescence Spectroscopy, Third edition, Springer 2006
4. Ewa M. Goldys: Fluorescence Applications in Biotechnology and the Life Sciences, 2009, Wiley-Blackwell

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 12

A	B	C	D	E	FX
66.67	25.0	8.33	0.0	0.0	0.0

Provides: doc. RNDr. Katarína Štroffeková, PhD., doc. RNDr. Erik Sedlák, DrSc., RNDr. Gabriela Fabriciová, PhD., RNDr. Marián Fabián, CSc., RNDr. Gabriel Žoldák, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ZBMB/14	**Course name:** Fundamentals of Cellular and Molecular Biology

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Test.
Exam.

Learning outcomes:
To provide basic information about the structure and function of cells and genetics processes.

Brief outline of the course:
Characteristics of cells, the surface of the cell, biological membranes, cell's organells, the cell cycle. Macromolecules of information, , genome of prokaryotes, eukaryotes and viruses, the mechanisms of DNA replication, mechanisms of transcription and transduction, the regulation of gene expression, mutations nad mutagenes, experimental methods in molecular biology.

Recommended literature:
1. K. Kapeller, H. Strakele, Cytomorfológia, Osveta, Martin 1999.
2. G. M. Cooper, The cell a molecular approach, ASM Press, Washington 2000.
3. J. D. Watson, molekulární biologie genu, Acadenie, Praha 1982.
4. J. Darnell, H. Lodish, D. Baltimore: Molecular Cell Biology, W. H. Freeman and Co., New York 1990. 5. S. Rosypal, Úvod do molekulární biologie I, II, III, Brno 1997.

Course language:

Notes:

Course assessment
Total number of assessed students: 31

A	B	C	D	E	FX
61.29	25.81	6.45	0.0	6.45	0.0

Provides: prof. RNDr. Pavol Miškovský, DrSc., RNDr. Zuzana Naďová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ DF2p/03	**Course name:** History of Philosophy 2 (General Introduction)

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 1 **Per study period:** 28 / 14
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 742

A	B	C	D	E	FX
60.78	13.88	12.67	8.63	3.37	0.67

Provides: Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.

Date of last modification: 25.03.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ IH2/03	**Course name:** Idea Humanitas 2 (General Introduction)

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

A	B	C	D	E	FX
90.0	10.0	0.0	0.0	0.0	0.0

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 12.02.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MOS/14	**Course name:** Methods of Optical Spectroscopy
Course type, scope and the method: **Course type:** Lecture **Recommended course-load (hours):** **Per week:** 3 **Per study period:** 42 **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course: 1.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Exam.	
Learning outcomes: Basic knowledge of optical spectroscopy for biophysical applications.	
Brief outline of the course: Theory of light-matter interactions. Molecular motions and the corresponding spectra – Born-Oppenheimer approximation, general scheme of transitions in complicated organic molecules. Probability of spontaneous and stimulated transitions. Basic scheme of an optical spectroscopic apparatus. Infrared spectroscopy (vibrations of diatomic and polyatomic molecules, anharmonicity of vibrations, characteristic vibrations, experimental methods of infrared spectroscopy, biophysical applications of infrared spectroscopy). Raman scattering (physical principles, experimental arrangements, biophysical applications). Electronic spectroscopy (electron states of diatomic and polyatomic molecules – electronic spectra, Franck-Condom principle, polarization of electronic spectra, experimental arrangements, biophysical applications). Emission spectroscopy (luminescence quantum yield and intensity, lifetime of excited states, experimental arrangements, biophysical applications).	
Recommended literature: 1. Biophysics, Springer-Verlag, Heidelberg 1983. 2. J. Michael Hollas: Modern Spectroscopy, forth editionJohn Wiley, England 2004 3. P. Miškovský a kol., Praktikum k experimentálnym metódam biofyziky I, skriptum PF UPJŠ Košice 1989. 4. V. Prosser a kol., Experimentální metody biofyziky, Academia, Praha 1989. 5. P. Atkins, J. de Paula, Physical Chemistry, Oxford University Press, New York 2002.	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
22.22	25.93	44.44	3.7	3.7	0.0

Provides: prof. RNDr. Pavol Miškovský, DrSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MBF1/14	**Course name:** Molecular Biophysics I

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Exam.

Learning outcomes:
Students completing the course will gain basic knowledge about the structure and principles of organization of the biological macromolecules.

Brief outline of the course:
Fundamental characteristic of biomolecules: composition, chemical bond, inter- and intramolecular interactions. Geometry of polymer chain: model of random coil, persistence length, wormlike chain, radius of gyration. Structure and properties of nucleic acids. Structure and properties of proteins. Structure and properties of saccharides. Structure and properties of lipids. Hydration of biopolymers: properties of water, hydration of proteins, hydration of nucleic acids.

Recommended literature:
1. C.R.Cantor, P.R.Schimmel, Biophysical Chemistry Part I-III, Freeman and Co., San Francisco, 1980.
2. P.Jasem, M.Fabián, Vybrané kapitoly z molekulárnej biofyziky, PF UPJŠ Košice, 1985.
3. H.Frauenfelder, J.Disenhofer, P.G.Wolyns, Simplicity and Complexity in Proteins and Nucleic Acids, Dahlem University Press, 1999.
4. M. Daune, Molecular biophysics, Oxford University press, 2004.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
60.71	28.57	7.14	0.0	3.57	0.0

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ CHV1/03	**Course name:** Molecular Structure and Chemical Bonding

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Elaboration of the project - characterization of the chosen molecule using methods mentioned in the course. Exam. Written form, including Q/A part allowed due to corona-virus measures.

Learning outcomes:
Attendees will learn actual methods used for computer simulations of molecules. By using practical examples he/she will get hands-on experience with standart methods.

Brief outline of the course:
Born-Oppenheimer approximation. Methods and approaches of classical molecular mechanics. Force fields and force constants for polyatomic simulations. Force fields for biomolecular simulations (CHARMM, AMBER, MM2-4, MMFF, CVFF,...). Independent electron approximation. Hartree-Fock self-consistent field method. Post Hartee-Fock methods. Density functional theory (DFT) - basic principles and implementation. LSDA approximation and gradient corrected methods. Hybrid methods. Wavefunction and electron density analysis. Limits and perspectives of classical and quantum molecular mechanics. Alternativ methods. Ab initio computations and experimental observables. Experimental and computational observables. Molecular dynamics and stochastic methods. Integration algorithms. Car-Parinello dynamics.

Recommended literature:
1. Leech: Molecular Modeling: Principles and Applications, Longmann, 1996.
2. M.P. Allen, D.J. Tildesley: Computer Simulation of Liquids, Oxford University Press, 1989.
3. Polák, Zahradník: Kvantová chemie, SNTL/Alfa , 1985.
4. P. W. Atkins, R. S. Friedman: Molecular Quantum Mechanics.Oxford University Press, 1997

Course language:

Notes:

Course assessment
Total number of assessed students: 39

A	B	C	D	E	FX
53.85	25.64	15.38	5.13	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.
Date of last modification: 27.03.2020
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ NOT1a/03	**Course name:** Nontraditional Optimization Techniques I
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 2 / 2 **Per study period:** 28 / 28 **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course: 1., 3.	
Course level: I., II.	
Prerequisities:	
Conditions for course completion: Monitoring progress in solving applied projects. examination (50%), quality of the project (50%) examination	
Learning outcomes: To familiarize students with biologically and physically inspired optimization, simulation and prediction techniques. To expand students' creativity and programming skills by applying heuristic techniques in solving applied problems.	
Brief outline of the course: Fundamentals of optimization theory. Basic optimization problems. Basic types of objective functions. Classification of optimization techniques. Gradient-based optimization techniques. Evolutionary algorithms. Genetic algorithms. Genetic algorithms as Markov processes. Statistical Mechanics Approximations of Genetic Algorithms. Monte Carlo simulation and simulated annealing. Swarm optimization. Cellular Automata and their applications in simulations of complex systems. Fractals. Agent-based models. Evolutionary games. Evolution of cooperation. Fundamentals of Neural Networks. Application of singular value decomposition to solve least squares problems.	
Recommended literature: Hartmann, A. K., Rieger, H., Optimization Algorithms in Physics, Wiley, 2002 Reeves, C. R., Rowe, J. E., Genetic Algorithms: Principles and perspectives, Kluwer, 2003 Mitchell, M., Complexity. A Guided Tour, Oxford University Press, 2009 Solé, R. V., Phase Transitions, Princeton University Press, 2011 Ilachinski, A., Cellular Automata. A Discrete universe, World Scientific, 2002 Haykin, S., Neural Networks. A Comprehensive Foundation, Prentice-Hall, 1999	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 85

A	B	C	D	E	FX
69.41	16.47	8.24	2.35	3.53	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ NOT1b/03	**Course name:** Nontraditional Optimization Techniques II

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Presentation of the project in written form. Oral exam and discussion of the presented project. Should corona-virus quarantine persist, written report and answer to posed questions suffice.

Learning outcomes:
By using examples from the biology to learn applications of optimization techniques on study and interpretation of complex systems. Introduction to new paradigms in the area of systems biology, including parasite/host coevolution.

Brief outline of the course:
Complex systems, emergent behavior. Evolutionary theory and memetics. Application of optimization techniques on complex systems. Application of methods /genetic algorithms, simulated annealing, taboo search/ on selected problems of biomolecular simulations. Molecular dynamics, protein folding. Population dynamics, metabolic networks and complexity in bioinformatics.

Recommended literature:
The actual scientific papers.

Course language:

Notes:

Course assessment
Total number of assessed students: 50

A	B	C	D	E	FX
88.0	4.0	6.0	2.0	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 27.03.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ FChFB/14	**Course name:** Photochemistry and photobiology

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
presentation, oral exam

Learning outcomes:
Introduction to a problematic of light interaction with biological systems, especially the role of light activated molecules in biology and medicine. Description of relevant spectral, photochemical and photobiological concepts used in this field. Besides basic knowledge in photochemistry and photobiology students will be familiar with methods and detection systems applied in this area. Applications will be focused to a light activated therapy.

Brief outline of the course:
Lectures: 1. tissue optics, 2. detection and applications of endogenous and exogenous fluorophores , 3. photophysics, 4. photochemistry, 5. photobiology, 6. technics used in light-activated therapies
Presentation: oral presentation of new trends in photophysics, photochemistry and photobiology.

Recommended literature:
Mycek & Pogue, "Handbook of Biomedical Fluorescence", Dekker, 2003.
R. Splinter & B.A. Hooper, "An introduction to Biomedical Optics", Taylor&Francis, 2007.
Lakowicz, “Principles of fluorescence spectroscopy“, Springer 2006.
Muzykantov & Torchilin, “Biomedical aspects of drug targeting“, Kluwer Academic Publishers 2002

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 7

A	B	C	D	E	FX
85.71	0.0	14.29	0.0	0.0	0.0

Provides: prof. RNDr. Pavol Miškovský, DrSc., RNDr. Veronika Huntošová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/FOT/14	**Course name:** Photonics

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam

Learning outcomes:
Students completing the course will gain basic knowledge in the field of photonics with a focus on the practical use of optical phenomena for scientific purposes. Students will also get an overview of optical components and equipment that are used in photonic and/or laser experiments.

Brief outline of the course:
Introduction to photonics: ray optics, wave optics, beam optics, electromagnetic optics, polarization optics, photon optics. Resonator optics, laser amplifiers, lasers. Optical devices: acousto-optics, electro-optics. The basics of non-linear optics.

Recommended literature:
1. B. E. A. Saleh, M. C. Teich, Fundamentals of Photonics, John-Wiley & Sons 2007 New Jersey
2. W. Demtroder, Laser Spectroscopy, Springer-Verlag 2008 Berlin

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 11

A	B	C	D	E	FX
27.27	45.45	27.27	0.0	0.0	0.0

Provides: prof. RNDr. Pavol Miškovský, DrSc., doc. Mgr. Gregor Bánó, PhD.

Date of last modification: 23.06.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ FCH1/02	**Course name:** Physical Chemistry for Biological Sciences

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 2 **Per study period:** 42 / 28
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Test
Exam

Learning outcomes:
The introduction into the fundamental knowledge of selected parts of physical chemistry with emphasis on the utilization of these knowledges for the study of physico-chemical properties of biomacromolecules and biological systems.

Brief outline of the course:
Description of macroscopic systems, energy and 1. law of thermodynamics, entropy and 2. law of thermodynamics, Gibbs energy and equilibrium state, chemical potential, binding constants of the ligand-macromolecule interactions, biophysical applications of the thermodynamics. Solutions, electrolytic solutions, electrochemical equilibrium, electrodes, electrochemical potential. Statistical thermodynamics: the interpretation of energy, heat, entropy and information; the partition functions, biological applications of statistical thermodynamics, the conformational transitions in proteins and nucleic acids. Chemical reactions, chemical and biochemical kinetics, dynamics of the chemical reactions, kinetics of the enzymatical reactions, inhibition of the enzymes. Transport processes, molecular diffusion, membrane transport and its significance for the biological organisms.

Recommended literature:
1. P. Atkins and J. de Paula. Atkins's Physical Chemistry (9th Edition), Oxford University Press, 2010.
2. P. Atkins. Fyzikálna chémia (slovenský preklad 6. vydania), STU Bratislava, 1999.
3. P. Atkins, J. De Paula. Fyzikální chemie (český preklad 9. vydania), VŠCHT Praha, 2013
4. R.Chang. Physical Chemistry for the Biosciences, University Science Book, 2006.
5. D. Eisenberg and D. Crothers. Physical Chemistry with Applications to the Life Sciences, Benjamin/Cummings, 1979.
6. K. van Holde, W. Johnson and P. Ho. Principles of Physical Biochemistry, Prentice Hall, 1988.
7. D.T. Haynie. Biological Thermodynamics (2nd Edition), Cambridge University Press, 2008.

8. A.P.H. Peters. Concise Chemical Thermodynamics (3rd Edition), CRC Press, Taylor & Francis Group, 2010.
9. I. Tinoco, jr., K. Sauer, J.C. Wang, J.C. Puglisi, G. Harbison and D.Rovnyak. Physical Chemistry – Principles and Applications in Biological Sciences (5th Edition), Pearson, 2014.
10. A. Cooksy. Physical Chemistry- Thermodynamics, Statistical Mechanics, and Kinetics, Pearson, 2014.

Course language:

Notes:

Course assessment
Total number of assessed students: 100

A	B	C	D	E	FX
18.0	29.0	31.0	11.0	11.0	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ PEMBF/14	**Course name:** Practical excercises in experimental methods of biophysics

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities: ÚFV/EMBF/14

Conditions for course completion:
Completion of protocols and presentation of results.

Learning outcomes:
To obtain the basic skills for the manipulations with the instruments utilized in biophysics.

Brief outline of the course:
Practical training in the subject "Experimental methods of biophysics". The training includes practical introduction into the following experimental techniques: Fluorescence spectroscopy and imaging, CD spectroscopy, differential scanning calorimetry (DSC), isothermal titration calorimetry (ITC), spot flow, electrophoresis, chromatography, patch clamp and flow cytometry.

Recommended literature:
1. J.E. Landbury and B.Z. Chowdhry, Biocalorimetry: Application of calorimetry in the biological sciences, Wiley, 1998
2. Alice L. Givan: Flow Cytometry, first principles, second edition, Wiley, 2001
3. Joseph R. Lakowicz: Principles of Fluorescence Spectroscopy, Third edition, Springer 2006
4. Ewa M. Goldys: Fluorescence Applications in Biotechnology and the Life Sciences, 2009, Wiley-Blackwell

Course language:

Notes:

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Erik Sedlák, DrSc., RNDr. Gabriela Fabriciová, PhD., doc. RNDr. Katarína Štroffeková, PhD., RNDr. Marián Fabián, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/PRb/04	**Course name:** Practical excercises in methods of optical spectroscopy

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/MOS/14

Conditions for course completion:
Completed individual project.

Learning outcomes:
To obtain the basic skills for the manipulations with the instruments utilized in optical spectroscopy.

Brief outline of the course:
Practical training in the subject "Methods of optical spectroscopy". The training includes practical introduction into the following experimental techniques:UV-VIS spectroscopy, fluorescence spectroscopy, Raman spectroscopy.

Recommended literature:
1. V. Prosser a kol., Experimentální metody biofyziky, Academia, Praha 1989.
2. S. Miertus a kol., Atómová a molekulová spektroskopia, Alfa, Bratislava 1991.
3. P. Jasem a kol., Praktikum k experimentálnym metódam biofyziky, PF UPJŠ, Košice 1990.
4. I.N. Serdyuk, N.R. Zaccai and J. Zaccai, Methods in molecular biophysics, Cambridge University Press, 2007.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 13

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/PPZMg/12	**Course name:** Psychology and Health Psychology (Master´s Study)

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Conditions for the continuous assessment during the semester:
Active work (maximum 5 points, 2 absences are allowed).
Preparation, presentation and discussion on a selected topic - max. 15 points.
Written examination (maximum 30 points).
Conditions for admission to the exam: min. 25 points.
Conditions for the final assessment:
Exam: written form (max. 50 points, min. 25 points)
Conditions for successful completion of the course: participation in lessons, fulfillment of assignments and at least 66 points from the overall evaluation.
Detailed information in the electronic bulletin board of the course in AIS2. The teaching of the subject will be realized by a combined method.

Learning outcomes:
The student will understand the basic concepts and theories of health psychology, can explain salutogenic factors as well as the consequences of risk behavior related to health. He is able to apply the knowledge especially in the field of prevention of burnout syndrome and support of mental health in the work of a teacher.

Brief outline of the course:
1 Introduction to health psychology
2 Psychoimmunology
3 Personality factors and health
4 Social support as a protective factor in relation to health
5 Subjective well-being
6 Stress and stressful situations and ways to manage them
7 Burnout syndrome
8 Health-promoting behavior, mental hygiene
9 Health risk behavior
10 School as an important factor of health

Recommended literature:
Křivohlavý, J.: Psychologie zdraví. Portál, Praha 2001.

Křivohlavý, J.: Psychologie nemoci. Grada, Praha, 2002.
Křivohlavý, J.: Psychologie moudrosti a dobrého života. Grada, Praha, 2009.
Kebza, V.: Psychosociální determinanty zdraví. Academia, Praha 2005.
Kahneman, D., Diener, E., Schwarz, N.(Eds), Well-Being. The Foundations of Hedonic Psychology. New York, Russell Sage Foundation, 2003.
Kaplan, R. M.: Zdravie a správanie človeka. SPN, Bratislava 1996.
Sarafino, E. P.: Health Psychology. Biopsychosocial interactions. John Wiley and sons 1994.
Baštecký, J., Šavlík, J., Šimek, J. 1993. Psychosomatická medicína. Praha: Grada
Tress, W., Krusse, J., Ott,J.: Základní psychosomatická péče. Portál, Praha 2008.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 226

A	B	C	D	E	FX
19.47	25.22	25.66	13.27	15.93	0.44

Provides: PhDr. Anna Janovská, PhD., Mgr. Lucia Barbierik, PhD.

Date of last modification: 07.07.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ ÚTVŠ/CM/13	**Course name:** Seaside Aerobic Exercise

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 36s
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:
Conditions for course completion:
Attendance

Learning outcomes:
Learning outcomes:
Students will be provided an overview of possibilities how to spend leisure time in seaside conditions actively and their skills in work and communication with clients will be improved. Students will acquire practical experience in organising the cultural and art-oriented events, with the aim to improve the stay and to create positive experiences for visitors.

Brief outline of the course:
Brief outline of the course:
1. Basics of seaside aerobics
2. Morning exercises
3. Pilates and its application in seaside conditions
4. Exercises for the spine
5. Yoga basics
6. Sport as a part of leisure time
7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly)
8. Application of seaside cultural and art-oriented activities in leisure time

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 41

abs	n
12.2	87.8

Provides: Mgr. Agata Horbacz, PhD.
Date of last modification: 15.03.2019
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPBFa/14	**Course name:** Semestral work I

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Completion of project and its defense.

Learning outcomes:
To realize experimental and/or theoretical works within the frame of chosen theme and present in consistent way the results of this work.

Brief outline of the course:
Work on the chosen project on the Department of biophysics.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
87.5	12.5	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPBFb/14	**Course name:** Semestral work II

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Completion of project and its defense.

Learning outcomes:
To realize experimental and/or theoretical works within the frame of chosen theme and present in consistent way the results of this work.

Brief outline of the course:
Work on the chosen project on the Department of biophysics.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPBFc/14	**Course name:** Semestral work III

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Completion of project and its defense.

Learning outcomes:
Work on the chosen project on the Department of biophysics.

Brief outline of the course:
Work on the chosen project on the Department of biophysics.

Recommended literature:
The literature will be recommended by supervisors of individual works.

Course language:

Notes:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
93.33	0.0	6.67	0.0	0.0	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/SPVKE/07	**Course name:** Social-Psychological Training of Coping with Critical Life Situations

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 126

abs	n	z
97.62	2.38	0.0

Provides: Mgr. Ondrej Kalina, PhD.

Date of last modification: 11.02.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ TVa/11	**Course name:** Sports Activities I.
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** combined, present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 1.	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion: Min. 80% of active participation in classes.	
Learning outcomes: Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.	
Brief outline of the course: Brief outline of the course: Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 12859

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
87.01	0.08	0.0	0.0	0.0	0.04	8.1	4.77

Provides: Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.

Date of last modification: 13.05.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVb/11	**Course name:** Sports Activities II.

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:
active participation in classes - min. 80%.

Learning outcomes:
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

Brief outline of the course:
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness.
In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11675

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
84.52	0.56	0.02	0.0	0.0	0.05	10.63	4.22

Provides: Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.
Date of last modification: 13.05.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVc/11	**Course name:** Sports Activities III.

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:
min. 80% of active participation in classes

Learning outcomes:
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

Brief outline of the course:
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness.
In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 7873

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.8	0.05	0.01	0.0	0.0	0.03	4.08	7.04

Provides: Mgr. Marcel Čurgali, Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.
Date of last modification: 13.05.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/TVd/11	**Course name:** Sports Activities IV.

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:
min. 80% of active participation in classes

Learning outcomes:
Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.

Brief outline of the course:
Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess.
In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness.
In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 5125

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
83.14	0.31	0.04	0.0	0.0	0.0	7.75	8.76

Provides: Mgr. Marcel Čurgali, Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.
Date of last modification: 13.05.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ STA1/03	**Course name:** Structure Analysis

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 written tests.
30 %
The final examination is in a written form. The final mark is based on the results from current and final tests.

Learning outcomes:
Students get an overview about the symmetry at the micro- and macrostructure level and about diffraction methods used for the crystal structure determination and they will learn how to use the results of the crystal structure analysis in their own work.

Brief outline of the course:
Macrostructure and microstructure symmetry, individual work with space groups. Theoretical basis of the diffraction experiment. Practical aspects of crystal structure solution. Processing the results of structural analysis. Theoretical basis, practical aspects and possibilities of X-ray powder diffraction analysis, its use at work of a chemist.

Recommended literature:
Massa, W.: Crystal structure determination, 2nd edition. Springer 2004.
Clegg, W. et al.: Crystal structure analysis. Principles and practice. Oxford University Press 2009.
Hahn, T.: International tables for crystallography, Vol. A. Kluwer Academic Publishers 2002.
Stout, G.H. & Jensen, L.H.: X-ray Structure Determination. Macmillan Publishing Co., Inc. 1968.
Klug, H.P. & Alexander, L.E.: X-Ray diffraction procedures for polycrystalline and amorphous materials. John Wiley & Sons, Inc. 1970.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 119

A	B	C	D	E	FX
28.57	16.81	26.05	19.33	8.4	0.84

Provides: doc. RNDr. Ivan Potočňák, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ SVKB/14	**Course name:** Student Scientific Conference
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 10

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides:
Date of last modification:
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ LKSp/13	**Course name:** Summer Course-Rafting of TISA River
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 36s **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion: Conditions for course completion: Attendance Final assessment: Raft control on the waterway (attended/not attended)	
Learning outcomes: Learning outcomes: Students have knowledge of rafts (canoe) and their control on waterway.	
Brief outline of the course: Brief outline of the course: 1. Assessment of difficulty of waterways 2. Safety rules for rafting 3. Setting up a crew 4. Practical skills training using an empty canoe 5. Canoe lifting and carrying 6. Putting the canoe in the water without a shore contact 7. Getting in the canoe 8. Exiting the canoe 9. Taking the canoe out of the water 10. Steering a) The pry stroke (on fast waterways) b) The draw stroke 11. Capsizing 12. Commands	
Recommended literature:	
Course language:	
Notes:	

Course assessment Total number of assessed students: 153	
abs	n
45.75	54.25
Provides: Mgr. Dávid Kaško, PhD.	
Date of last modification: 18.03.2019	
Approved:	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ KP/12	**Course name:** Survival Course

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 36s
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:
Conditions for course completion:
Attendance
Final assessment: continuous fulfilment of all tasks within the course

Learning outcomes:
Learning outcomes:
Students will be familiarized with principles of safe stay and movement in extreme natural conditions as they will obtain theoretical knowledge and practical skills to solve the extraordinary and demanding situations connected with survival and minimization of damage to health. The course develops team work and students will learn how to manage and face the situations that require overcoming of obstacles.

Brief outline of the course:
Brief outline of the course:
Lectures:
1. Principles of behaviour and safety for movement and stay in unknown mountains
2. Preparation and leadership of tour
3. Objective and subjective danger in mountains
4. Principles of hygiene and prevention of damage to health in extreme conditions
Exercises:
1. Movement in terrain, orientation and navigation in terrain (compasses, GPS)
2. Preparation of improvised overnight stay
3. Water treatment and food preparation.

Recommended literature:

Course language:

Notes:

Course assessment Total number of assessed students: 393	
abs	n
44.53	55.47
Provides: MUDr. Peter Dombrovský, Mgr. Ladislav Kručanica, PhD.	
Date of last modification: 15.03.2019	
Approved:	