COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ ABE/18	**Course name:** Analýza biofyzikálnych experimentov

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 credits: 4

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. Mgr. Gregor Bánó, PhD., RNDr. Gabriel Žoldák, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ ALG3b/10	**Course name:** Algebra II for informaticians and physicists

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 4.

Course level: I., II.

Prerequisities: ÚMV/ALGa/10

Conditions for course completion:
Exam

Learning outcomes:
To provide deeper knowledge on vector spaces, linear transformations and Euclidean spaces.

Brief outline of the course:
Vector spaces, subspaces. A basis, a dimension and a characterization of n-dimensional vector spaces. The rank of a matrix. Linear transformations and their matrices. Operations with linear tranformations, matrices of sums and compositions of linear tranformations. Regular linear transformations, regular matrices. Similar matrices. Characteristic vectors and characteristic values of linear transformations.
Affine spaces, subspaces and their positions. Euclidean spaces, the distance of subspaces. Conics and quadrics.

Recommended literature:
A. F. Beardon: Algebra and Geometry, Cambridge University Press, 2005
G. Birkhoff, S. Mac Lane: A Survey of Modern Algebra, New York 1965

Course language:
Slovak

Course assessment
Total number of assessed students: 343

A	B	C	D	E	FX
11.66	9.33	9.91	14.87	40.52	13.7

Provides: doc. RNDr. Roman Soták, PhD., RNDr. Mária Maceková, PhD.

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ ALGa/10	**Course name:** Algebra I

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

Number of credits: 7

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
According to the results from the semester and in view of the results of the written and oral final exam..

Learning outcomes:
To obtain basic knowledge from number theory concerning divisibility and from linear algebra concerning systems of linear equations. To be able to apply it in concrete excercises.

Brief outline of the course:
Divisibility in Z. Fields. Systems of linear equations, Gauss elimination. Maps, permutations. Computing with matrices. Determinants, Cramer rule.

Recommended literature:
T.S Blyth, E.F. Robertson: Basic linear algebra, Springer Verlag, 2001.
K. Jänich: Linear algebra, Springer Verlag, 1991.

Course language:
Slovak

Course assessment
Total number of assessed students: 1387

A	B	C	D	E	FX
11.1	11.9	17.88	17.74	28.98	12.4

Provides: prof. RNDr. Danica Studenovská, CSc., RNDr. Igor Fabrici, Dr. rer. nat., RNDr. Martina Tamášová, Mgr. Simona Rindošová, Mgr. Ivana Varga

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BAC1/04	**Course name:** Bioinorganic Chemistry I

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 credits: 5

Recommended semester/trimester of the course: 3.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Test or seminar works
examination

Learning outcomes:
The basic knowledges about biometal interactions with biomolecules, biomaterials, biominerals, biocatalysis, metals in biology and medicine, metal-based drugs, toxic metals for biosystems and metals in the environment.

Brief outline of the course:
Metalic and non-metalic elements and their roles in biological systems (biometals, bulk biological elements, essential trace elements). Biocoordination compounds, bioligands. Biocatalyzers. Oxygen carriers and oxygen transport proteins. Photochemical process. Catalysis and regulation processes. Calcium biominerals and biomineralization.Toxic metals. Application of knowledge of bioinorganic chemistry in pharmacy, chemotherapy (e.g. platinum complexes in cancer therapy) radiodiagnostics, mineral biotechnology, ecology and in other branches of life.

Recommended literature:
1. Shriver D. F., Atkins P. W., Overton T. L., Rourke J.P., Weller M.T., Amstrong F.A.: Shiver & Atkins. Inorganic Chemistry. Oxford University Press, Oxford 2006.
2. Kaim W., Schwederski B.: Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life. Wiley, Chichester 1998.
3. Wilkins P. C., Wilkins R. G.: Inorganic Chemistry in Biology. OCP, Oxford 1997.

Course language:

Course assessment
Total number of assessed students: 243

A	B	C	D	E	FX
41.98	27.98	18.11	4.53	7.0	0.41

Provides: doc. RNDr. Zuzana Vargová, Ph.D.

Date of last modification: 26.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BAM1/00	**Course name:** Biochemical Analytical Methods

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 credits: 4

Recommended semester/trimester of the course: 5.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Written examination

Learning outcomes:

Brief outline of the course:
General principles of analytical biochemistry. Introduction to biomolecules. Application of spectroscopy. Centrifugation and separation. Chromatography of biomolecules. Principles and application of electrophoresis. Application of mass spectrometry. Immunochemical techniques Ions, electrodes and biosensors.

Recommended literature:
D. J. Holme, H. Peck: Analytical Biochemistry, 1998
S. R. Mikkelsen, E. Cortón: Bioanalytical Chemistry, 2004
V. A. Gault, N. H. McClenaghan: Understanding Bioanalytical Chemistry: Principles and applications, 2009

Course language:

Course assessment
Total number of assessed students: 42

A	B	C	D	E	FX
59.52	14.29	19.05	4.76	2.38	0.0

Provides: RNDr. Rastislav Varhač, PhD.

Date of last modification: 26.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ BCHF1/18	**Course name:** Biochémia pre fyzikov I

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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. RNDr. Erik Sedlák, PhD., RNDr. Gabriel Žoldák, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BCHF2/18	**Course name:** Biochémia pre fyzikov II

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 credits: 6

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities: ÚFV/BCHF1/18

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. RNDr. Erik Sedlák, PhD., RNDr. Gabriel Žoldák, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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 credits: 4

Recommended semester/trimester of the course: 5.

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

Course assessment
Total number of assessed students: 157

A	B	C	D	E	FX
22.29	26.11	18.47	23.57	8.28	1.27

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BFBB/18	**Course name:** Biofyzika v biomedicíne a biotechnológiách

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: prof. RNDr. Pavol Miškovský, DrSc., doc. Mgr. Daniel Jancura, PhD., doc. RNDr. Erik Sedlák, PhD., RNDr. Gabriel Žoldák, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ BFSb1/18	**Course name:** Biofyzikálny seminár I
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 credits: 1	
Recommended semester/trimester of the course: 3.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	

Course assessment

Total number of assessed students: 0

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

Provides: doc. Mgr. Daniel Jancura, PhD.
Date of last modification: 05.10.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ BFSb2/18	**Course name:** Biofyzikálny seminár II

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 credits: 1

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ BPO/14	**Course name:** Bachelor 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 credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Required number of credits gained basedon submitting the bachelor thesis.

Learning outcomes:

Brief outline of the course:
Presentation of the bachelor thesis results, answering questions of the reviewer and members of professional commission.

Recommended literature:

Course language:
Slovak or English

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
92.86	3.57	3.57	0.0	0.0	0.0

Provides:

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ BS1/03	**Course name:** Biostatistics

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 credits: 6

Recommended semester/trimester of the course: 3., 5.

Course level: I.

Prerequisities:

Conditions for course completion:
Recognition.
Recognition.

Learning outcomes:
To provide the students with knowledge on basic principles of statistic methods used in biology and their scope of application

Brief outline of the course:
Sources and theoretical background of biostatistics. Basic principles of the probability theory. Descriptive statistics: variables, measures of mean value and variability of data. Theoretical and empirical distributions. Experimental sampling from normal distributions. Testing of hypotheses. One-way and multiple analysis of variance. Tests for multiple comparisons. Regression analysis. Correlations. Non-parametrical methods. Time series. Analysis of quantitative data.

Recommended literature:
Hassard, T. H.: Understanding biostatistics. Mosby Year Book, 1991
Snedecor,G.W., Cochran,W.G.: Statistical methods. The Iowa state university, Ames, 1972.
R.Forthofer, E.S.Lee, M.Hernandez: Biostatistics. Elsevier,Amsterdam..., 2007

Course language:

Course assessment
Total number of assessed students: 181

A	B	C	D	E	FX
3.31	8.84	16.57	21.55	35.36	14.36

Provides: prof. RNDr. Beňadik Šmajda, CSc.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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 credits: 5

Recommended semester/trimester of the course: 6.

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.

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:

Course assessment
Total number of assessed students: 40

A	B	C	D	E	FX
72.5	10.0	12.5	2.5	2.5	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ BSSBF/18	**Course name:** Biofyzika
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 4	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities: ÚFV/MBF1/14 and ÚFV/FCH1/02 and ÚFV/BFB1/14 and ÚFV/EMBF1/18 and ÚFV/EMBF2/18 and ÚFV/EMBF3/18	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	

Course assessment
Total number of assessed students: 0

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

Provides:
Date of last modification: 05.10.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ CYT1/15	**Course name:** Cytology

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 credits: 6

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Practicals graduation (without absence); Two written tests graduation (min. 70 % fruitfulness of each); Oral examination

Learning outcomes:
To provide the students with knowledge of basic principles of cell microscopic and submicroscopic structure and function.

Brief outline of the course:
Levels of living system organization. Characteristics and comparison of prokaryotic and eukaryotic plant and animal cells. Microscopic, submicroscopic and molecular structure and function of individual cell components. Nucleus and cell division.

Recommended literature:
Alberts, B., Bray, D., Lewis, J. et al.: Molecular Biology of the Cell. Garland Publishing Inc., New York, London, 1994

Course language:

Course assessment
Total number of assessed students: 3862

A	B	C	D	E	FX
5.85	15.64	24.52	23.05	26.05	4.89

Provides: RNDr. Rastislav Jendželovský, PhD., RNDr. Zuzana Jendželovská, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ EMBF1/18	**Course name:** Experimentálne metódy biofyziky 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 credits: 3	
Recommended semester/trimester of the course: 3.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	

Course assessment

Total number of assessed students: 0

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

Provides: prof. RNDr. Pavol Miškovský, DrSc.
Date of last modification: 05.10.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ EMBF2/18	**Course name:** Experimentálne metódy biofyziky II

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 credits: 3

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. Mgr. Daniel Jancura, PhD., doc. RNDr. Erik Sedlák, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ EMBF3/18	**Course name:** Experimentálne metódy biofyziky III

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 credits: 3

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. Mgr. Gregor Bánó, PhD., RNDr. Zuzana Naďová, PhD., RNDr. Veronika Huntošová, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ETB1/99	**Course name:** Experimental techniques in Biology

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 4 **Per study period:** 56
Course method: present

Number of credits: 4

Recommended semester/trimester of the course: 4., 6.

Course level: I.

Prerequisities: ÚBEV/CYT1/02 or ÚBEV/CYT1/15

Conditions for course completion:

Learning outcomes:
To provide the students with the knowledge of basic experimental techniques in biology.

Brief outline of the course:
Manipulation with laboratory animals. Narcotizing of the animals. Operating techniques. Basic research methods.

Recommended literature:
Zutphen, L. F. M., Baumans, V., Beynen, A. C.: Principles of Laboratory Animal Science. Elsevier, Amsterdam, 1993

Course language:

Course assessment
Total number of assessed students: 155

A	B	C	D	E	FX
33.55	18.71	18.71	6.45	20.65	1.94

Provides: RNDr. Ján Košuth, PhD., RNDr. Veronika Sačková, PhD., prof. RNDr. Peter Fedoročko, CSc., RNDr. Anna Alexovič Matiašová, PhD., RNDr. Juraj Ševc, PhD., RNDr. Natália Pipová, PhD., Mgr. Vladislav Kolarčik, PhD., RNDr. Rastislav Jendželovský, PhD., RNDr. Terézia Kisková, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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 credits: 6

Recommended semester/trimester of the course: 3.

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:

Course assessment
Total number of assessed students: 74

A	B	C	D	E	FX
17.57	25.68	32.43	13.51	10.81	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of 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:

Course assessment
Total number of assessed students: 365

abs	n
44.38	55.62

Provides: MUDr. Peter Dombrovský, Mgr. Marek Valanský
Date of last modification: 18.08.2017
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ KVM I/11	**Course name:** Quantum Mechanics

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 8

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To become familiar with elementary principles of quantum mechanics and to illustrate its possible applications on selected examples.

Brief outline of the course:
A subject matter, experimental and theoretical foundations of quantum mechanics (QM). Basic axioms of QM. Schrödinger equation and its solution for a square potential well, harmonic oscillator and spherically symmetric potentials. Tunnel effect and over-barrier reflection. Spin and Pauli matrices. Systems of identical particles, bosons, fermions and Pauli exclusion principle.

Recommended literature:
1. Ľ. Tóth, M. Tóthová, Kvantová a štatistická fyzika I, Rektorát Univerzity P. J. Šafárika, 1982. (in Slovak language)
2. Ľ. Skála, Úvod do kvantovej mechaniky, Academia, Praha, 2005. (in Czech language)
3. J. Pišút, L. Gomolčák, Úvod do kvantovej mechaniky, Bratislava 1983. (in Slovak language)
4. W. Greiner, Quantum Mechanics, 4th edition, Springer, Berlin, 2000.
5. A. C. Philips, Introduction to Quantum Mechanics, Wiley, Weinheim, 2003.
6. D. J. Griffiths, Introduction to Quantum Mechanics, Prentice Hall, New Jersey, 1995.

Course language:
EN - english

Course assessment
Total number of assessed students: 70

A	B	C	D	E	FX
27.14	17.14	18.57	11.43	18.57	7.14

Provides: doc. RNDr. Jozef Strečka, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ KVM II/08	**Course name:** Quantum Mechanics II.

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 1 **Per study period:** 42 / 14
Course method: present

Number of credits: 6

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚFV/KVM/08 or ÚFV/KVM I/11

Conditions for course completion:

Learning outcomes:
To become familiar with the approximate methods of quantum mechanics and their applications by theoretical investigations of many-particle quantum systems.

Brief outline of the course:
The stationary and non-stationary perturbation theory for quantum-mechanical systems with a discrete, continuous and discrete-continuous energy spectrum. The special cases of constant, adiabatic and harmonic perturbations. Anharmonic oscillator. The hydrogen atom in the external electric and magnetic field, Stark effect, normal and anomalous Zeeman effect. Ritz variational method and its applications. Many-particle quantum-mechanical systems, atoms and molecules. The helium atom and the hydrogen molecule. Hartree and Hartree-Fok method.

Recommended literature:
1. V. Ilkovič, Kvantová teória II, Scriptum UPJŠ, Košice, 1989. (in Slovak)
2. J. Pišút, L. Gomolčák, Úvod do kvantovej mechaniky, Bratislava 1983. (in Slovak)
3. W. Greiner, Quantum Mechanics, 4th edition, Springer, Berlin, 2000.
4. D. J. Griffiths, Introduction to Quantum Mechanics, Prentice Hall, New Jersey, 1995.

Course language:
EN - english

Course assessment
Total number of assessed students: 90

A	B	C	D	E	FX
34.44	15.56	20.0	10.0	16.67	3.33

Provides: doc. RNDr. Jozef Strečka, PhD., RNDr. Tomáš Lučivjanský, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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 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:

Course assessment
Total number of assessed students: 142

abs	n
41.55	58.45

Provides: Mgr. Peter Bakalár, PhD.
Date of last modification: 18.08.2017
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ LTV/18	**Course name:** Laboratórna technika a výpočty

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 credits: 2

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: Gabriela Fabriciová, RNDr. Zuzana Jurašeková, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ MAN3a/10	**Course name:** Mathematical analysis I for informaticians and physicists

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 3 **Per study period:** 56 / 42
Course method: present

Number of credits: 8

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Continuous assessment is taken the form of small tests and two main tests during the semester. Final evaluation is given by continuous assessment (50%), written and oral part of the exam (50%).

Learning outcomes:
The course provides students with the basics of mathematical analysis necessary to study physics and computer science. The students also learn mathematical culture, notation and mathematical way of thinking and expression.

Brief outline of the course:
1. Introduction - language of mathematics, basics of formal logic.
2. Real numbers and sets - ordering, boundedness, infimum, supremum.
3. Sequences - boundedness, monotonicity, convergence, subsequences.
4. Series - sum, tests for convergence, absolute and relative convergence.
5. Functions of one real variable - fundamental concepts, limits and operations with them.
6. Continuous functions and their properties on the set (interval). Elementary functions.
7. Derivative, differentiability, difference and differential, fundamental theorems of differential calculus.
8. Using differential calculus for the investigation of properties of functions and their behavior.
9. Other applications of derivative - calculation of limits, Taylor polynomials.
10. Power series - radius and range of convergence, properties of the sum of power series, Taylor series.

Recommended literature:
1. B. Mihalíková, J. Ohriska: Matematická analýza 1, vysokoškolský učebný text, UPJŠ v Košiciach, Košice, 2000 (in Slovak).
2. Z. Došlá, J. Kuben: Diferenciální počet funkcí jedné proměnné, vysokoškolský učebný text, Masarykova univerzita v Brne, Brno, 2004 (in Czech).
3. D. Brannan: A First Course in Mathematical Analysis, Cambridge University Press, Cambridge, 2006.
4. K. A. Ross: Elementary Analysis: The theory of Calculus, Springer, New York, 2010.
5. A. Banner: The calculus lifesaver, Princeton university press, Princeton, 2007.

6. B. S. Thomson, J. B. Bruckner, A. M. Bruckner: Elementary real analysis, Prentice Hall (Pearson), Lexington, 2008.
7. J. Stewart: Calculus: Early Transcendentals, Brooks Cole (Thomson), Toronto, 2008.

Course language:
slovak

Course assessment
Total number of assessed students: 935

A	B	C	D	E	FX
7.06	8.24	12.94	15.94	36.79	19.04

Provides: RNDr. Jaroslav Šupina, PhD., RNDr. Lenka Halčinová, PhD.

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MAN3b/10	**Course name:** Mathematical analysis II for informaticians and physicists

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 3 **Per study period:** 56 / 42
Course method: present

Number of credits: 8

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities: ÚMV/MAN3a/10

Conditions for course completion:
Continuous assessment is taken the form of small tests and two main tests during the semester. Final evaluation is given by continuous assessment (50%), written and oral part of the exam (50%).

Learning outcomes:
The course provides students with the basics of mathematical analysis necessary to study physics and computer science. The students also learn mathematical culture, notation and mathematical way of thinking and expression.

Brief outline of the course:
1. Integral calculus of functions of one real variable: a) Indefinite integral - primitive function and its properties, techniques of integration; b) Definite Riemann integral - definition, elementary properties, calculation methods, classes of integrable functions, applications; c) Improper integral.
2. Ordinary differential equations - basic concepts, the first order equations (separable, homogeneous, linear, Bernoulli), linear equations of the second order (also with constant coefficients).
3. Metric space - Euclidean space, some topological properties of points and sets.
4. Function of several real variables - basic concepts, limits and continuity.
5. Differential calculus of functions of several real variables - partial derivative, differentiability and total differential (also higher order), Taylor polynomials, directional derivative, local and global extrema, constrained local extrema.
6. Double (two dimensional) integral - definition, calculation methods, applications.

Recommended literature:
1. L. Kluvánek, I. Mišík, M. Švec: Matematika I, II, SVTL, Bratislava, 1959 (in Slovak).
2. Z. Došlá, O. Došlý: Diferenciální počet funkcí více proměnných, vysokoškolský učebný text, Masarykova univerzita v Brne, Brno, 2003 (in Czech).
3. J. Eliaš, J. Horváth, J. Kajan: Zbierka úloh z vyššej matematiky 2, 3, 4, Alfa, Bratislava, 1971 (in Slovak).
4. J. C. Robinson: An introduction to ordinary differential equations, Cambridge University Press, Cambridge, 2004.
5. R. E. Williamson, H. F. Trotter: Multivariable mathematics, Prentice Hall (Pearson), Upper Saddle River, 2004.

6. B. S. Thomson, J. B. Bruckner, A. M. Bruckner: Elementary Real Analysis, Prentice Hall (Pearson), Lexington, 2008.
7. J. Stewart: Calculus: Early Transcendentals, Brooks Cole (Thomson), Toronto, 2008.

Course language:
Slovak

Course assessment
Total number of assessed students: 455

A	B	C	D	E	FX
8.13	8.35	11.87	18.9	38.68	14.07

Provides: Mgr. Jozef Kiseľák, PhD., RNDr. Jaroslav Šupina, PhD.

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MBB1/18	**Course name:** Molekulová a bunková biológia 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 credits: 5

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. RNDr. Katarína Štroffeková, PhD., RNDr. Zuzana Naďová, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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 credits: 4

Recommended semester/trimester of the course: 4.

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

Course assessment
Total number of assessed students: 23

A	B	C	D	E	FX
56.52	30.43	8.7	0.0	4.35	0.0

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/MFY/12	**Course name:** Mathematical Physics

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 1 **Per study period:** 42 / 14
Course method: present

Number of credits: 6

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚMV/FRPb/19

Conditions for course completion:

Learning outcomes:
The goal of this course is to continue in the study of mathematical analysis with emphasize on the special techniques used in advanced branches of physics.

Brief outline of the course:
Sturm-Liouville problem. Legendre's equation and polynomials. Solution of Legendre's equation. Properties of Legendre's polynomials. Operators in curvilinear coordinates. Lamé's coefficients. Solution of Laplace's equation in spherical coordinates. Properties of spherical functions.
Special functions: Hermite's polynomials, Laguerre's polynomials, Bessel's functions, Gamma function.
Laplace transform. Classification of the second order linear differential equations.

Recommended literature:
J. Ray Hanna, J. H. Rowland : Fourier Series, Transforms, and Boundary Value Problems.
Tai L. Chow : Mathematical Methods for Physicists.
J. Goldberg, M. Potter : Differential Equations.
G. B. Arfken , H. J. Weber : Mathematical Methods for Physicists, Harbourt Academic Press 2011.

Course language:

Course assessment
Total number of assessed students: 60

A	B	C	D	E	FX
26.67	20.0	13.33	13.33	26.67	0.0

Provides: RNDr. Tomáš Lučivjanský, PhD., RNDr. Marián Jurčišin, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ MKV/15	**Course name:** Mikrobiológia a základy virológie

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 credits: 5

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:
Attendance of practicals (at least 90%), 2 written examinations during semester, final oral examination

Learning outcomes:
Students will obtain a basic informations on viruses, prokaryotic and eukaryotic microorganisms, their cytology, physiology, genetics, ecology, classification, and importance . Information on basic methods for studying microorganisms will be provided.

Brief outline of the course:
Viruses, prokaryotic and eukaryotic microorganisms, their cytology, physiology, genetics, ecology, classification. The importance of microorganisms for humans and environment.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 1339

A	B	C	D	E	FX
21.73	12.85	18.15	19.94	22.78	4.56

Provides: doc. RNDr. Peter Pristaš, CSc., RNDr. Mariana Kolesárová, PhD., RNDr. Lenka Maliničová, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MSA1/03	**Course name:** Methods of Structural Analysis

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 credits: 7

Recommended semester/trimester of the course: 6.

Course level: I., II., III.

Prerequisities:

Conditions for course completion:
Final written exams form both topics:EM and X-ray diffractometry - 25%
Experimental projects from both topics: ligt and electron microscopy and X-ray diffractometry - 75%

Learning outcomes:
The course is oriented on modern methods of structural analysis of metals. Main topics are: optic microscopy, electron microscopy (TEM, SEM),electron microprobe analysis and X-ray diffractometry.

Brief outline of the course:
Optic microscopy. Electron microscopy: Electron beam instruments, Electron optics, Electron lences and deflection systems, Transmission electron microscopy - principle and construction. Electron – specimen interactions. Electron diffraction. Kikuchy lines. Scanning electron microscopy – principle and cnstrucion. Scanning transmission electron microscopy. High Voltage electron microscopy. Electron microprobe analysis: WDX spectrometer, EDX spectrometer, Auger electron spectrometer. Self-emision microscopy. Convergent beam diffraction.
X-ray diffractometry: Scattering of x-rays, Neutrons and neutron scattering, CW - diffractometer, Ewald´s sphere, Diffraction on powder samples, The main characteristics of powder diffraction pattern, Structure factor, Ocupation factor, Atomic displacement factor, Peak intensity, shape and symmetry, Sherrer equation. Peak profile, Rietweld method. Qualitative phase analysis, parameters of elementary cell, Profile analysis of diffraction peak and interpretation of profile analysis.

Recommended literature:
1.S. Amelincks, D.van Dyck, J. van Landyut, Electron Microscopy – Principles and Fundamentals of Electon Microscopy, VCH, 1997.
2.M.H. Loretto, Electrom beam analysis of materials. Springer, 2002.
3.Fundamentals of Powder Diffraction and Structural Characterization of Materials, Vitalij K. Pecharsky & Peter Y. Zavalij , Kluwer Academic Publishers, 2003.
4.Structure Determination from Powder Diffraction Data, Edited by W.I.F. David, K. Shankland, L.B. McCusker, C. Bärlocher, Oxford University Press, 2006

Course language:
English

Course assessment
Total number of assessed students: 65

A	B	C	D	E	FX	N	P
36.92	26.15	10.77	1.54	0.0	0.0	0.0	24.62

Provides: prof. RNDr. Pavol Sovák, CSc., Ing. Karel Saksl, DrSc., Ing. Vladimír Girman, PhD.

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MSB/10	**Course name:** System Biology Modeling

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 0 **Per study period:** 28 / 0
Course method: present

Number of credits: 3

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:
Solving intermediate motivating challenges given at the lectures.
Exam.

Learning outcomes:
To provide an overview of the computational techniques and achievable results in the emerging field of systems biology.

Brief outline of the course:
Basics of molecular modeling. Physical structure of biopolymers. Foldamers, Levinthal paradox and Anfinsen principle. Essentials of molecular modeling and molecular simulations. Examples of procedures and their results.
Biological polymers as sequences. Sequence comparision.
Biological databases of sequences, acces and work. BLAS, FASTA, scoring matrices. Sugar code as an example of non-linear code. Examples of use and results.
Molecular interaction networks, modeling of reaction kinetics. Application of graph-based approaches. Stochastic and deterministic modeling. Typical examples of use. Outlines and perspectives of systems biology and systems medicine. Chalenges of synthetic biology.

Recommended literature:
Alon, Uri. *An Introduction to Systems Biology: Design Principles of Biological Circuits*. 1st ed. Chapman and Hall/CRC, 2006.
Campbell, A. Malcolm, and Laurie J. Heyer. *Discovering Genomics, Proteomics and Bioinformatics*. 2nd ed. Benjamin Cummings, 2006.
Gabius, Hans-Joachim. *The Sugar Code: Fundamentals of Glycosciences*. Wiley-VCH, 2009.

Course language:

Course assessment
Total number of assessed students: 171

A	B	C	D	E	FX
94.15	4.68	1.17	0.0	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 01.03.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MTBF/18	**Course name:** Moderné trendy v biofyzike
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 credits: 2	
Recommended semester/trimester of the course: 1.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	

Course assessment

Total number of assessed students: 0

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

Provides: prof. RNDr. Pavol Miškovský, DrSc., doc. Mgr. Daniel Jancura, PhD., doc. RNDr. Erik Sedlák, PhD., RNDr. Gabriel Žoldák, PhD.
Date of last modification: 05.10.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MTFa/15	**Course name:** Mathematics I for physicists

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 credits: 5

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Two written tests and one homework with excercises from the whole semester. The final evaluation is given according to the results from the semester and in view of the results of the written final test.

Learning outcomes:
To obtain basic knowledge on functions of one variable and their properties; to be able to apply the theory in concrete excercises.

Brief outline of the course:
Functions, basic properties. Elementary functions. Continuous functions. Limits. Derivation and its geometric aplications. Theorems about continuous functions. Behaviour of functions. Indefinite integrals, basic methods of integration. Definite integral and its applications.

Recommended literature:
S. Lang: A First Course in Calculus, Springer Verlag, 1998

Course language:
Slovak

Course assessment
Total number of assessed students: 312

A	B	C	D	E	FX
8.33	8.33	14.1	19.55	29.49	20.19

Provides: doc. RNDr. Roman Soták, PhD., RNDr. Erika Vojtková

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MTFb/15	**Course name:** Mathematics II for physicists

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 credits: 4

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚMV/MTFa/15

Conditions for course completion:
Two written tests and one homework with excercises from the whole semester, final test.
According to the results from the semester and in view of the results of the written final test.

Learning outcomes:
To develop acquired knowledge of mathematical analysis with knowledge on linear algebra and functions of more variables. To learn to solve basic types of differential equations and know how to use them to model real-world phenomena. To learn to solve problems about infinite series.

Brief outline of the course:
System of linear algebraic equations, determinants. Functions of more variables, continuity and limits, partial derivations, local extremes of functions of two variables. Some types of differential equations. Series, functional series, Taylor and MacLaurin series.

Recommended literature:
1. S. Lang: A First Course in Calculus, Springer Verlag, 1998
2. Huťka V., Benko E., Ďurikovič V.: Matematika, Alfa, Bratislava 1991.
3. Došlá, Z.: Matematika pro chemiky, 1.díl. Masarykova univerzita, Brno, 2010.

Course language:
Slovak

Course assessment
Total number of assessed students: 178

A	B	C	D	E	FX
11.24	16.29	12.36	25.84	29.21	5.06

Provides: doc. RNDr. Stanislav Lukáč, PhD., RNDr. Anton Hovana

Date of last modification: 27.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KGER/ NJKG/07	**Course name:** Communicative Grammar in German Language
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 credits: 2	
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:	

Course assessment

Total number of assessed students: 48

A	B	C	D	E	FX
54.17	12.5	10.42	4.17	10.42	8.33

Provides: PaedDr. Ingrid Puchalová, PhD., Mgr. Barbora Molokáčová
Date of last modification: 25.08.2017
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ NUM/10	**Course name:** Numerical Methods

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 credits: 4

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
Continuous evaluation is based on students' activity in the classroom and work on assignments.
Evaluation

Learning outcomes:
To acquaint students with basic numerical methods of calculus and algebra, which are necessary for the subsequent course of computational physics.

Brief outline of the course:
Computational solutions of physical problems and computational errors. Approximation and interpolation of functions. Fast Fourier transform. Linear systems of equations - direct and itterative methods. Nonlinear systems of equations. Conditions of convergence and assesment of error. Numerical derrivatives and quadrature. Matrix operations, determinants and inverse matrices. Eigenvalues and eigenvectors - partial and complete problem.

Recommended literature:
1. C. Pozrikidis: Numerical Computation in Science and Engineering, Oxford University Press, 1998.
2. R.W. Hamming: Numerical Methods for Scientists and Engineers, Dover, 1973.
3. A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.

Course language:

Course assessment
Total number of assessed students: 99

A	B	C	D	E	FX
16.16	15.15	24.24	24.24	14.14	6.06

Provides: doc. RNDr. Milan Žukovič, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ OCHB/10	**Course name:** Organic Chemistry

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 1 **Per study period:** 42 / 14
Course method: present

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚCHV/VACH/10

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:
1. on-line ppt presentation in MOODLE, moodle science.upjs.sk
2. Organic Chemistry, Clayden, Greeves Warren & Wothers, Oxford University Press, 2010
3. Organic Chemistrz, Solomon, Willey, 2009

Course language:

Course assessment
Total number of assessed students: 210

A	B	C	D	E	FX
19.05	20.95	34.29	19.52	5.71	0.48

Provides: prof. RNDr. Jozef Gonda, DrSc., doc. RNDr. Miroslava Martinková, PhD., RNDr. Slávka Hamuľaková, PhD.

Date of last modification: 26.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PBC2/99	**Course name:** Biochemistry Practical

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 4 **Per study period:** 56
Course method: present

Number of credits: 4

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
2 written tests
Protocols + 75 % continuous evaluation.

Learning outcomes:
To allow students to get practical experience in experimental techniques and methods, currently used in a biochemical research: UV/VIS spectrophotometry, thin layer chromatography (TLC), gel electrophoresis, isolation of macromolecules and substances from biological materials and their quantitative and qualitative determination.

Brief outline of the course:
The most important biochemical laboratory methods. The qualitative tests for amino acids and proteins. Time-dependent course of enzyme-catalyzed reaction: determination of enzymatic activity, determination of the first order rate constant, calculations of math models (examples), effect of a substrate concentration on initial rate of reaction, determination of Km and Vmax for urease. Isolation and detection of nucleic acids.

Recommended literature:
Sedlák, Danko, Varhač, Paulíková, Podhradský: Practical exercises from biochemistry, 2007, http://kosice.upjs.sk/~kbch/document.php?name=pbc&lang=sk

Course language:

Course assessment
Total number of assessed students: 754

A	B	C	D	E	FX
59.28	24.67	9.68	4.51	1.59	0.27

Provides: doc. RNDr. Mária Kožurková, CSc., RNDr. Nataša Tomášková, PhD., RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., RNDr. Petra Krafčíková, PhD., RNDr. Eva Konkoľová, PhD.

Date of last modification: 26.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PEMBF1/18	**Course name:** Praktikum k experimentálnym metódam biofyziky I

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 credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚFV/EMBF1/18

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: RNDr. Gabriela Fabriciová, PhD., RNDr. Zuzana Jurašeková, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PEMBF2/18	**Course name:** Praktikum k experimentálnym metódam biofyziky II

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 credits: 2

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities: ÚFV/EMBF2/18

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. RNDr. Erik Sedlák, PhD., RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PEMBF3/18	**Course name:** Praktikum k experimentálnym metódam biofyziky III

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 credits: 2

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚFV/EMBF3/18

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. Mgr. Gregor Bánó, PhD., RNDr. Zuzana Naďová, PhD., RNDr. Veronika Huntošová, PhD.

Date of last modification: 05.10.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: CJP/ PFAJ4/07	**Course name:** English Language of Natural Science

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 credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:
Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most.
Continuous assessment: 2 credit tests (presumably in weeks 6 and 13) and academic presentation in English.
In order to be admitted to the final exam, a student has to score at least 65 % as a sum of both credit tests.
The exam test results represent 50% of the final grade for the course, continuous assessment results represent the other 50% of the final grade.
The final grade for the course will be calculated as follows:
A 93-100, B 86-92, C 79-85, D 72-78, E 65-71, FX 64 and less.

Learning outcomes:
Enhancement of students' language skills (speaking, writing, reading and listening comprehension) in English for specific purposes and development of students' language competence (familiarization with selected phonological, lexical and syntactic phenomena), improvement of students' pragmatic competence (familiarization with selected language functions) and improvement of presentation skills at B2 level (CEFR) with focus on terminology of English for natural science.

Brief outline of the course:
ANGLICKÝ JAZYK PRE GEOGRAFOV:
Veda a výskum. Odbor geografia.
Planéta Zem. Naša slnečná sústava.
Zemetrasenia, Sopečná činnosť.
Svetové oceány a ľadovce.
Životné prostredie a geografia.
Počasie a klíma.
ANGLICKÝ JAZYK PRE EKOLÓGOV:
Veda a výskum. Odbor ekológia.
Životné prostredie. Znečistenie a dôsledky.
Sopečná činnosť, zemetrasenia.
Great Pacific Garbage Patch.

Globálne otepľovanie a dôsledky. Ľadovce.
Počasie a klíma. Búrky, hurikány, tsunami.
Život na Zemi. Ohrozené rastlinné a živočíšne druhy.
ANGLICKÝ JAZYK PRE BIOLÓGOV:
veda a výskum, odbor biológia.
morfológia rastlín, koreň.
stonka, list.
rozmnožovanie rastlín, kvet.
biológia človeka - telesné sústavy.
slovná zásoba z oblasti botanickej a zoologickej nomenklatúry.
ANGLICKÝ JAZYK PRE MATEMATIKOV:
Veda a výskum, odbor matematika.
čísla a tvary v matematike.
Elementárna algebra.
Elementárna geometria.
Výpočty v matematike.
Pytagoras, Pytagorova veta.
Grafy a diagramy.
Štatistika.
ANGLICKÝ JAZYK PRE FYZIKOV
Veda a výskum, odbor fyzika.
Atómy a molekuly.
Hmota a jej premeny.
Elektrina, jej využitie.
Zvuka, jeho prenos.
Svetlo.
Solárny systém.
Matematické operácie.
ANGLICKÝ JAZYK PRE CHEMIKOV:
Veda a výskum, odbor chémia.
História, Každodenná chémia.
Laboratórium a jeho vybavenie.
Periodická tabuľka.
Hmota a jej premeny.
Životné prostredie a chémia.
ANGLICKÝ JAZYK PRE INFORMATIKOV:
Veda a výskum, informatika.
Život s počítačom.
Typický PC.
Zdravie a bezpečnosť, ergonomika.
Programovanie.
Emailovanie.
Cybercrime.
Trendy budúcnosti.

Recommended literature:

study materials provided by the course instructor
Royds-Irmak, D.E. Beginning Scientific English. Nelson, 1975.
Velebná, B. English for Chemists. ffweb.ff.upjs.sk/vyuka//
Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.

Powel, M.: Dynamic Presentations. CUP, 2010.
Armer, T.: Cambridge English for Scientists. CUP, 2011.
Wharton J.: Academic Encounters. The Natural World. CUP, 2009.
Murphy, R.: English Grammar in Use. Cambridge University Press, 1994.
Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.
P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.
https://worldservice/learningenglish, https://spectator.sme.sk

Course language:

Course assessment
Total number of assessed students: 2443

A	B	C	D	E	FX
34.55	25.83	17.6	10.89	8.8	2.33

Provides: Mgr. Zuzana Naďová, Mgr. Lenka Klimčáková

Date of last modification: 06.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ PFAJAKA/07	**Course name:** Academic English

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 credits: 2

Recommended semester/trimester of the course:

Course level: I., II., N

Prerequisities:

Conditions for course completion:
Active classroom participation, 2 absences tolerated (4x45 min.) tolerated. 2 tests (5th/6th week and 12th/13th week), no retake. Minipresentation on chosen topic. Final evaluation- average assessment of tests and presentation. Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less

Learning outcomes:

Brief outline of the course:

Recommended literature:
Seal B.: Academic Encounters, CUP, 2002
T. Armer :Cambridge English for Scientists, CUP 2011
M. McCarthy M., O´Dell F. - Academic Vocabulary in Use, CUP 2008
Zemach, D.E, Rumisek, L.A: Academic Writing, Macmillan 2005
Olsen, A. : Active Vocabulary, Pearson, 2013
www.bbclearningenglish.com
Cambridge Academic Content Dictionary, CUP, 2009

Course language:
English language, level B2 according to CEFR.

Course assessment
Total number of assessed students: 344

A	B	C	D	E	FX
30.81	23.55	15.99	11.05	7.27	11.34

Provides: Mgr. Zuzana Naďová

Date of last modification: 06.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ PFAJGA/07	**Course name:** Communicative Grammar in English

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 credits: 2

Recommended semester/trimester of the course:

Course level: I., II., N

Prerequisities:

Conditions for course completion:
Active classroom participation (max. 2x90 min. absences tolerated). 2 test (5th/6th and 12/13th week), no retake. Final evaluation- average assessment of tests. Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less.

Learning outcomes:

Brief outline of the course:

Recommended literature:
Misztal M.: Thematic Vocabulary, Fragment, 1998
McCarthy, O'Dell: English Vocabulary in Use, 1994
Alexander L.G.: Longman English Grammar, Longman, 1988
Jones I. - Communicative Grammar Practice, CUP, 1992
Vince M.: Macmillan Grammar in Context, Macmillan, 2008
www.bbclearningenglish.com
Gráf T., Peters S.: Time to practise, Polyglot, 2007

Course language:

Course assessment
Total number of assessed students: 394

A	B	C	D	E	FX
39.34	18.53	17.01	8.88	6.09	10.15

Provides: Mgr. Lenka Klimčáková

Date of last modification: 06.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ PFAJKKA/07	**Course name:** Communicative Competence in English

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 credits: 2

Recommended semester/trimester of the course:

Course level: I., II., N

Prerequisities:

Conditions for course completion:
Active participation in class and completed homework assignments. Students are allowed to miss two classes at the most.
2 credit tests (presumably in weeks 6/7 and 12/13) and short academic presentations in English on selected topics.
Final grade will be calculated as follows: A 93-100 %, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64 % and less.

Learning outcomes:
Uplatnenie a aktívne používanie svojich teoretických vedomostí v praktických komunikačných situáciách. Zdokonalenie jazykových vedomostí a zručností študenta, rečovej, pragmatickej a vecnej kompetencie, predovšetkým zlepšujú komunikáciu, schopnosťprijímať a formulovať výpovede, efektívne vyjadrovať svoje myšlienky ako aj orientovať sa v obsahovom pláne výpovede. Precvičovanie rečových intencií kontaktných (napr. pozdravy, oslovenia, pozvanie, oslovenie), informatívnych (napr. získavanie a podávanie informácií, vyjadrenie priestorových a časových vzťahov), regulačných (napr. prosba, poďakovanie, zákaz, pochvala, súhlas, nesúhlas) a hodnotiacich (napr. vyjadrenie vlastného názoru, stanoviska, želania, emócií). Výsledkom budovania praktickej jazykovej kompetencie majú byť vedomosti a zručnosti zodpovedajúce požiadavkám a kritériám dokumentu Spoločný európsky referenčný rámec pre vyučovanie jazykov.

Brief outline of the course:
Rodina, jej formy a problémy
Vyjadrovanie pocitov a dojmov
Dom, bývanie a budúcnosť
Formy a dialekty v anglickom jazyku
Život v meste a na vidieku
Kolokácie a idiomy, zaužívané slovné spojenia
Prázdniny a sviatky vo svete
Životné prostredie a ekológia
Výnimky zo slovosledu
Frázové slovesá a ich použitie
Charakteristiky neformálneho diškurzu

Recommended literature:

www.bbclearningenglish.com
McCarthy M., O'Dell F.: English Vocabulary in Use, Upper-Intermediate. CUP, 1994.
Misztal M.: Thematic Vocabulary. SPN, 1998.
Fictumova J., Ceccarelli J., Long T.: Angličtina, konverzace pro pokročilé. Barrister and Principal, 2008.
Peters S., Gráf T.: Time to practise. Polyglot, 2007.
Jones L.: Communicative Grammar Practice. CUP, 1985.
Alexander L.G.: Longman English Grammar. Longman, 1988.

Course language:

English language, B2 level according to CEFR

Course assessment

Total number of assessed students: 220

A	B	C	D	E	FX
36.36	21.82	20.45	10.45	7.27	3.64

Provides: Mgr. Zuzana Naďová

Date of last modification: 06.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ POF1a/99	**Course name:** Computational Physics I

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 credits: 4

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚFV/NUM/10

Conditions for course completion:
Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.

Learning outcomes:
To teach students to use computer as a tool of modeling of physical reality.

Brief outline of the course:
Introduction to dynamical systems. Numerical solution of ordinary differential equations (ODE) with initial value. Boundary value problems for ODE. Discrete schemes for partial differential equations (PDE). Numerical solution of PDE. Finite difference methods, consistency, convergence, stability. Eliptic and parabolic PDE. Introduction to Monte Carlo (MC) method and applicactions in statistical physics. MC simulations of lattice spin systems and stochastic processes.

Recommended literature:
1. C. Pozrikidis: Num. Comp. in Science and Engineering, Oxford Univ. Press, 1998.
2. A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.
3. D. P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge Univ. Press, 2000.
4. B. A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis, http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf
5. W. Janke: Lectures on Ising model, http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html

Course language:

Course assessment
Total number of assessed students: 106

A	B	C	D	E	FX	N	P
33.02	17.92	9.43	17.92	14.15	2.83	0.0	4.72

Provides: doc. RNDr. Milan Žukovič, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ SPBFb1/18	**Course name:** Semestrálna práca I
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 4	
Recommended semester/trimester of the course: 5.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 05.10.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ SPBFb2/18	**Course name:** Semestrálna práca II
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 6	
Recommended semester/trimester of the course: 6.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 0	
abs	n
0.0	0.0
Provides:	
Date of last modification: 05.10.2018	
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SVK/13	**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 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:

Course assessment
Total number of assessed students: 40

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

Provides:

Date of last modification: 26.09.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TDF1/99	**Course name:** Thermodynamics and Statistical Physics

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
State parameters.Empirical temperature.The priciples of termodnamics.
Absolute temperature and entropy.Phase space.Liouville theorem.Density matrix.Statistical ensebles.Bose and Fermi gases.
Literature: P.T.Landsberg,Thermodynamics,Interscience,1961.
L.D.Landau,and E.M.Lifshitz,Statisticalphysics,
Pergamon Press,Oxford,1977.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 151

A	B	C	D	E	FX
57.62	15.89	19.87	4.64	1.99	0.0

Provides: prof. RNDr. Michal Jaščur, CSc.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TEP1/03	**Course name:** Theory of the Electromagnetic Field

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 1 **Per study period:** 42 / 14
Course method: present

Number of credits: 5

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚFV/VFM1b/15 or ÚFV/VF1b/03

Conditions for course completion:
Two tests to deal with specific tasks theory of the electromagnetic field.
Examination.

Learning outcomes:
To acquaint students with principles of a theory of the electromagnetic field.

Brief outline of the course:
Maxwell equations in vacuum. Scalar and vector potentials. Conservation laws. Electrostatic field. Static magnetic field. Maxwell equations in macroscopic media. Quasistatic electromagnetic field. Electromagnetic waves. Radiation of electromagnetic waves.

Recommended literature:
1. Jackson J.D.: Classical Electrodynamics, John Wiley, New York, 1975.
2. Rao N.N.: Basic Electromagnetics with Applications, Prentice-Hall, New Jersey, 1972.
3. Greiner W.: Classical Electrodynamics, Springer-Verlag, New York, 1998.

Course language:
1. Slovak,
2. English

Course assessment
Total number of assessed students: 279

A	B	C	D	E	FX
27.6	7.89	16.49	23.3	16.49	8.24

Provides: prof. RNDr. Andrej Bobák, DrSc., RNDr. Tomáš Lučivjanský, PhD.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TME1/03	**Course name:** Theoretical Mechanics

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 credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: I.

Prerequisities: ÚFV/VF1a/12

Conditions for course completion:
Two tests to deal with specific tasks mechanics.
Examination.

Learning outcomes:
To acquaint students with principles of the theoretical mechanics.

Brief outline of the course:
Mechanics of systems with constraints. Principle of virtual work and d'Alembert's principle. Lagrange's equations of motion. Hamilton's principle. Hamilton's equations. Kinematics and dynamics of rigid bodies. Euler's equations. Continuum mechanics. Deformation and stress tensors. General form of Hooke's law. Equilibrium of fluids. Motion of ideal and viscous fluids.

Recommended literature:
1. Meirovitch L.: Methods of Analytical dynamics, McGraw-Hill, New York, 1970.
2. Taylor T.T.: Mechanics: Classical and Quantum, Pergamon Press, Oxford, 1976.
3. Strelkov S.P.: Mechanics, Mir Publishers, Moscow, 1985.
4. Greiner W.: Classical Mechanics, Springer-Verlag, Berlin, 2010.
5. Goldstein H.: Classical Mechanics, Addison-Wesley, London, 1970.
6. Barger V., Olsson M.: Classical Mechanics: A Modern Perspective, McGraw-Hill, London, 1973.

Course language:
1. Slovak,
2. English

Course assessment
Total number of assessed students: 164

A	B	C	D	E	FX
31.71	12.8	15.85	16.46	9.76	13.41

Provides: prof. RNDr. Andrej Bobák, DrSc.

Date of last modification: 23.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of credits: 2

Recommended semester/trimester of the course: 1.

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

Prerequisities:

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

Learning outcomes:
Learning outcomes:
Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.

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, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.
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:

Course assessment
Total number of assessed students: 11672

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.42	0.01	0.0	0.0	0.0	0.03	7.59	3.96

Provides: Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Ing. Iveta Cimboláková, PhD.
Date of last modification: 18.08.2017
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of credits: 2

Recommended semester/trimester of the course: 2.

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

Prerequisities:

Conditions for course completion:
Conditions for course completion:
Final assessment and active participation in classes - min. 75%.

Learning outcomes:
Learning outcomes:
Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.

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, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.
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:

Course assessment
Total number of assessed students: 10971

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.37	0.57	0.02	0.0	0.0	0.05	10.13	3.86

Provides: Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Ing. Iveta Cimboláková, PhD.
Date of last modification: 18.08.2017
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of credits: 2

Recommended semester/trimester of the course: 3.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 6910

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
89.84	0.04	0.0	0.0	0.0	0.03	4.23	5.86

Provides: Mgr. Marcel Čurgali, Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Ing. Iveta Cimboláková, PhD.

Date of last modification: 18.08.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of credits: 2

Recommended semester/trimester of the course: 4.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 5045

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.09	0.3	0.04	0.0	0.0	0.0	6.82	7.75

Provides: Mgr. Marcel Čurgali, Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Ing. Iveta Cimboláková, PhD.

Date of last modification: 18.08.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ UAD/10

Course name: Introduction to data analysis

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

Number of credits: 2

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Test and individual project work.
Oral presentation of the individual project work.

Learning outcomes:
To know the basic purpose of statistical data analysis, its methods and statistical thinking and understand its importance for science and practical life.
To understand elementary statistical concepts.
To gain experience in handling real data using spreadsheet Excel and statistical software R.

Brief outline of the course:
1. Introduction (the basic philosophy and aim of statistical data analysis, descriptive and inductive statistics)
2. Collecting Data (types of data, random sample, randomized experiment)
3. Handling Data (visualization, summarizing – measures of center, measures of variability, skewness and kurtosis, relationships in data – introduction to regression and correlation)
4. Statistical inference (elementary view into estimation and testing hypothesis)

Recommended literature:
1. Anděl, J.: Statistické metody, Matfyzpress, Praha, 1998 (in Czech)
2. Rossman, A.J. et al.: Workshop Statistics: Discovery with Data and Fathom, 3rd ed. Wiley, 2009
3. Utts, J.M.: Seeing Through Statistics, 4th ed., Thomson Brooks/Cole, Belmont, 2014
4. Utts, J.M., Heckard R.F.: Mind on Statistics, 5th ed. Thomson Brooks/Cole, Belmont, 2014
5. Zvára, K., Štěpán, J.: Pravděpodobnost a matematická statistika, Matfyzpress, Praha, 2001 (in Czech)

Course language:
Slovak

Course assessment
Total number of assessed students: 272

A	B	C	D	E	FX
29.41	27.21	30.51	11.76	0.74	0.37

Provides: doc. RNDr. Ivan Žežula, CSc., RNDr. Martina Hančová, PhD.
Date of last modification: 27.02.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ UPF1/12	**Course name:** Introduction to Computational Physics

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 credits: 4

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Elaboration of microreferat on given topics.
Exam and discussion of the implementation of the given project.

Learning outcomes:
The aim of the lecture is to provide students with the physical background of the computational processes in conventional computers, as well as to provide less conventional possibilities to implement computational processes using deeper knowledge of physical processes.

Brief outline of the course:
Physical processes utilised in contemporary computers. Computational processes / thermodynamics point of view. Physical limits of current computer technologies (Moore, Amdahl laws
. Computer modeling and physical reality. Computational complexity and paralelism. Distributed computing. Alternative methods of computation (analogue , optical processors, DNA computing, quantum computing).

Recommended literature:
Actual literature provided by lecturer.

Course language:

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
85.19	11.11	0.0	0.0	3.7	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: Dek. PF UPJŠ/USPV/13	**Course name:** Introduction to Study of Sciences
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week: Per study period:** 12s / 3d **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course: 1.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 1356	

abs	n
88.86	11.14

Provides:	
Date of last modification: 19.02.2018	
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VCHU/15	**Course name:** General Chemistry

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities: ÚCHV/CHV1/99

Conditions for course completion:
Written test in the middle and the end of the semester.
Oral examination.

Learning outcomes:
To provide students with knowledge of atoms and molecules their electronic structure, theories of chemical bonds, physical properties of elements and compounds.

Brief outline of the course:
Main terms used in chemistry. Atoms – models of atoms, electron configuration, chemical periodicity and its effect on the properties of elements, radioactivity. Chemical bonds and intermolecular interactions. Chemical structure and physical properties of matter. State of matter. Solutions. Chemical equilibrium. Basis of chemical thermodynamics and chemical kinetics. Classification of chemical reactions. Electrochemistry.

Recommended literature:
1. Atkins P., Jones L.: Chemical Principles, 2nd ed., Freeman, New York 2002.
2. Russel J.B.: General Chemistry, 2nd ed., McGraw Hill, London 1992.

Course language:

Course assessment
Total number of assessed students: 150

A	B	C	D	E	FX
16.0	24.0	39.33	12.67	8.0	0.0

Provides: prof. RNDr. Vladimír Zeleňák, PhD.

Date of last modification: 26.02.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ VF1a/12	**Course name:** General Physics I

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Monitoring tests during the calculus lessons
1. in the 6th week
2.in the 12th week
Final assessment is based on th results of :
- oral examination
assessment of the calculus lessons (written tests, overall performance during the lessons)

Learning outcomes:
Basic knowledge about the mechanics, molecular physics and thermodynamics.

Brief outline of the course:
Basic knowledge of the calculus, vector algebra. Standards and units. Kinematics. Dynamics. The principle of relativity in the classical mechanics. Gravitation. Mechanics of many-particle systems. The motio of rigid bodies. Deformation, elasticity. Mechanics of fluids and gases. Laws of ideal gases. Kinetic theory. The thermodynamic laws. Statistical character of the second law. Entropy. Molecular phenomena in liquids and solids. Phase transitions.

Recommended literature:
Hajko V., Daniel-Szabó J.: Základy fyziky, VEDA, Bratislava 1983.
Veis Š., Maďar J., Martišovits V.: Všeobecná fyzika I., Mechanika a molekulová fyzika, ALFA Bratislava, 1987.
Fuka J., Široká M.: Obecná fyzika I / skriptum /, PF Univ. Palackého, Olomouc 1983.
Hlavička A., a kol.: Fyzika pre pedagogické fakulty, SPN, Praha 1971.
Hajko V., a kol.:Fyzika v príkladoch, ALFA Bratislava 1983.
Ilkovič D.: Fyzika, SVTL Bratislava, 1962.
Slaviček V., Wagner J.: Fyzika pro chemiky, SNTL Praha 1971.
Krempaský J.: Fyzika, ALFA Bratislava 1982.

Course language:
Slovak

Course assessment
Total number of assessed students: 266

A	B	C	D	E	FX
24.81	16.54	20.68	13.91	16.54	7.52
Provides: doc. RNDr. Zuzana Ješková, PhD.					
Date of last modification: 01.03.2018					
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ VF1b/03	**Course name:** General Physics II

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚFV/VF1a/12

Conditions for course completion:
Test.
Oral examination.

Learning outcomes:
To obtain a general view on basic electric magnetic phenomena and ability to solve basic problems of this subject.

Brief outline of the course:
Electric field in the free space. Work of the forces in the electrostatic field. Electrostatic field and steady current. Current in electrolytes, semiconductors, gasses and vacuum. Thermoelctric effects. Magnetic field in the free space. The interaction of moving charges with the electric current. Quasi steady electric field. Electromagnetic induction. Energy of magnetic field. AC current and circuits with ac current. Multiphase AC current. Rotating magnetic field. Electric effects in the substances. Magnetic properties of the substancies. Magnetic polarization. Diamagnetism and paramagnetism, Magnetic ordering. Ferromagnetism.

Recommended literature:
I. S. Grant, W.R. Phillips, Electromagnetism, John Wiley&Sons, Ltd, England, 1990

Course language:
english

Course assessment
Total number of assessed students: 310

A	B	C	D	E	FX
33.55	15.81	15.81	11.94	11.29	11.61

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Erik Čižmár, PhD.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ VF1c/12	**Course name:** General Physics III

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities: ÚFV/VF1b/03

Conditions for course completion:
Exam+ 2 succesfull test from seminars

Learning outcomes:
The objective is to acquaint the students with the basis of oscilations, waves and optics.

Brief outline of the course:
Undamped oscilations, Mathematical, Physical and Torsional pendulum, Damped oscilations, Fourier transformation, Forced oscilations. Waves, their generation, waves equation.Interference. Huyghens principle. Reflection, difraction. Doppler effect. Waves speed in materials. Acoustics. Geometrical optics. Mirrors, lens. Fotometry.
Light as electromagnetic wave. Dispersion, absorption, interference, difraction, polarization. Photon's theory of light. Law of emision and absorption, Planck's law of radiation. Lasers.

Recommended literature:
1. A. Hlavička et al., Fyzika pro pedagogické fakulty, SPN, 1971
2. R.P. Feynman et al., Feynmanove prednášky z Fyziky I,II,III, ALFA, 1985
3. D. Halliday et al.,Fyzika-Vysokoškolská učebnice obecné fyziky, VUTIUM, 2010
4. J. Fuka, B. Havelka, Optika a atómová fyzika, SPN,1961
5. A. Štrba, Všeobecná Fyzika 3 – Optika, ALFA, 1979

Course language:
slovak

Course assessment
Total number of assessed students: 123

A	B	C	D	E	FX
30.08	25.2	27.64	11.38	5.69	0.0

Provides: prof. RNDr. Rastislav Varga, DrSc.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/VF1d/12

Course name: General Physics IV

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 4 / 2 **Per study period:** 56 / 28
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚFV/VF1c/10 or ÚFV/VF1c/12

Conditions for course completion:
written tests
exam

Learning outcomes:
Basic knowledge about the atomic structure and spectra and nuclei, and elementary particles. Basic experimental methods in nuclear physics and passage of nuclear radiation through media.

Brief outline of the course:
Wave character of particles. De Broglie waves. Experimental evidence for de Broglie waves. Structure and models of atoms. Atomic spectra. Magnetic properties of atoms. X-ray spectra. Basic characteristics of the atomic nuclei. Nuclear forces and models. Radioactivity. Applications of radioactivity. Nuclear reactions. Elementary particles, basic properties and classification. Types of interactions. Resonances. Cosmic rays. Passage of particles through matter. Detectors. Accelerators.

Recommended literature:
1. Beiser A., Úvod do moderní fyziky, Praha, 1975.
2. Vanovič J.: Atómová fyzika, Bratislava, 1980.
3. Griffiths D. , Introduction to Elementary Particles, WILEY, 1987.
4. Úlehla I., Suk M., Trka Z.: Atómy, jádra, částice, Praha, 1990.
5. Síleš E., Martinská G.: Všeobecná fyzika IV, skriptá PF UPJŠ, 2. vydanie, Košice, 1992.
5. Hajko V. and team of authors, Physics in experiments, Bratislava, 1997.
6. Nosek D., Jádra a částice (Řešené příklady), Matfyzpress, MFF UK, Praha 2005,
7. Brandt S., The harvest of a century, Discoveries of modern physics in 100 episodes, Oxford, 2009.

Course language:
slovak and english

Course assessment
Total number of assessed students: 76

A	B	C	D	E	FX
40.79	26.32	14.47	9.21	9.21	0.0

Provides: prof. RNDr. Stanislav Vokál, DrSc., doc. RNDr. Janka Vrláková, PhD., doc. RNDr. Adela Kravčáková, PhD.
Date of last modification: 22.02.2018
Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ZFP1a/03	**Course name:** Physics Practical I

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:
The active work during semester and hand in all reports.
Vindication of reports.

Learning outcomes:
Developing proper laboratory habits, skills and verify their theoretical knowledge.

Brief outline of the course:
The goal of this laboratory exercises is to familiarize the students with measurement methods, with kinds and calculus of mistakes, with measured results processing, and with presentation of results. The students gain practical skills, and verify their theoretical knowledge of first semester introductory physics course. They develop proper laboratory habits.
Laboratory assignment:
1. Density measurements of liquids and solids.
2. Radius measurements of spherical cap. Measurements of surface using planimeter.
3. Gravitational acceleration measurements using mathematical and physical pendulum.
4. Moment of inertia measurement using physical and torsion pendulum.
5. Measurements of Young's modulus.
6. Measurement of coefficient of viscosity.
7. Measurement of the speed of sound.
8. Measurements of general gas constant and Boltzmann constant.
9. Measurements of thermal expansivity of air.
10. Measurements of thermal capacity of matter.
11. Measurement of the surface tension.

Recommended literature:
Degro, J., Ješková, Z., Onderová, Ľ., Kireš, M.: Základné fyzikálne praktikum I. (Basic physical measurements I), Ed. PF UPJŠ Košice 2007.
Standards STN ISO 31. Slovenský inštitút normalizácie v Bratislave (Slovak institute of technical standards in Bratislava),1997.

Ješková, Z.: Computer based experiments in thermodynamics using IP COACH,ed. PF UPJŠ in Košice, 2004.

Course language:
english

Course assessment
Total number of assessed students: 224

A	B	C	D	E	FX
58.04	25.0	12.05	4.02	0.89	0.0

Provides: doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzer, PhD., doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ZFP1b/03	**Course name:** Physics Practical II

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 credits: 3

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities: ÚFV/ZFP1a/03

Conditions for course completion:
Meausirnig of experimental tasks, their appreciation in the form of a written report, defending. Further evaluation is also a good theoretical preparation for the measurement of the task.

Learning outcomes:
The objectives of the laboratory are:
a. To gain some physical inside into some of the concepts presented in the lectures.
b. To gain some practice in data collection, analysis and interpretation of resumance.
c. To gain experience and report writing presentation and results.

Brief outline of the course:
Students on practical exercises are working in pairs experimental tasks in the field of electrical, electromagnetic and magnetic properties of matters.

Recommended literature:
Tumanski S, Handbook of magnetic measurements, CRC press, 2011.
Fiorillo F, Characterization and Measurement of Magnetic Materials, Elsevier, 2004.

Course language:
Slovak

Course assessment
Total number of assessed students: 190

A	B	C	D	E	FX
63.16	21.58	13.16	1.58	0.0	0.53

Provides: doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzer, PhD.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ZFP1c/14	**Course name:** Physics Practical III

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 credits: 3

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:
Measurements of experimental tasks, their evaluation in the form of a written report, which must be defended. As a part of evaluation there is is also a good theoretical preparation for the measurement of the task.

Learning outcomes:
To gain some physical inside into some of the concepts presented in the lectures. b. To gain some practice in data collection, analysis and interpretation of resumance. c. To gain experience and report writing presentation and results.

Brief outline of the course:
Oscilations. Pendulum. Composition and decomposition of oscillations. Resonance. The speed of sound. Refractive index. Lense's focal length. Interference. Diffraction. Diffraction and reflection of waves. Polarization. The speed of light. Quantum optics.

Recommended literature:
Degro,J., Ješková, Z., Onderová,Ľ., Kireš,M.: Základné fyzikálne praktikum I, PF UPJŠ Košice, 2006
P. Kollár a kol. Základné fyzikálne praktikum II, PF UPJŠ Košice, 2006
J. Brož Základy fysikálních měření, SPN Praha, 1981.

Course language:
slovak or english

Course assessment
Total number of assessed students: 42

A	B	C	D	E	FX
83.33	9.52	2.38	2.38	2.38	0.0

Provides: doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzer, PhD.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ZPU1/03	**Course name:** Essentials of UNIX Programming

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 credits: 4

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:
monitoring of student's programming skills
to create the program to solve the given task

Learning outcomes:
To provide students with basic programming skills necessary for solving problems which require applications of numeric methods, simulation techniques and computer data processing.

Brief outline of the course:
Essentials of work in Unix type OS. Basic characteristics, filesystems. Terminal. Basic input and output. Redirection of input and output. Command line, command interpreters and formats of basic commands. Process management. Remote terminal.
The C programming language: programming environment in UNIX. Compilers. C language syntax. Types of variables. Operators and expressions. Arithmetic operations. Control structures. Functions and program structure. Pointers and arrays. Structures. Standard library. Header files.
The C++ programming language. Object oriented programming. Data abstraction. Object. Class. Data encapsulation. Polymorphism. Constructor and destructor.
Component programming philosophy. Make, RCS, profilers, debuggers. Utilisation and creation of libraries. External libraries for numerical and distributed computing (LAPACK, MPI).

Recommended literature:
Stones, R., Matthew, N., Beginning Linux Programming, Computer Press, 2000
Kernighan, B. W., Ritchie, D. M., The C Programming Language, Prentice Hall, 1978
Stroustrup, B., The C++ Programming Language, Addison-Wesley, 1997

Course language:

Course assessment
Total number of assessed students: 127

A	B	C	D	E	FX
60.63	16.54	15.75	4.72	2.36	0.0

Provides: RNDr. Branislav Brutovský, CSc.

Date of last modification: 01.03.2018

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.

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: present

Number of 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:

Course assessment
Total number of assessed students: 33

abs	n
12.12	87.88

Provides: Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.

Date of last modification: 18.08.2017

Approved: Guaranteedoc. Mgr. Daniel Jancura, PhD.