

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ACH2/03		<b>Course name:</b> Inorganic Chemistry II			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 7					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/ACH1/03 or ÚCHV/ACH1/10 or ÚCHV/ACHU/03					
<b>Conditions for course completion:</b> Written examination at the end of the course. The final mark is given by the sum of points from seminars (max. 10 points) and 3x30 points from written test, totally 100 points. To pass it is required to obtain at least 51 points as well as 51 % of points from every partial examination.					
<b>Learning outcomes:</b> Goal of the course is to provide the students with a knowledge of systematic chemistry of metallic elements.					
<b>Brief outline of the course:</b> Electronic configuration, abundance, use, physical and chemical properties and reactivity of the elements of the 1st, 2nd groups, transition metal elements, elements of the 12th group, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Se, Te, Po, lanthanides and actinides. Binary and other compounds formed by these elements, their properties and reactivity. General properties, structure and bonding in metals, co-ordination and organometallic compounds.					
<b>Recommended literature:</b> 1. Greenwood, N. N., Earnshaw, A: Chemistry of the Elements. Pergamon Press, Oxford, 1984 2. Shriver, D.F., Atkins, P.W., Langford, C. H.: Inorganic Chemistry. 2ndEd., Oxford University Press, Oxford, 1995					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 602					
A	B	C	D	E	FX
11.63	19.1	30.4	26.58	7.81	4.49
<b>Provides:</b> prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ACHU/03		<b>Course name:</b> Inorganic Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCHU/10 or ÚCHV/VCHU/14 or ÚCHV/VCHU/15					
<b>Conditions for course completion:</b> Test in the middle and at the end of the semester. Oral examination.					
<b>Learning outcomes:</b> Aim of the course is to provide the students with a knowledge of systematic chemistry of non-metallic elements					
<b>Brief outline of the course:</b> Electronic configuration, abundance, use, physical and chemical properties, preparation, reactivity of non-metallic elements hydrogen, halogens, oxygen, sulphur, nitrogen, phosphorus, carbon, silicon, boron and rare gases. Binary and other compounds formed by these elements, their properties and reactivity. Metals and transition elements. Abundance, properties, reactivity, important compounds.					
<b>Recommended literature:</b> <a href="http://kosice.upjs.sk/~vladimir.zelenak/ACHU.htm">http://kosice.upjs.sk/~vladimir.zelenak/ACHU.htm</a> (ppt slides from the lectures as a support for self study) Greenwood, N. N., Earnshaw, A: Chemistry of the Elements. Pergamon Press, Oxford, 1984 Atkins O., Overton T., Rourke J., Weller M., Armstrong F.: Inorganic Chemistry, University Press, Oxford, 2006.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 661					
A	B	C	D	E	FX
10.44	20.12	30.41	25.57	10.14	3.33
<b>Provides:</b> prof. RNDr. Vladimír Zelenák, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚCHV/ ADP/03		<b>Course name:</b> Porous materials and their applications					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present							
<b>Number of credits:</b> 5							
<b>Recommended semester/trimester of the course:</b> 6.							
<b>Course level:</b> I., II., III.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Written test in the middle and the end of the semester.							
<b>Learning outcomes:</b> To make the acquaintance of various types of advanced porous solids and basic methods for their investigation. To get up the students with the methods used in characterisation of specific surface area and pore size of different types of porous materials.							
<b>Brief outline of the course:</b> Terminology and principal terms associated with powders, porous solids and adsorption. Methodology of adsorption at the gas-solid interface, liquid-solid interface. Assessment of surface area and porosity. Inorganic materials (active carbon, metal oxides, zeolites, clay minerals, new advanced materials) and phenomenon of adsorption. Application in the industry and everyday life.							
<b>Recommended literature:</b> 1. F. Rouquerol, J. Rouquerol, K. Sing: Adsorption by powders and porous solids, Academic press, London, UK, 1999 2. S. J. Gregg, K.S.W. Sing: Adsorption, surface area and porosity, Academic Press, London,, UK, 1982. 3. V. Zelenák: Adsorption and porosity of solid substances, internal study text, PF UPJŠ, 2007.							
<b>Course language:</b>							
<b>Course assessment</b> Total number of assessed students: 78							
A	B	C	D	E	FX	N	P
78.21	11.54	2.56	0.0	0.0	0.0	0.0	7.69
<b>Provides:</b> prof. RNDr. Vladimír Zelenák, PhD.							
<b>Date of last modification:</b> 26.02.2018							
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/ ALP/06		<b>Course name:</b> Alternative Education			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 180					
A	B	C	D	E	FX
66.11	30.56	0.56	1.11	0.56	1.11
<b>Provides:</b> Mgr. Katarína Petriková, PhD.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ ANCH1b/03		<b>Course name:</b> Instrumental Analytical Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Test					
<b>Learning outcomes:</b> Getting a knowledge of the theoretical principles and instrumentation in analytical chemistry.					
<b>Brief outline of the course:</b> Spectroscopic methods of analysis. Electromagnetic radiation. Basic components of spectroscopic instrumentation. Sources of energy. Detectors. Spectroscopy based on absorption. Transmittance and absorbance. Beer's Law. Limitations to Beer's Law. Ultraviolet-visible and infrared spectrophotometry. Atomic absorption spectroscopy. Spectroscopy based on emission. Molecular photoluminescence spectroscopy. Atomic emission spectroscopy. Spectroscopy based on scattering. Mass spectrometry. Electrochemical methods of analysis. Potentiometric methods of analysis. Reference electrodes. Membrane electrodes. Coulometric methods of analysis. Voltammetric methods of analysis. Chromatographic methods. General theory of column chromatography. Optimizing chromatographic separations. Gas chromatography. High-performance liquid chromatography. Ion-exchange chromatography. Supercritical fluid chromatography.					
<b>Recommended literature:</b> 1. Labuda a kol. Analytická chémia. ISBN: 9788022742429, Vydavateľstvo: STU Bratislava, Rok vydania: 2014, Počet strán: 671 2. Christian G.D. Analytical Chemistry. John Wiley & Sons, Inc. New York – Chichester – Brisbane – Toronto – Singapore 1994. 3. Holtzclaw H.F., Jr., Robinson W.R. College Chemistry with Qualitation Analysis. D.C. Heath and Company 1988.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 519					
A	B	C	D	E	FX
20.42	12.14	21.58	19.08	26.4	0.39

**Provides:** prof. Mgr. Vasil' Andruch, DrSc., RNDr. Rastislav Serbin, PhD., RNDr. Lívia Kocúrová, PhD., RNDr. Jana Šandrejová, PhD.

**Date of last modification:** 26.02.2018

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ ANCHU/03		<b>Course name:</b> Analytical Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/15 or ÚCHV/VCHU/10 or ÚCHV/VACH/10					
<b>Conditions for course completion:</b> 3x test of analytical calculations. Examination					
<b>Learning outcomes:</b> Survey of basic principles and tasks of analytical chemistry and applications of analytical methods in research and practice.					
<b>Brief outline of the course:</b> Subject and role of analytical chemistry. General principles and procedures - sampling, sample pre-treatment. Preparation of solutions. Evaluation of the results. Classification of analytical reactions. Qualitative analysis of cations and anions. Basic principles of organic analysis. Methods of quantitative analysis. General principles of gravimetry. Volumetric analysis. Instrumental methods of analytical chemistry (basic principles, instrumentation and applications) - electroanalytical, optical and separation methods.					
<b>Recommended literature:</b> Skoog D.A.: Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985. D.Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 634					
A	B	C	D	E	FX
18.61	18.77	25.08	24.29	9.31	3.94
<b>Provides:</b> doc. RNDr. Tat'ána Gondová, CSc.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ASM/03		<b>Course name:</b> Separation Methods			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> (ÚCHV/ANCHU/03 or ÚCHV/ANCHE/09 or ÚCHV/ANCH1b/03) and (ÚCHV/PAEC/03 or ÚCHV/PANCH/06 or ÚCHV/PANCHE/09 or ÚCHV/PACU/03)					
<b>Conditions for course completion:</b> Examination					
<b>Learning outcomes:</b> Survey of basic principles, theoretical background and applications of separation methods in research and analytical practice.					
<b>Brief outline of the course:</b> Basic principles, classification, theory and applications of separation methods. Extraction - LLE, SPE, SPME. Chromatographic methods - theory, classification. Gas chromatography, retention mechanisms, stationary phases and their selection. Instrumentation, detectors in GC. Data evaluation - qualitative and quantitative analysis. High-performance liquid chromatography, principles, classification. Stationary and mobile phases in LC, instrumentation. Applications. Comparison of GC and HPLC methods. Planar chromatographic methods - TLC, HPTLC, PC. Electrophoretic techniques - CE, ITP, HPCE. MEKC - micellar electrokinetic capillary chromatography. Lab-on-a-Chip (LOC), TAS, electrophoresis on a chip, principles and applications.					
<b>Recommended literature:</b> Krupčík, J.: Separačné metódy, SVŠT CHTF, Bratislava 1983. Skoog D. A., Leary J. J.: Principles of instrumental analysis. Saunders College Publishing, New York 1997. Pawliszyn J., Lord H. L.: Handbook of sample preparation, Wiley 2010. Churáček J., Jandera P.: Úvod do vysokoúčinné kapalinové chromatografie, SNTL, Praha 1984.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 439					
A	B	C	D	E	FX
27.11	25.06	26.2	12.98	6.15	2.51



<b>Provides:</b> doc. RNDr. Tat'ána Gondová, CSc.
<b>Date of last modification:</b> 26.02.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ BAC1/04		<b>Course name:</b> Bioinorganic Chemistry I			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Test or seminar works examination					
<b>Learning outcomes:</b> 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.					
<b>Brief outline of the course:</b> Metallic and non-metallic 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.					
<b>Recommended literature:</b> 1. Shriver D. F., Atkins P. W., Overton T. L., Rourke J.P., Weller M.T., Armstrong F.A.: Shriver & 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.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 243					
A	B	C	D	E	FX
41.98	27.98	18.11	4.53	7.0	0.41
<b>Provides:</b> doc. RNDr. Zuzana Vargová, Ph.D.					
<b>Date of last modification:</b> 26.02.2018					

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák,  
PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ BACHZ/06		<b>Course name:</b> Fundamentals of Bioanalytical Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> written test Oral examination					
<b>Learning outcomes:</b> Principles and theoretical foundations the application of analytical methods in bioanalysis.					
<b>Brief outline of the course:</b> Introduction to Bioanalytical Chemistry. Biological samples classification. Factors that affect analytes in biological samples. Collection, transport and storage of samples, the main principles of sampling, the suppressing of undesirable phenomena. Selected methods of pretreatment of biological samples. Analyzers, equipment and organization of work in a clinical laboratory. Control and management of quality in clinical laboratory. Quality manual, calibration, control, and reference materials. Validation and Good Laboratory Practice. Buffers in bioanalysis. Enzymes in bioanalysis, introduction, distribution, Mechanism of enzyme catalysis. The kinetics of enzymatic reactions with one substrate, the Michaelis constant, constant specificity, lag phase, kinetics of reactions with two substrates. Moderators of enzyme activity. Selected methods for analysis of biomolecules.					
<b>Recommended literature:</b> 1.Mikkelsen S.R, Cortón E.: Bioanalytical Chemistry, Wiley, 2004 2.Wilson I., Bioanalytical Separations 4, (Handbook of Analytical Separations), Elsevier, 2003 3.Lee, D.C., Webb, M. Pharmaceutical Analysis, Blackwell, 2003					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 75					
A	B	C	D	E	FX
30.67	33.33	30.67	4.0	0.0	1.33
<b>Provides:</b> doc. RNDr. Katarína Reiffová, PhD.					
<b>Date of last modification:</b> 26.02.2018					

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák,  
PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/BCHU/03		<b>Course name:</b> Biochemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCHU/10 or ÚCHV/VCHU/15 or ÚCHV/VACH/10 or ÚCHV/VCHU/14					
<b>Conditions for course completion:</b> test + oral examination					
<b>Learning outcomes:</b> The aim of biochemistry teaching is to acquire knowledge in the field of living organisms on the basis of their molecular structure and metabolism.					
<b>Brief outline of the course:</b> 1. Protein Structure and Function, Exploring proteins 2. DNA and RNA and the Flow of Genetic Information, Exploring genes 3. Enzymes: Basic Concepts and Kinetics, Catalytic Strategies and Regulatory Strategies 4. Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides – Functions and Properties) 5. Lipids and Cells Membranes, Membrane Channels and Pumps 6. Metabolis: Basic Concepts and Design, Signal-Transduction Pathways 7. Glycolysis and Gluconeogenesis, Glycogen Metabolism 8. The Citric Acid Cycle and Glyoxylate Cycle 9. Oxidative Phosphorylation, The Light Reactions of Photosynthesis 10. The Calvin Cycle and the Pentose Phosphate Pathway 11. Fatty Acids Metabolism, Urea Cycle 12. DNA Replication, Transcription (RNA Synthesis) 13. Protein Synthesis & Degradation, the Integration of Metabolism					
<b>Recommended literature:</b> Škárka: Biochémia. Alfa, 1992 Voet a Voetová: Biochemie. Victoria Publishing, Praha, 1994 Stryer, L.: Biochemistry, W.H. Freeman and Company, New York, 1988					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 1105					
A	B	C	D	E	FX
18.01	17.47	20.81	21.54	19.28	2.9

<b>Provides:</b> doc. RNDr. Erik Sedlák, PhD., RNDr. Nataša Tomášková, PhD.
<b>Date of last modification:</b> 26.02.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ BDD/05		<b>Course name:</b> Biology of Children and Adolescents			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 0 <b>Per study period:</b> 28 / 0 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4., 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Written test					
<b>Learning outcomes:</b> The aim of the subject is to gain the particular level of knowledge about human body and its development. It is necessary for the understanding of specific biological characteristics of children and adolescents linked to development.					
<b>Brief outline of the course:</b> Human ontogenesis. Postnatal development. Age specific features of skeletal and muscular, circulatory, respiratory, gastrointestinal and urinary systems. Reproductive system. Endocrine system. Nervous system. Age specifics of selected diseases and drug dependence arise. Human population and environment.					
<b>Recommended literature:</b> Drobný I., Drobná M.: Biológia dieťaťa pre špeciálnych pedagógov I. a II. Bratislava, PdF UK, 2000 Lipková V.: Somatický a fyziologický vývoj dieťaťa. Osveta Bratislava, 1980 Malá H., Klementa J.: Biológia detí a dorastu. Bratislava, SPN, 1989					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 1402					
A	B	C	D	E	FX
30.53	22.97	17.9	18.12	9.91	0.57
<b>Provides:</b> doc. RNDr. Monika Kassayová, CSc.					
<b>Date of last modification:</b> 21.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚFV/ BKP/14	<b>Course name:</b> Bachelor Project
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 5.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Submission of the bachelor project based on the assignments of the supervisor and acceptance of its content by the supervisor.	
<b>Learning outcomes:</b> Bachelor project prepared as a design of a bachelor thesis, as an evidence that student is able to process knowledge available in different resources, cite correctly and keep the layout correctly, prepare a presentation and share the results in front of experts.	
<b>Brief outline of the course:</b> The bachelor project is aimed at the selected problem of physics. Based on the assignments student carries out the following activities: development of the project, formulation of the problem and methods, formal and graphical layout, correct citations and references, basic principles of presentation and its defence.	
<b>Recommended literature:</b> 1. Resources (literature, papers) based on the project assignments. 2. Regulations No. 1/2011 about final works (thesis for University of P.J. Safarik.	
<b>Course language:</b> Slovak, English	
<b>Course assessment</b> Total number of assessed students: 5	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 01.03.2018	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚCHV/ BKP/14	<b>Course name:</b> Bachelor Project
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 5.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Submission of the bachelor project, the defense of the project and acceptance of its content by the supervisor.	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b> 1. Scientific papers related to the topic of the bachelor project. 2. Directive No. 1/2011 of the rector UPJS in Košice.	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 40	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 26.02.2018	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ BPO/14		<b>Course name:</b> Bachelor Thesis and its Defence			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Oral presentation of the thesis results. Answering questions of the thesis oponent or members of the state examination board.					
<b>Recommended literature:</b>					
<b>Course language:</b> slovak					
<b>Course assessment</b> Total number of assessed students: 154					
A	B	C	D	E	FX
87.01	9.09	1.95	1.95	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ BPO/14		<b>Course name:</b> Bachelor Thesis and its Defence			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Required number of credits gained basedon submitting the bachelor thesis.					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Presentation of the bachelor thesis results, answering questions of the reviewer and members of professional commission.					
<b>Recommended literature:</b>					
<b>Course language:</b> Slovak or English					
<b>Course assessment</b> Total number of assessed students: 28					
A	B	C	D	E	FX
92.86	3.57	3.57	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ BSSM/15		<b>Course name:</b> Bachelor State Exam Physics			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 1					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Answering questions concerning selected fields of the subjects of Bachelor state exam.					
<b>Learning outcomes:</b> Basic knowledge and overview of knowledge in the fields stated by the Bachelor state exam.					
<b>Brief outline of the course:</b> Exam in the field of knowledge in physics consisting of an overview of the following fields: <ul style="list-style-type: none"> <li>- Mechanics and molecular physics</li> <li>- Electricity and magnetism</li> <li>- Oscillations and waves, optics</li> <li>- Nuclear physics</li> <li>- General biophysics</li> <li>- Theoretical mechanics</li> <li>- Theory of electromagnetic field</li> <li>- Statistical physics</li> </ul>					
<b>Recommended literature:</b>					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 12					
A	B	C	D	E	FX
33.33	41.67	16.67	0.0	8.33	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ CHV1/99		<b>Course name:</b> Chemical calculations			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Short written tests. Written test.					
<b>Learning outcomes:</b> To teach students how to calculate material balances in the systems with or without chemical processes and how to calculate examples concerning the chemical equilibrium.					
<b>Brief outline of the course:</b> Expression of the clear matter amount and the system composition. Stoichiometric formula. Material balances for preparation, dissolving and mixing of solutions, and for separating of mixtures. Material balances for combined processes. Chemical equations and material balances in the systems with chemical processes. Acid-Base equilibrium and the pH calculations. The solubility product and solubility.					
<b>Recommended literature:</b> Potočník I.: Chemické výpočty vo všeobecnej a anorganickej chémii (skriptum), PF UPJŠ, Košice, 2006.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 1240					
A	B	C	D	E	FX
20.56	19.68	24.44	20.56	13.95	0.81
<b>Provides:</b> RNDr. Martin Vavra, PhD., RNDr. Miroslav Almáši, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KFaDF/DF2p/03		<b>Course name:</b> History of Philosophy 2 (General Introduction)			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 738					
A	B	C	D	E	FX
60.84	13.82	12.6	8.67	3.39	0.68
<b>Provides:</b> doc. PhDr. Pavol Tholt, PhD., mim. prof., Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.					
<b>Date of last modification:</b> 31.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ DGS/15	<b>Course name:</b> Students' Digital Literacy
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> continuous assessment and final project	
<b>Learning outcomes:</b> To acquire an overview of the current possibilities of digital technology to develop skills and competencies with emphasis on the area of communication, social interaction and personal. To acquire basic digital skills for working with advanced technologies (mobile phone, tablet, laptop, social media, online webtechnologies). To understand the value of existing advanced technologies for better and more effective learning, work and active life in higher education, lifelong learning and further career prospects.	
<b>Brief outline of the course:</b> Introduction to the problems of current, commonly available digital technology. Tools for access to online information source (mobile applications for access to information systems, databases, data books). Tools for collecting, generating direct information and data and its subsequent analysis and visualization. Tools for providing and sharing of electronic content (cloud technology - Google Drive, Youtube, Google+, Skydrive, Dropbox). Tools for communication, discussion and collaborative activities. Legal work with digital technologies and resources, plagiarism, critical evaluation of digital resources. Security, privacy, digital ethics and etiquette, digital citizenship.	
<b>Recommended literature:</b> 1. Bruff, D. (2009). Teaching with classroom response systems: Creating active learning environments. San Francisco: Jossey-Bass. 2. Byrne, R. (2012). Google Drive and Docs for Teachers. Free Tech for Teachers. 3. Kawasaki, G. (2012). What the Plus! Google+ for the Rest of Us. Amazon igital Services. 4. Kolb, L. (2011). Cell Phones in the Classroom: A Practical Guide for Educators. International Society for Technology in Education.	
<b>Course language:</b> Slovak	
<b>Course assessment</b> Total number of assessed students: 147	



abs	n
96.6	3.4
<b>Provides:</b> doc. RNDr. Stanislav Lukáč, PhD., doc. RNDr. Jozef Hanč, PhD., doc. RNDr. Ľubomír Šnajder, PhD.	
<b>Date of last modification:</b> 23.08.2017	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/EDS/15	<b>Course name:</b> Educational software
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 0 / 2 <b>Per study period:</b> 0 / 28 <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 5.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1 Preparation of interim assignments: a) Worksheet for student (with custom graphics) b) Multimedia educational presentation (with pictures, animations and sounds) c) Interactive educational quiz (with several types of quiz items) d) Methodological guidance on the use of interactive applications in teaching selected topic of chosen school subject. 2 Creation and presentation of final project on the use of educational software in education.	
<b>Learning outcomes:</b> 1. To acquire an overview of the educational software types and its exploitation in education. 2. To gain or enhance basic skills in working with: a) presentation software, programs for creation and editing images, animations, diagrams, sounds, concept maps, b) programs for creation of quizzes, questionnaires, voting, c) simulation and modeling software, d) selected subject-oriented educational programs, 3. To create and present a final project on the use of educational software in education.	
<b>Brief outline of the course:</b> Educational software types. Onlilne educational sources and tools. Multimedia processing. Tools for creation of teaching aids.	
<b>Recommended literature:</b> 1. Digitálna gramotnosť učiteľa : učebný materiál- modul 1 / Rastislav Adámek ... [et al.]. - Košice : Ústav informácií a prognóz školstva, 2009. - 80 s. - ISBN 9788080861193(brož.). 2. Moderná didaktická technika v práci učiteľa : učebný materiál modul 2 / Rastislav Adámek ... [et al.] ; recenzenti Viliam Fedák, Anton Lavrin. - Košice : Elfa, 2010. - 200 s. - ISBN 9788080861353 (brož.). 3. Web, Multimédia / Martin Homola ... [et al.]. - Bratislava : Štátny pedagogický ústav, 2010. - 68 s. - Č. projektu: ŠPVV ĎVUi 26120130001. - ISBN 9788081180514 (brož.).	
<b>Course language:</b>	
<b>Notes:</b>	

Content of lessons will be flexibly adapted to the field of study of learners. Language learners will be able to work more with pictures and sounds, physicists with simulation programs, mathematicians with mathematical software, etc.

**Course assessment**

Total number of assessed students: 30

A	B	C	D	E	FX
63.33	20.0	13.33	0.0	3.33	0.0

**Provides:** doc. RNDr. Ľubomír Šnajder, PhD.

**Date of last modification:** 23.08.2017

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ELEM1/15		<b>Course name:</b> Electronics			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VF1b/03 or ÚFV/VFM1b/15					
<b>Conditions for course completion:</b> Exam					
<b>Learning outcomes:</b> To explain physical principles of classical electronic components and systems and technologies of their realization. To perform analysis of properties and functions of basic electronic elements, electronic circuits and information transmission and processing systems. To introduce student into basic elements and devices in area of nanoelectronics and to explain methods of their fabrication and principles of their functioning.					
<b>Brief outline of the course:</b> Structure, properties and physical principles of the activity of selected electronic elements. Analysis of functions and properties of basic analog and digital electronic circuits. Nanoelectronics and selected building components of nanoelectronics: graphene, carbon nanotubes, selected types of nanodevices their properties, fabrication and integration to functional systems.					
<b>Recommended literature:</b> 1. Brown P.B., Frantz G.N., Moraff H.: Electronics for the Modern Scientist. Elsevier, 1982. 2. Delaney C.F.G.: Electronics for the Physicist with Applications. John Willey & Sons, 1980. 3. Wolt E. L.: Quantum Nanoelectronics, An introduction to electronic nanotechnology and quantum computing, Wiley-VCh, 2009					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 152					
A	B	C	D	E	FX
25.0	25.0	28.95	9.21	4.61	7.24
<b>Provides:</b> Mgr. Vladimír Komanický, Ph.D., prof. RNDr. Peter Kollár, DrSc.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ELP1/01		<b>Course name:</b> Electronics Practical			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/ELE1/07 or ÚFV/ELEM1/15					
<b>Conditions for course completion:</b> Debate with students during practice, trial preparation and processing of theoretical and experimental results of their defense. Summary evaluation of student activities while working on set topics of study practices.					
<b>Learning outcomes:</b> Practical work of students in the design, construction and properties of the measurements of electronic circuits and interpretation of the results obtained to verify and consolidate the theoretical knowledge acquired in lectures on the subject Electronics.					
<b>Brief outline of the course:</b> 1. Combinatorial logical circuits. 2. Logical memory circuits. 3. Logical sequence circuits. 4. Rectifiers, filters, stabilizers. 5. Amplifier with bipolar transistor. 6. Stabilized DC power supplies. 7. Generators of harmonic signals. 8. Operational amplifiers and operational network interfaces. 9. Digital-to-analog converters. 10. Analog-to-digital converters. 11 Reserve.					
<b>Recommended literature:</b> 1. Delaney C.F.G.: Electronics for the Physicist with Applications. John Willey & Sons, New York, 1980. 2. Zbar P.B., Malvino A.P., Miller M.A.: Basic Electronics: a Text-Lab Manual. Macmillan/McGraw – Hill, New York, 1994.					
<b>Course language:</b> slovak or english					
<b>Course assessment</b> Total number of assessed students: 35					
A	B	C	D	E	FX
97.14	0.0	2.86	0.0	0.0	0.0
<b>Provides:</b> RNDr. Vladimír Tkáč, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚCHV/ FCH1b/10	<b>Course name:</b> Physical Chemistry II
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present	
<b>Number of credits:</b> 6	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I.	
<b>Prerequisites:</b> ÚCHV/FCH1a/03 or ÚCHV/FCHU/10	
<b>Conditions for course completion:</b> Two partial tests from computational seminars in 6th and 12th week of semester. Examination.	
<b>Learning outcomes:</b> Understandable explain to students the principles of chemical kinetics of processes, to elucidate the kinetics and mechanism of some reactions. To analyse particularly the equilibrium and kinetics of electrode processes.	
<b>Brief outline of the course:</b> Electrochemistry. Equilibrium homogeneous processesn electrolyte solutions. Charge transfer in electrolyte solutions. Nonequilibrium homogeneous processes. Trnasport processes in electrolyte solutions. Conductance and molar conductivity. Hindering effects. Transport numbers. Equilibrium in heterogeneous electrochemical systems. Pocesses on charged interfaces. Electrochemical cells and fuel cells. Classification of electrode types. Concentration cells. Electrolysis. Electrochemical power sources. Potentiometry. Electrical double layer. Surface tension. Chemical kinetics. Homogeneous processes. Reaction rate. Reaction order. Classification of chemical reactions. Elementary chemical reactions. Mechanism and kinetics equations of complicated chemical processes. Methods of rate low determination. Theory of chemical kinetics. Ttemperature dependence of reaction rates. Collision theory. Activated complex theory. Chain reactions. Structure and rate lows of chain reactions. Explosion. Polymerisation reactions. Photochemical reactions. Catalysis. Theory of homogeneous catalysis. Chemical oscillation reactions. Heterogeneous processes. Difusion. Physical and chemical adsorption. Adsorption and diffusion. Processes in heterogeneous electrochemical systems. Electrode kinetics, activation and diffusive mechanism of charge transfer. Application of theoretical relationships on the solving of concrete problems and on the calculation of examples during seminars.	
<b>Recommended literature:</b> T. Engel, P. Reid : Physical Chemistry, Pearson Educat. Inc., San Francisco 2006 P.W. Atkins : Physical Chemistry,Oxford University Presss, Oxford 1986, 1990, 1994, 1998 W.J. Moore : Physical Chemistry,Longman, London 1972 and newer editions	
<b>Course language:</b>	

**Course assessment**

Total number of assessed students: 530

A	B	C	D	E	FX
15.66	18.68	22.26	18.87	20.57	3.96

**Provides:** prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Jana Hovancová, RNDr. Ondrej Petruš, PhD., Mgr. Radka Gorejová, Mgr. Dominika Capková

**Date of last modification:** 26.02.2018

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ FCHU/10		<b>Course name:</b> Physical Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10 or ÚCHV/VCHU/15					
<b>Conditions for course completion:</b> Two partial tests from computational seminars. Examination.					
<b>Learning outcomes:</b> To provide the students with basic knowledge of physical chemistry.					
<b>Brief outline of the course:</b> Fundamental concepts of thermodynamics, thermochemistry, chemical equilibrium, phase equilibria and diagrams, laws for ideal gas and real gases, liquids, solutions, solutions of electrolytes. Electrochemistry: ionics and electrode processes. Electrodes and electrochemical cells, corrosion. Chemical kinetics, catalysis. Adsorption.					
<b>Recommended literature:</b> T. Engel, P. Reid: Physical Chemistry, Pearson Education, Inc., San Francisco 2006 P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford 1986, 1990, 1996 W.J. Moore: Physical Chemistry, Longman, London 1972 and newer editions					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 256					
A	B	C	D	E	FX
31.64	19.53	14.45	17.19	13.28	3.91
<b>Provides:</b> prof. RNDr. Renáta Oriňáková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Ján Macko, PhD., RNDr. Ivana Šišoláková, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guarantee prof. RNDr. Peter Kollár, DrSc. Guarantee prof. RNDr. Vladimír Zelenák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ FDE/15		<b>Course name:</b> Physics in Demonstration Experiments			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Seminar work – a project dealing with hands-on experiments and their role in Physics teaching.					
<b>Learning outcomes:</b> The goal of the course is to get better the understanding of basic physical concepts and phenomena through demonstrational physical experiments.					
<b>Brief outline of the course:</b> The course is aimed at the conceptual understanding of basic physical concepts and phenomena with the help of selected demonstrational experiments. The experiments concern the content of the subject Introductory physics and their realization is based on students' active participation.					
<b>Recommended literature:</b> 1. D.Halliday, R.Resnick, J.Walker: Fyzika, VUTIUM, Brno, 2000 2.K.Cummings, P.W.Law, E.F.Redish, P.J.Cooney: Understanding Physics, John Wiley & Sons, Inc., 2004 3.P.G.Hewitt: Conceptual Physics, tenth edition, Pearson, Addison Wesley, 2006 4.L.Onderová, M.Kireš, Z.Ješková, J.Degro: Praktikum školských pokusov II, PF UPJŠ, 2004					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 16					
A	B	C	D	E	FX
81.25	6.25	6.25	6.25	0.0	0.0
<b>Provides:</b> doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., PaedDr. Iveta Štefančinová, Ph.D.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/ INP/17		<b>Course name:</b> Inclusive Pedagogy			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 0					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 05.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ISC1a/00		<b>Course name:</b> Cheminformatics I			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> seminar project					
<b>Learning outcomes:</b> Introductory course aimed at introducing students to the fundamental informatics techniques for chemistry-related disciplines. The class will cover a wide range of topics, including searching chemical information on internet, searching for patent information and work with the primary and secondary literature.					
<b>Brief outline of the course:</b> Searching, retrieving and use of the informations in chemistry. Using of "paper" resources (primary journals, Chemical Abstracts, Beilstein). Searching chemical information on Internet (Scirus, ScienceDirect, Scopus, Web of Science, Medline, NIST) and e-journals.					
<b>Recommended literature:</b> 1. R.E. Maizell: How to find Chemical Information, John Wiley, New York 1998 2. Internet resources for chemistry.					
<b>Course language:</b> slovak language and english language					
<b>Course assessment</b> Total number of assessed students: 787					
A	B	C	D	E	FX
68.49	8.64	13.21	7.24	1.65	0.76
<b>Provides:</b> RNDr. Monika Tvrdoňová, PhD., RNDr. Ladislav Janovec, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ KCHU/03		<b>Course name:</b> Coordination Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/ACHU/03					
<b>Conditions for course completion:</b> Final written exam					
<b>Learning outcomes:</b> The student acquires basic knowledge on the coordination compounds, preparation, isomerism and properties of coordination compounds as well as about the chemical bonding in coordination compounds.					
<b>Brief outline of the course:</b> Definition and nomenclature of coordination compounds. Central atom and ligands, coordination numbers. Isomerism, preparation and stability of coordination compounds, chemical bonding in coordination compounds.					
<b>Recommended literature:</b> J. Ribas: Coordination Chemistry, Wiley-VCH, Weinheim, 2008. J. C. Huheey, E. A. Keiter, R. L. Keiter: Inorganic Chemistry, Haper Collins, New York, 1993. G. A. Lawrance: Introduction to Coordination Chemistry, Wiley, 2010.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 63					
A	B	C	D	E	FX
55.56	22.22	15.87	3.17	3.17	0.0
<b>Provides:</b> prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ KP/12	<b>Course name:</b> Survival Course
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance Final assessment: continuous fulfilment of all tasks within the course	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 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.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 365	
abs	n
44.38	55.62

<b>Provides:</b> MUDr. Peter Dombrovský, Mgr. Marek Valanský
<b>Date of last modification:</b> 18.08.2017
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ KVM/15		<b>Course name:</b> Quantum Mechanics I.			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> To become familiar with elementary principles of quantum mechanics and to illustrate its possible applications on selected examples.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> 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.					
<b>Course language:</b> EN - english					
<b>Course assessment</b> Total number of assessed students: 14					
A	B	C	D	E	FX
28.57	7.14	28.57	21.43	0.0	14.29
<b>Provides:</b> doc. RNDr. Jozef Strečka, PhD.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ LKSp/13	<b>Course name:</b> Summer Course-Rafting of TISA River
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance Final assessment: Raft control on the waterway (attended/not attended)	
<b>Learning outcomes:</b> Learning outcomes: Students have knowledge of rafts (canoe) and their control on waterway.	
<b>Brief outline of the course:</b> 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	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 142	
abs	n
41.55	58.45



<b>Provides:</b> Mgr. Peter Bakalár, PhD.
<b>Date of last modification:</b> 18.08.2017
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/MFYU/15		<b>Course name:</b> Methods of Physical Problems Solving			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Successfull in two writing exams oriented on problem solving.					
<b>Learning outcomes:</b> Student is able to use the selected method of problem solving. He(she) is experienced in solving problems from physics olympiad with comments. Student knows how to use multimedia support and modelling for problem solving.					
<b>Brief outline of the course:</b> 1. Clasification of selected physics problem solving methods 2. Mechanics 3. Multimedia support for problem solving 4. Hydromechanics 5. Physics problems series 6. Thermodynamics 7. Physics olympiad 8. Physics olympiad problem solving with comments 9. Electric current 10. Qualitative physics problems 11. Mechanical oscillations 12. Dynamics modeling and problem solving					
<b>Recommended literature:</b> Halliday, D., Resnick, R., Walker, J.: Fyzika 1-5, Akademické nakladatelství, VUTIUM, ISBN: 8021418680, 2007					
<b>Course language:</b> Slovak, English					
<b>Course assessment</b> Total number of assessed students: 7					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

<b>Provides:</b> doc. RNDr. Marián Kireš, PhD.
<b>Date of last modification:</b> 01.03.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ MIN1/14		<b>Course name:</b> Basis of Mineralogy			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCH/03 or ÚCHV/VCH/10 or ÚCHV/VCHU/10 or ÚCHV/ZAC2/10 or ÚCHV/VACH/10 or ÚCHV/CHG/09 or ÚCHV/ZCF/03					
<b>Conditions for course completion:</b> Verification of theoretical knowledge and recognizing minerals. Semester project, practical test from recognizing of minerals, optional oral examination.					
<b>Learning outcomes:</b> To recognize the beauty of nature and to obtain basic knowledge from mineralogy. To familiarize students with properties of usual minerals and to recognize these minerals.					
<b>Brief outline of the course:</b> Basic terms and definitions, origin of minerals in nature. Basis of morphological and structural crystallography: characteristic properties of crystals, crystallographic laws, crystal structure, unit cells and their parameters, crystallographic systems with examples of minerals. Crystallochemistry: types of bonds and structures and their effect on the properties of minerals. Physical properties of minerals and their utilize in minerals classification. Basis of genetic and systematic mineralogy. Structure of silicates.					
<b>Recommended literature:</b> M. Košuth: Mineralógia. Elfa, s.r.o. Košice, 2001 V. Radzo: Mineralógia, Alfa Bratislava, 1987.					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 63					
A	B	C	D	E	FX
84.13	11.11	1.59	1.59	0.0	1.59
<b>Provides:</b> doc. RNDr. Ivan Potočný, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/MMKV/17		<b>Course name:</b> Multiculturalism and Multicultural Education			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 48					
A	B	C	D	E	FX
31.25	27.08	37.5	2.08	2.08	0.0
<b>Provides:</b> PaedDr. Janka Ferencová, PhD.					
<b>Date of last modification:</b> 05.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚFV/ MTFM/15	<b>Course name:</b> Modern Trends in Physics
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present	
<b>Number of credits:</b> 3	
<b>Recommended semester/trimester of the course:</b> 4.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> test test	
<b>Learning outcomes:</b> Presentation of scientific goals and experimental facilities on the Institute of Physics. Discussion of new trends in physics of micro-world, astrophysics, biophysics and physics of condensed matter.	
<b>Brief outline of the course:</b> The present state of the micro-world physics – fundamental particles and the interaction forces. Theoretical description of the micro-world – the Standard Model. Experimental tests of the Standard Model - the discovery of neutral currents and intermediate $W^{+-}$ , $Z^0$ bosons. Heavy ion collisions and the search for new state of matter - quark gluon plasma - on the most powerful accelerators RHIC (Relativistic Heavy Ion Collider), Brookhaven National Laboratory) , USA and on the constructed LHC (Large Hadron Collider), CERN, Geneva. Big Bang and the quark gluon plasma. Some open questions – search for Higgs boson, responsible for the mass of fundamental particles and quark gluon plasma in laboratory conditions. Practical activities – demonstration of the knowledge from lectures at identification of the real $Z^0$ decay events in experimental data from the LEP accelerator, CERN, Switzerland. New trends in astrophysical investigation: Solar system planets and exoplanets; cataclysmic variables, blazars and polars; black holes; quasars and active galactic nuclei, clusters of galaxies and web structure of Universe; gravitational lensing, dark matter and dark energy; gamma ray bursts. Topical problems in biophysics Low temperatures as a tool for the study of physical properties of matter. Non-Fermi liquid materials... Geometrically frustrated systems. Quantum tunneling in molecular magnets. Application of quantum magnets. Excursion in the Centre of Excellence of Low Temperature Physics. Soft magnetic nanostructure materials prepared by milling and alloying; magnetic properties of small particles, magnetization processes, domain structure, milling and alloying.	
<b>Recommended literature:</b> S. Chikazumi: Physics of Magnetism, J. Willey and Sons, Inc. New York, London, Sydney, 1997. C. Suryanarayana, Progress in Materials Science 46 (2001), 1-184	

F. Close : The Cosmic Onion, 1990 Cindy Schwarz :A Tour of the Subatomic Zoo, 1997 Frank Close, Michael Marten, Christine Sutton : The Particle Odyssey- A Journey to the Heart of Matter, 2002 <a href="http://vk.upjs.sk/~epog/2006/">http://vk.upjs.sk/~epog/2006/</a> Scientific journals	
<b>Course language:</b> english	
<b>Course assessment</b> Total number of assessed students: 10	
abs	n
100.0	0.0
<b>Provides:</b> Dr.h.c. prof. RNDr. Alexander Feher, DrSc.	
<b>Date of last modification:</b> 01.03.2018	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ MTFa/15		<b>Course name:</b> Mathematics I for physicists			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Two written tests and one homework with exercises 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.					
<b>Learning outcomes:</b> To obtain basic knowledge on functions of one variable and their properties; to be able to apply the theory in concrete exercises.					
<b>Brief outline of the course:</b> Functions, basic properties. Elementary functions. Continuous functions. Limits. Derivation and its geometric applications. Theorems about continuous functions. Behaviour of functions. Indefinite integrals, basic methods of integration. Definite integral and its applications.					
<b>Recommended literature:</b> S. Lang: A First Course in Calculus, Springer Verlag, 1998					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 312					
A	B	C	D	E	FX
8.33	8.33	14.1	19.55	29.49	20.19
<b>Provides:</b> doc. RNDr. Roman Soták, PhD., RNDr. Erika Vojtková					
<b>Date of last modification:</b> 27.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ MTFb/15		<b>Course name:</b> Mathematics II for physicists			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚMV/MTFa/15					
<b>Conditions for course completion:</b> 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.					
<b>Learning outcomes:</b> 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.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> 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.					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 178					
A	B	C	D	E	FX
11.24	16.29	12.36	25.84	29.21	5.06
<b>Provides:</b> doc. RNDr. Stanislav Lukáč, PhD., RNDr. Anton Hovana					
<b>Date of last modification:</b> 27.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/MUSU/15		<b>Course name:</b> Structure determination - spectroscopic methods			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 3 <b>Per study period:</b> 28 / 42 <b>Course method:</b> present					
<b>Number of credits:</b> 7					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/ACHU/03 and ÚCHV/ANCHU/03 and ÚCHV/OCHU/03					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Fundamentals of molecular spectroscopy and magnetic properties study, as powerful tools for structure determination in chemistry. Those are ultraviolet, visible, infrared and Raman spectroscopy, mass spectrometry and methods based on magnetic resonance ( <sup>1</sup> H NMR, <sup>13</sup> C NMR).					
<b>Recommended literature:</b> L.G.Wade,Jr.: Organic Chemistry. Prentice Hall International, Inc. Englewood Cliffs, New Yersey 1995.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 96					
A	B	C	D	E	FX
10.42	34.38	33.33	18.75	3.13	0.0
<b>Provides:</b> doc. RNDr. Ján Imrich, CSc., RNDr. Monika Tvrdoňová, PhD., doc. RNDr. Juraj Kuchár, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KGER/ NJKG/07		<b>Course name:</b> Communicative Grammar in German Language			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 48					
A	B	C	D	E	FX
54.17	12.5	10.42	4.17	10.42	8.33
<b>Provides:</b> PaedDr. Ingrid Puchalová, PhD., Mgr. Barbora Molokáčová					
<b>Date of last modification:</b> 25.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚCHV/ OCH1b/03	<b>Course name:</b> Organic chemistry II
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present	
<b>Number of credits:</b> 7	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Two tests at lecture in 7 and 14th week. Test max 50 points. At least 25 points required. Written exam, 100 points. At least 49% of points required. Final evaluation: A 90-100 pts, B 80-89 pts, C 70-79 pts, D 60-69 pts, E 50-59 pts, FX 0-49 pts	
<b>Learning outcomes:</b> Second part of two-semester organic chemistry course.	
<b>Brief outline of the course:</b> Reaction Mechanisms, Mechanisms of Organic Reactions, Reactive Intermediates, Ionic Reactions Radical Reactions Bond Energy Reaction Energetics Activation Energy Reaction Rates and Kinetics Thermodynamic and Chemical Stability Aromaticity Benzene and Other Aromatic Compounds Fused Benzene Ring Compounds Other Aromatic Systems Factors Required for Aromaticity Stereoisomers Chirality and Symmetry Enantiomorphism Polarimetry Optical Activity Designating the Configuration of Stereogenic Centers The Sequence Rule for Assignment of Configurations to Stereogenic Carbons Compounds Having Two or More Stereogenic Centers Stereogenic Nitrogen Fischer Projection Formulas Aldehydes & Ketones Natural Products Synthetic Preparation Properties of Aldehydes & Ketones Reversible Addition Reactions Hydration & Hemiacetal Formation Acetal Formation Imine Formation Enamine Formation Cyanohydrin Formation Irreversible Addition Reactions Complex Metal Hydrides Organometallic Reagents Carbonyl Group Modification Wolff-Kishner Reduction Clemmensen Reduction Hydrogenolysis of Thioacetals Oxidations Reactions at the $\alpha$ -Carbon Mechanism of Electrophilic $\alpha$ -Substitution The Aldol Reaction Ambident Enolate Anions Alkylation of Enolate Anions Carboxylic Acids Natural Products Related Derivatives Preparation of Carboxylic Acids Reactions of Carboxylic Acids Salt Formation Substitution of Hydroxyl Hydrogen Substitution of the Hydroxyl Group Reduction & Oxidation Carboxylic Derivatives Reactions of Carboxylic Acid Derivatives Acyl Group Substitution Mechanism Reduction Catalytic Reduction Metal Hydride Reduction Diborane Reduction Reaction with Organometallic Reagents Reactions at the $\alpha$ Carbon Acidity of a C-H The Claisen Condensation Synthesis Applications Carbohydrates Glucose The Structure and Configuration of Glucose Anomeric Forms of Monosaccharides Glycosides Disaccharides Polysaccharides Lipids Fatty Acids Soaps & Detergents Fats & Oils Nucleic Acids Alkaloids Terpenes	
<b>Recommended literature:</b>	

1. on-line moodle.science.upjs.sk 2. Organic Chemistry, Clayden, Greeves Warren & Wothers, Oxford University Press, 2010 3. Organic Chemistry, Solomon, Willey, 2009					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 571					
A	B	C	D	E	FX
11.91	11.38	16.99	22.07	34.68	2.98
<b>Provides:</b> prof. RNDr. Jozef Gonda, DrSc., doc. RNDr. Miroslava Martinková, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚCHV/OCHU/03	<b>Course name:</b> Organic chemistry
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present	
<b>Number of credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> I.	
<b>Prerequisites:</b> ÚCHV/VCHU/15 or ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10	
<b>Conditions for course completion:</b> Two tests at lecture in 7 and 14th week. Test max 50 points. At least 25 points required. Written exam, 100 points. At least 49% of points required. Final evaluation: A 90-100 pts, B 80-89 pts, C 70-79 pts, D 60-69 pts, E 50-59 pts, FX 0-49 pts	
<b>Learning outcomes:</b> Basic organic chemistry course.	
<b>Brief outline of the course:</b> Chemical bonding Hybridization and Bonding Covalent bonds Double bonds and Triple Bonds Structural Formulas of Organic Molecules Polar Covalent Bonds and Electronegativity Constitutional Isomers Alkenes Electrophilic Additions Strong Brønsted Acids Lewis Acids (non-Proton Electrophiles) Electrophilic Halogen Reagents Other Electrophilic Reagents Reduction Oxidation Radical Additions Allylic Substitution Alkynes Addition Reactions Hydrogenation Electrophiles Hydration & Tautomerism Hydroboration Nucleophilic Addition & Reduction Acidity of Terminal Alkynes (Substitution of H) Alkyl Halides General Reactivity Substitution (of X) SN2 Mechanism SN1 Mechanism Elimination (of HX) Summary of Substitution vs. Elimination Substitution by Metals Elimination Reactions of Dihalides Alcohols Reactions of Alcohols Substitution of the Hydroxyl H Substitution of the Hydroxyl Group Elimination of Water Oxidation of Alcohols Reactions of Phenols Acidity of Phenols Ring Substitution of Phenols Oxidation to Quinones Aromatic compounds Electrophilic Substitution A Substitution Mechanism Reactions of Substituted Benzenes Reaction Characteristics Reactions of Disubstituted Rings Reactions of Substituent Groups Nucleophilic Substitution, Elimination & Addition Reactions Amines Basicity of Nitrogen Compounds Acidity of Nitrogen Compounds Important Reagent Bases Reactions of Amines Electrophilic Substitution at Nitrogen Preparation of 1°-Amines Preparation of 2° & 3°-Amines Reactions with Nitrous Acid Reactions of Aryl Diazonium Intermediates Elimination Reactions of Amines Oxidation States of Nitrogen Basic information: Aldehydes & Ketones Carboxylic Acids Carboxylic Derivatives Natural products	
<b>Recommended literature:</b> 1. on-line ppt presentation in MOODLE, moodle.science.upjs.sk 2. Organic Chemistry, Clayden, Greeves Warren & Wothers, Oxford University Press, 2010 3. Organic Chemistry, Solomon, Wiley, 2009	

<b>Course language:</b>					
<b>Course assessment</b>					
Total number of assessed students: 700					
A	B	C	D	E	FX
3.14	7.43	13.43	22.43	47.57	6.0
<b>Provides:</b> prof. RNDr. Jozef Gonda, DrSc., RNDr. Slávka Hamuláková, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KGER/OJPV1/07		<b>Course name:</b> Specialised German Language - Natural Sciences 1			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 136					
A	B	C	D	E	FX
21.32	22.79	25.0	22.06	8.09	0.74
<b>Provides:</b> Mgr. Andreas Schiestl					
<b>Date of last modification:</b> 25.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/ OLŠ/15		<b>Course name:</b> School Administration and Legislation			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3., 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 168					
A	B	C	D	E	FX
35.71	30.36	22.02	8.33	2.98	0.6
<b>Provides:</b> PaedDr. Renáta Orosová, PhD.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KOP/OPaPDV/14	<b>Course name:</b> Civil Law and Intellectual Property Rights
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 3., 5.	
<b>Course level:</b> I., N	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 67	
abs	n
94.03	5.97
<b>Provides:</b> doc. JUDr. Renáta Bačárová, PhD., LL.M., prof. JUDr. Peter Vojčík, CSc.	
<b>Date of last modification:</b> 18.01.2018	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/PACHU/03		<b>Course name:</b> Practical from Inorganic Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 <b>Per study period:</b> 56 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/VCHU/14 or ÚCHV/VCHU/15 or ÚCHV/VCHU/10 or ÚCHV/VACH/10					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> The practical acquirements at preparation and study of inorganic compounds and their physico-chemical properties by common laboratory techniques.					
<b>Brief outline of the course:</b> The utilization of common laboratory techniques for preparation of elements (H <sub>2</sub> , O <sub>2</sub> , Cu, Ni), oxides(CO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> ·xH <sub>2</sub> O), nitrides(Mg <sub>3</sub> N <sub>2</sub> ), acids (HNO <sub>3</sub> , H <sub>3</sub> BO <sub>3</sub> ), salts((NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , KMnO <sub>4</sub> ), binary salts(NH <sub>4</sub> )Fe(SO <sub>4</sub> ) <sub>2</sub> ·12H <sub>2</sub> O), halides (CuCl, CuCl <sub>2</sub> ·2H <sub>2</sub> O, SnI <sub>4</sub> , CuBr <sub>2</sub> ) and coordination compounds ([Cr <sub>2</sub> (CH <sub>3</sub> COO) <sub>4</sub> (H <sub>2</sub> O) <sub>2</sub> ], [CoCl <sub>2</sub> (en) <sub>2</sub> ]Cl, [Cu(NH <sub>3</sub> ) <sub>4</sub> ]SO <sub>4</sub> ·H <sub>2</sub> O, K <sub>3</sub> [Al(C <sub>2</sub> O <sub>4</sub> ) <sub>3</sub> ]·3H <sub>2</sub> O).					
<b>Recommended literature:</b> Z. Vargová, J. Kuchár: Praktikum z anorganickej chémie, Košice, 2008 M. Reháková, M. Dzurillová, V. Zeleňák, V. Urvichiarová: Laboratórna technika, PF UPJŠ, Košice, 1999					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 481					
A	B	C	D	E	FX
51.77	27.03	15.18	2.7	2.29	1.04
<b>Provides:</b> doc. RNDr. Juraj Kuchár, PhD., RNDr. Martin Vavra, PhD., RNDr. Miroslava Matiková-Maľarová, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ PACU/03		<b>Course name:</b> General Course of Analytical Chemistry - Laboratory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 <b>Per study period:</b> 56 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/ANCHU/03					
<b>Conditions for course completion:</b> Assessment					
<b>Learning outcomes:</b> Application of theoretical knowledge to analytical laboratory practise					
<b>Brief outline of the course:</b> Practical in qualitative and quantitative analysis. Qualitative analysis, separation by selective precipitation. Quantitative methods. Gravimetry, general principles of method. Volumetric methods. Preparation of accurate solutions. Indication of equivalency point. Titration curves, calculations in volumetric analysis. Acidimetry, alkalimetry. Manganometry. Iodometry. Complexometry. Selected Instrumental analytical methods.					
<b>Recommended literature:</b> D.Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000. D.A.Skoog: Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985. E.Prichard: Quality in the Analytical Chemistry Laboratory, Wiley, 1995					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 286					
A	B	C	D	E	FX
56.99	28.32	11.54	1.4	1.75	0.0
<b>Provides:</b> doc. Ing. Viera Vojteková, PhD., RNDr. Rastislav Serbin, PhD., RNDr. Livia Kocúrová, PhD., RNDr. Jana Šandrejová, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ PBCHU/15		<b>Course name:</b> Biochemistry Practical			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 <b>Per study period:</b> 56 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/BCHU/03					
<b>Conditions for course completion:</b> Protocols + 75 % continuous evaluation.					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> 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 $K_m$ and $V_{max}$ for urease. Isolation and detection of nucleic acids.					
<b>Recommended literature:</b> <a href="http://kosice.upjs.sk/~kbch/">http://kosice.upjs.sk/~kbch/</a>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 95					
A	B	C	D	E	FX
67.37	26.32	4.21	1.05	1.05	0.0
<b>Provides:</b> doc. RNDr. Mária Kožurková, CSc., RNDr. Nataša Tomášková, PhD., RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., RNDr. Eva Konkoľová, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ PCH1/00		<b>Course name:</b> Food chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> Students will receive informations and knowledges about chemical substances in food, their importance and chemical changes in food during processing and storage.					
<b>Brief outline of the course:</b> The main categories of substances in the most important group of food. Aminoacids, proteins, lipids, carbohydrates. Water, minerals, low concentration anorganic compounds, vitamins. Hydrocarbons, colorants, toxic compounds, aditives. Chemical reactions in dairy products.					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 256					
A	B	C	D	E	FX
60.55	33.98	5.08	0.0	0.0	0.39
<b>Provides:</b> RNDr. Ján Elečko, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> CJP/ PFAJ4/07	<b>Course name:</b> English Language of Natural Science
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 4.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 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.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> <b>ANGLICKÝ JAZYK PRE GEOGRAFOV:</b> Veda a výskum. Odbor geografia. Planéta Zem. Naša slnečná sústava. Zemetrasenia, Sopečná činnosť. Svetové oceány a ľadovce. Životné prostredie a geografia. Počasie a klíma. <b>ANGLICKÝ JAZYK PRE EKOLÓGOV:</b> 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 nomenklatury.  
**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/](http://web.ff.upjs.sk/vyuka/)  
Redman, S.: English Vocabulary in Use, Pre-intermediate, 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-intermediate, 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:** Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> CJP/ PFAJAKA/07		<b>Course name:</b> Academic English			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II., N					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> 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					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b> 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 <a href="http://www.bbclearningenglish.com">www.bbclearningenglish.com</a> Cambridge Academic Content Dictionary, CUP, 2009					
<b>Course language:</b> English language, level B2 according to CEFR.					
<b>Course assessment</b> Total number of assessed students: 344					
A	B	C	D	E	FX
30.81	23.55	15.99	11.05	7.27	11.34
<b>Provides:</b> Mgr. Zuzana Naďová					
<b>Date of last modification:</b> 06.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> CJP/ PFAJGA/07		<b>Course name:</b> Communicative Grammar in English			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II., N					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> 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.					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b> 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 <a href="http://www.bbclearningenglish.com">www.bbclearningenglish.com</a> Gráf T., Peters S.: Time to practise, Polyglot, 2007					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 394					
A	B	C	D	E	FX
39.34	18.53	17.01	8.88	6.09	10.15
<b>Provides:</b> Mgr. Lenka Klimčáková					
<b>Date of last modification:</b> 06.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> CJP/ PFAJKKA/07	<b>Course name:</b> Communicative Competence in English
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II., N	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 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.	
<b>Learning outcomes:</b> 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, schopnosť prijímať 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.	
<b>Brief outline of the course:</b> 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:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ PFCU/03		<b>Course name:</b> Practical in Physical Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Approved laboratory reports. Assessment.					
<b>Learning outcomes:</b> Theoretical principles, description of each technique and appropriate physical chemistry experiments.					
<b>Brief outline of the course:</b> Experimental verification of theoretical knowledge on thermodynamics, thermochemistry, chemical equilibria (determination of enthalpy, phase diagrams), colligative properties (cryoscopy, ebullioscopy), adsorption. Experimental verification of theoretical knowledge on electrochemistry (conductivity, dissociation constants, activity coefficients, electromotive force of galvanic cell, Daniell cell, potentials, polarography) and chemical kinetics (determination of rate constants).					
<b>Recommended literature:</b> B.P. Levitt: Findlay's Practical Physical Chemistry, Longman, London 1973 W.J. Moore: Physical Chemistry, Longman, London 1972 P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 288					
A	B	C	D	E	FX
70.83	22.92	5.21	0.69	0.35	0.0
<b>Provides:</b> RNDr. František Kaľavský, RNDr. Andrea Morovská Turoňová, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPPaPZ/PKŽ/15		<b>Course name:</b> Psychology of Everyday Life			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 116					
A	B	C	D	E	FX
43.1	14.66	30.17	8.62	2.59	0.86
<b>Provides:</b> Mgr. Ondrej Kalina, PhD.					
<b>Date of last modification:</b> 21.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ POCHU/15		<b>Course name:</b> Organic chemistry - Lab.			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 <b>Per study period:</b> 56 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/OCHU/03					
<b>Conditions for course completion:</b> Two tests 2x25 p., twelve reports 12x2 p., laboratory skills 12 p., short quizzes and questions 14 p. A 100 p. in total. Grades: A: 91-100b, B: 81-90b, C: 71-80b, D: 61-70b, E: 51-60b, Fx: 0-50b. Based on continuous evaluation.					
<b>Learning outcomes:</b> Students will become familiar with the basic isolation and purification methods used in a synthetic laboratory. Students should master basic laboratory technique and be able to apply the theoretical knowledge from the basic course of organic chemistry in simple synthetic projects.					
<b>Brief outline of the course:</b> Preparation, isolation, purification and identification of organic compounds. The emphasis is on gaining the experimental skills in synthesis of organic compounds, distillation, extraction, crystallization, sublimation and thin-layer chromatography.					
<b>Recommended literature:</b> 1. Handout with experimental procedures <a href="http://kekule.science.upjs.sk/pochu">http://kekule.science.upjs.sk/pochu</a> . 2. Organic chemistry lectures.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 110					
A	B	C	D	E	FX
54.55	27.27	10.0	7.27	0.91	0.0
<b>Provides:</b> RNDr. Slávka Hamuláková, PhD., RNDr. Mária Vilková, PhD., RNDr. Ladislav Janovec, PhD., RNDr. Ján Elečko, PhD., RNDr. Jana Špaková Raschmanová, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚFV/POF1a/99		<b>Course name:</b> Computational Physics I					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present							
<b>Number of credits:</b> 4							
<b>Recommended semester/trimester of the course:</b> 6.							
<b>Course level:</b> I.							
<b>Prerequisites:</b> ÚFV/NUM/10							
<b>Conditions for course completion:</b> Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.							
<b>Learning outcomes:</b> To teach students to use computer as a tool of modeling of physical reality.							
<b>Brief outline of the course:</b> 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. Elliptic and parabolic PDE. Introduction to Monte Carlo (MC) method and applications in statistical physics. MC simulations of lattice spin systems and stochastic processes.							
<b>Recommended literature:</b> 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, <a href="http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf">http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf</a> 5. W. Janke: Lectures on Ising model, <a href="http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html">http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html</a>							
<b>Course language:</b>							
<b>Course assessment</b> 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
<b>Provides:</b> doc. RNDr. Milan Žukovič, PhD.							
<b>Date of last modification:</b> 23.02.2018							

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák,  
PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPPaPZ/PP/15		<b>Course name:</b> Positive Psychology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4., 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 165					
A	B	C	D	E	FX
97.58	1.21	0.61	0.0	0.61	0.0
<b>Provides:</b> Mgr. Jozef Benka, PhD. et PhD.					
<b>Date of last modification:</b> 21.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ PPFM/15		<b>Course name:</b> Computer-Based Physical Measurement			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> active participation at all labworks written laboratory records with data analysis					
<b>Learning outcomes:</b> Students is able to measure physical quantities and gains skills important for measuring and data processing with the help of computer. The result is deeper conceptual understanding of physical phenomena involved in the labworks that is connected mainly with the content of courses General Physics I,II,III.					
<b>Brief outline of the course:</b> The content of the course involves labworks in physics aimed at selected problems of General Physics I,II,III. Student learns about different methods of measurement of physical quantities, he gains skills concerning measurement and data processing with the help of computer. The set of labworks involves analysis of different phenomena followed by the data processing and written report.					
<b>Recommended literature:</b> 1. Halliday, Hajko, V., Daniel-Szabó, J.: Základy fyziky, Veda Bratislava 1983 2. Veis, Š., Maďar, J., Martišovits, V.: Všeobecná fyzika 1, Alfa, Bratislava, 1987 3. Hlavička, A. a kol.: Fyzika pre pedagogické fakulty, SPN Praha, 1971 4. Halliday, D., Resnick, R., Walker, J.: Fyzika, part1-4, VUT Brno, 2000					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 17					
A	B	C	D	E	FX
64.71	11.76	23.53	0.0	0.0	0.0
<b>Provides:</b> doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD.					
<b>Date of last modification:</b> 01.03.2018					

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák,  
PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPPaPZ/PUDB/15		<b>Course name:</b> Drug Addiction Prevention in University Students			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3., 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 256					
A	B	C	D	E	FX
77.34	20.31	2.34	0.0	0.0	0.0
<b>Provides:</b> prof. PhDr. Oľga Orosová, CSc., Mgr. Marta Dobrowolska Kulanová, PhD.					
<b>Date of last modification:</b> 21.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/ Pg/15		<b>Course name:</b> Pedagogy			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3., 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 406					
A	B	C	D	E	FX
20.94	18.97	26.11	19.46	13.55	0.99
<b>Provides:</b> Mgr. Katarína Petriková, PhD.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPPaPZ/Ps/15		<b>Course name:</b> Psychology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 1., 3., 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 318					
A	B	C	D	E	FX
16.04	11.01	24.53	23.9	20.75	3.77
<b>Provides:</b> prof. PhDr. Oľga Orosová, CSc., PhDr. Anna Janovská, PhD., Mgr. Jozef Benka, PhD. et PhD.					
<b>Date of last modification:</b> 21.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/SCHM/14		<b>Course name:</b> Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 1					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I.					
<b>Prerequisites:</b> (ÚCHV/VCHU/10 or ÚCHV/VCHU/14 or ÚCHV/VCHU/15) and ÚCHV/ACHU/03 and ÚCHV/BCHU/03 and ÚCHV/FCHU/10 and ÚCHV/ANCHU/03 and ÚCHV/OCHU/03					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 86					
A	B	C	D	E	FX
23.26	38.37	22.09	10.47	5.81	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ SDFM1/15		<b>Course name:</b> Methods of Data Processing in Physics			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Five tasks in Matlab/Octave. Exam interview - 60%, tasks - 40%.					
<b>Learning outcomes:</b> Methods of data processing in physics.					
<b>Brief outline of the course:</b> 1. Numerical methods. 2. Regression analysis. 3. Computational physics.					
<b>Recommended literature:</b> Buchanan J. L., Turner P. R.: Numerical Methods and Analysis. McGraw-Hill, Inc., New York, 1992. Siegel A. F.: Statistics and Data Analysis. An Introduction. J. Wiley&Sons, NY, 1988.					
<b>Course language:</b> slovak, basics of english					
<b>Course assessment</b> Total number of assessed students: 2					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> doc. RNDr. Erik Čižmár, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPO/ SPKVV/15		<b>Course name:</b> Social and Political Context of Education			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4., 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 11					
A	B	C	D	E	FX
9.09	0.0	45.45	36.36	9.09	0.0
<b>Provides:</b> Dr.h.c. prof. PhDr. Marcela Gbúrová, CSc.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/STA1N/15		<b>Course name:</b> Statistical Physics			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/KVM/08 or ÚFV/KVM/15					
<b>Conditions for course completion:</b> Written test - maximum 30 points. Oral exam . maximum 70 points					
<b>Learning outcomes:</b> To acquaint students with basic principles of statistical mechanics and to illustrate possibilities of its applications in selected cases.					
<b>Brief outline of the course:</b> Basic laws of thermodynamics. The phase space, statistical ensemble, distribution function, canonical invariance of the phase volume. Liouville theorem, the ergodic problem and Tolman hypothesis. Microcanonical, canonical and grandcanonical ensembles. The virial and equipartition theorem. Applications of statistical physics.					
<b>Recommended literature:</b> 1) L. Reichl, A modern Course in Statistical Mechanics, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim (2009). 2.) R.K. Pathria, Statistical Mechanics, Butterworth.Heinemann, Oxford (2001).					
<b>Course language:</b> Slovak, English					
<b>Course assessment</b> Total number of assessed students: 20					
A	B	C	D	E	FX
30.0	20.0	25.0	15.0	10.0	0.0
<b>Provides:</b> prof. RNDr. Michal Jaščur, CSc., RNDr. Jana Čisárová, PhD.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ SVK/00		<b>Course name:</b> Students Scientific Conference (Presentation)			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 35					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ SVL1/03		<b>Course name:</b> Structure and Properties of Solids			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> 50% maintained output, written test 50% final exam					
<b>Learning outcomes:</b> To explain basic problems of Solid State physics. The course is mainly oriented on fundamental type of lattices, symetry and crystal structure, X.ray diffractometry, Thermal properties, mechanical properties and conductivity of solids. The course allows to continue education in specialized topics of Condensed Matter like: Magnetic properties, Low temperature physics, Experimental methods of CM, Semiconductors etc.					
<b>Brief outline of the course:</b> Periodic array of atoms. Fundamental type of lattices. Index systems for crystal planes. Simple crystal structure. Symetry and crystal structure. Point and space groups. Crystal binding and elastic constants. Wave diffraction and the reciprocal lattice. X.ray diffractometry. Brag's law, Laue conditions, scattering of x-rays, Neutrons and neutron scattering, CW - diffractometer, Ewald's sphere, Diffraction on powder samples, Structure factor, Occupation factor, Atomic displacement factor. Thermal properties. Phonon heat capacity, thermal conductivity. Free electron Fermi gas. Energy bands. Semiconductor crystals. Superconductivity.					
<b>Recommended literature:</b> 1. Ch. Kittel, Solid State Physics, Springer, 1985. 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					
<b>Course language:</b> english					
<b>Course assessment</b> Total number of assessed students: 44					
A	B	C	D	E	FX
45.45	18.18	18.18	13.64	2.27	2.27

<b>Provides:</b> prof. RNDr. Pavol Sovák, CSc.
<b>Date of last modification:</b> 01.03.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/TEP1/03		<b>Course name:</b> Theory of the Electromagnetic Field			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VFM1b/15 or ÚFV/VF1b/03					
<b>Conditions for course completion:</b> Two tests to deal with specific tasks theory of the electromagnetic field. Examination.					
<b>Learning outcomes:</b> To acquaint students with principles of a theory of the electromagnetic field.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> 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.					
<b>Course language:</b> 1. Slovak, 2. English					
<b>Course assessment</b> Total number of assessed students: 279					
A	B	C	D	E	FX
27.6	7.89	16.49	23.3	16.49	8.24
<b>Provides:</b> prof. RNDr. Andrej Bobák, DrSc., RNDr. Tomáš Lučivjanský, PhD.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/TMEU/15		<b>Course name:</b> Theoretical Mechanics			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VF1a/12 or ÚFV/VFM1a/15					
<b>Conditions for course completion:</b> Two tests to deal with specific tasks mechanics. Final examination.					
<b>Learning outcomes:</b> To acquaint students with principles of the theoretical mechanics.					
<b>Brief outline of the course:</b> Mechanics of particle system with constraints. Principle of virtual work and d'Alembert's principle. Lagrange's function and Lagrange's equations of motion. Hamilton's principle, Hamilton's function and Hamilton's canonical equations of motion. Mechanics of rigid body. Kinematics and dynamics of rigid body.					
<b>Recommended literature:</b> 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.					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 18					
A	B	C	D	E	FX
33.33	11.11	11.11	33.33	0.0	11.11
<b>Provides:</b> prof. RNDr. Andrej Bobák, DrSc.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPE/TVE/08		<b>Course name:</b> Theory of Education			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 4., 6.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 378					
A	B	C	D	E	FX
27.25	36.77	23.81	7.41	1.85	2.91
<b>Provides:</b> Mgr. Katarína Petriková, PhD.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVa/11		<b>Course name:</b> Sports Activities I.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present							
<b>Number of credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 1.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Conditions for course completion: Min. 80% of active participation in classes.							
<b>Learning outcomes:</b> Learning outcomes: Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.							
<b>Brief outline of the course:</b> 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.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Course assessment</b> 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:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVb/11		<b>Course name:</b> Sports Activities II.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present							
<b>Number of credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 2.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Conditions for course completion: Final assessment and active participation in classes - min. 75%.							
<b>Learning outcomes:</b> Learning outcomes: Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.							
<b>Brief outline of the course:</b> 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.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Course assessment</b> 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:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVc/11		<b>Course name:</b> Sports Activities III.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present							
<b>Number of credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 3.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b>							
<b>Learning outcomes:</b>							
<b>Brief outline of the course:</b>							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Course assessment</b> 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
<b>Provides:</b> 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.							
<b>Date of last modification:</b> 18.08.2017							
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVd/11		<b>Course name:</b> Sports Activities IV.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present							
<b>Number of credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 4.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b>							
<b>Learning outcomes:</b>							
<b>Brief outline of the course:</b>							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Course assessment</b> 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
<b>Provides:</b> 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.							
<b>Date of last modification:</b> 18.08.2017							
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.							



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ UAS/13		<b>Course name:</b> Introduction to Astronomy			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> 2 tests during term. Each test for 15 points. Minimal amounts of points for an exam is 20. Oral examination and test.					
<b>Learning outcomes:</b> Acquaint students with basic astronomy and astrophysic concepts, celestial coordinates, Solar system, formation and evolution of stars and galaxies					
<b>Brief outline of the course:</b> Subject of astronomy, celestial coordinates and their transformations, time and calendar, problem of 2 bodies, Astronomical telescopes, Solar system, radiation of stars and spectrum, properties of stars and their evolution, galaxies.					
<b>Recommended literature:</b> 1. Čeman, R., Pittich, E., 2002, Vesmír 1 - Slnečná sústava, MAPA Slovakia 2. Čeman, R., Pittich, E., 2003, Vesmír 2 - Hviezdy - Galaxie, MAPA Slovakia 3. Grygar, J., Horský, Z., Mayer, P., 1979, Vesmír, Mladá fronta 4. Kleczek, J., 2002, Velká encyklopedie vesmíru, Academia 5. Pittich, E., Kalmančok, D., 1981, Obloha na dlani, Obzor 6. Vanýsek, V.: 1980, Základy astronomie a astrofyziky, Academia					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 32					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> doc. Mgr. Štefan Parimucha, PhD.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚCHV/ UECH/03	<b>Course name:</b> Introduction to Environmental Chemistry
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Oral examination	
<b>Learning outcomes:</b> Introduction to topics in environmental chemistry and basic procedures applied for environmental protection.	
<b>Brief outline of the course:</b> Introduction to Environmental Chemistry Chemical aspects of pollution and environmental problems. Composition and behavior of the atmosphere. Energy balance of the Earth and climate changes. Principles of photochemistry, photoprocesses in the atmosphere. Petroleum, hydrocarbons and coal (characteristics, sources and environmental pollution). Soaps, polymers and synthetic surfactants. Haloorganics and pesticides. Environmental chemistry of some important elements (C, N, S, P, halogens, biologically important metals ...). Environmental chemistry in aqueous media. Aqueous systems, parameters, cycles and their protection. The Earth's crust (rocks, minerals, soils). Natural and artificial radioactivity, utilization. Energy and energy sources (fossil fuels, nuclear, geothermal, solar energy, wind and water energy). Solid waste disposal and recycling.	
<b>Recommended literature:</b> 1. Gary W. van Loon, Stephen J. Duffy : Environmental Chemistry - A Global Perspective, Oxford University Press, Oxford 2003 2. R.A. Bailey, H.M. Clark, J.P. Ferris, S. Krause, R.L. Strong : Chemistry of the Environment, Academic Press, San Diego 2002 3. G. Schwedt: The Essential Guide to Environmental Chemistry, Wiley and Sons, London 2001 4. R.N. Reeve, J.D. Barnes: General Environmental Chemistry, Wiley, London 1994 5. G. Burton, J. Holman, G. Pilling, D. Waddington: Chemical Storylines, Heinemann, Oxford, London 1994 6. www	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 209	

A	B	C	D	E	FX
48.8	20.57	15.79	8.61	6.22	0.0
<b>Provides:</b> doc. RNDr. Andrea Straková Fedorková, PhD.					
<b>Date of last modification:</b> 21.09.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> Dek. PF UPJŠ/USPV/13	<b>Course name:</b> Introduction to Study of Sciences
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 12s / 3d <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 1356	
abs	n
88.86	11.14
<b>Provides:</b>	
<b>Date of last modification:</b> 19.02.2018	
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ UVF/05		<b>Course name:</b> Introduction to General Physics			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Active presentation during the lessons twice a year Solved assignments Positive results at two written tests					
<b>Learning outcomes:</b> Conceptual understanding of the key concepts of the topics of Mechanics and Molecular Physics gained with the help of problem solving, physical experiments and multimedial support that is inevitable precondition for the further study at University level. At the end of this course the student will be able to follow with the courses proceeding from the course General Physics I.					
<b>Brief outline of the course:</b> The subject is a supportive subject to the course General physics 1 - Mechanics and Molecular Physics. The content involves key concepts in mechanics and molecular physics with the help of school experiments, interactive multimedial teaching materials and physical tasks and problems. The aim is to help students to overcome difficulties connected with knowledge gained during the previous study towards the conceptual understanding of the University course content.					
<b>Recommended literature:</b> 1. Sutton, R.M., Demonstration Experiments in Physics, AAPT, 2003 2. Pizzo, J.: Interactive Physics demonstration, AAPT, 2001 3. Cunningham, J, Herr, N.: Hands on Physics Activities, Jossey-Bass A Wiley Imprint, 1994 4. Halliday D., Resnick R., Walker J.: Fyzika. Část 1- 5., Vysokoškolská učebnica fyziky, VUTIUM, Brno, 2000 5. Walker, J.: The Flying Circus of Physics with answers, John Wiley&Sons, 2005 6. Hajko, V., Daniel-Szabó, J. a kol. Fyzika v príkladoch, Alfa, 1983					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 249					
A	B	C	D	E	FX
36.95	18.47	23.29	14.86	6.02	0.4

<b>Provides:</b> doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD.
<b>Date of last modification:</b> 01.03.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ UVF2/07		<b>Course name:</b> Introduction to General Physics II			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Active presentations during the lessons twice a year Solved assignments Positive results at two written tests.					
<b>Learning outcomes:</b> Conceptual understanding of the key concepts of the topics of Electricity and Magnetism with the help of problem solving, physical experiments and multimedial support that is inevitable precondition for the further study at University level. At the end of the course the student will be able to follow with the courses, proceeding from the course General physics II.					
<b>Brief outline of the course:</b> The subject is a supportive subject to the course General Physics 2 - Electricity and Magnetism. The content involves key concepts of electricity and magnetism with the help of school experiments, interactive multimedial teaching materials and physical tasks and problems. The aim is to help students to overcome difficulties connected with knowledge gained during the previous study towards the conceptual understanding of the University course content.					
<b>Recommended literature:</b> 1. Sutton, R.M., Demonstration Experiments in Physics, AAPT, 2003 2. Pizzo, J.: Interactive Physics demonstration, AAPT, 2001 3. Cunningham, J, Herr, N.: Hands on Physics Activities, Jossey-Bass A Wiley Imprint, 1994 4. Halliday D., Resnick R., Walker J.: Fyzika. Část 1- 5., Vysokoškolská učebnica fyziky, VUTIUM, Brno, 2000 5. Walker, J.: The Flying Circus of Physics with answers, John Wiley&Sons, 2005					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 206					
A	B	C	D	E	FX
40.78	19.42	21.84	8.74	9.22	0.0

<b>Provides:</b> doc. RNDr. Zuzana Ješková, PhD.
<b>Date of last modification:</b> 01.03.2018
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚFV/ VBFM1/15	<b>Course name:</b> General Biophysics I
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present	
<b>Number of credits:</b> 3	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Exam.	
<b>Learning outcomes:</b> To provide information about the object, significance and role of biophysics in science. The main emphasis will be given on the understanding of the principles determining the structure and function of the most important biological structures (nucleic acids, proteins, biomembranes) as well as on the thermodynamics and kinetics of selected chemical and biophysical processes.	
<b>Brief outline of the course:</b> The definition of biophysics and its role in the science. Intra- and inter-molecular interactions in biological systems. Function and structure of the important biomacromolecules (nucleic acids, proteins, biomembranes, sugars). Conformational transitions in biopolymers: helix-coil transition in DNA, denaturation of proteins, phase transitions in biomembranes. Thermodynamics of biological processes. Gibbs energy and chemical equilibrium, chemical potential, binding constants of the ligand-macromolecule interactions, cooperativity of the binding between biological important molecules, membrane potential. Kinetics of the chemical and biophysical processes. The principles of chemical kinetics, enzymatic reactions, inhibition of the enzymes, membrane transport, introduction to the pharmacokinetics. Cell biophysics. The basic bioenergetic processes, oxidative phosphorylation, photosynthesis. Mechanisms of regulations and control processes in cells-the basic principles. Medicinal biophysics. Biophysical principles of selected diagnostic and therapeutical methods. Radiation and environmental biophysics. The influence of physico-chemical factors of the environment on the living systems.	
<b>Recommended literature:</b> 1. M. B. Jackson, Molecular and cellular biophysics, Cambridge University Press, 2006. 2. M. Daune, Molecular biophysics - Structures in motion, Oxford University Press, 2004. 3. R. Glaser, Biophysics, Springer Verlag, 2001. 4. M.V. Volkenštein, Biofizika, Nauka, Moskva 1988. 5. W.Hoppe and W. Lohmann, Biophysics, Springer Verlag, 1988. 6. D.G. Nichols and S.J. Ferguson, Bioenergetics 3, Academic Press, Elsevier Science Ltd., 2002. 7. D. T. Haynie, Biological thermodynamics, Cambridge University Press, 2001.	

<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 6					
A	B	C	D	E	FX
16.67	33.33	50.0	0.0	0.0	0.0
<b>Provides:</b> doc. Mgr. Daniel Jancura, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚCHV/ VCHU/15		<b>Course name:</b> General Chemistry			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 7					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚCHV/CHV1/99					
<b>Conditions for course completion:</b> Written test in the middle and the end of the semester. Oral examination.					
<b>Learning outcomes:</b> To provide students with knowledge of atoms and molecules their electronic structure, theories of chemical bonds, physical properties of elements and compounds.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> 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.					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 150					
A	B	C	D	E	FX
16.0	24.0	39.33	12.67	8.0	0.0
<b>Provides:</b> prof. RNDr. Vladimír Zeleňák, PhD.					
<b>Date of last modification:</b> 26.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚFV/ VFM1a/15	<b>Course name:</b> General Physics I
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28 <b>Course method:</b> present	
<b>Number of credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Monitoring tests during the calculus lessons 1. in the 6th week 2. in the 12th week Final assessment is based on the results of : - oral examination assessment of the calculus lessons (written tests, overall performance during the lessons)	
<b>Learning outcomes:</b> Basic knowledge about the mechanics, molecular physics and thermodynamics.	
<b>Brief outline of the course:</b> 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 motion 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.	
<b>Recommended literature:</b> Hajko V., Daniel-Szabó J.: Základy fyziky, VEDA, Bratislava 1983. Veis Š., Maňar J., Martišovits V.: Všeobecná fyzika I., Mechanika a molekulová fyzika, ALFA Bratislava, 1987. Fuka J., Šíroká 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.	
<b>Course language:</b> Slovak	
<b>Course assessment</b> Total number of assessed students: 188	

A	B	C	D	E	FX
28.19	17.55	19.15	12.23	19.68	3.19
<b>Provides:</b> doc. RNDr. Zuzana Ješková, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/VFM1b/15		<b>Course name:</b> General Physics II			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VF1a/12 or ÚFV/VFM1a/15					
<b>Conditions for course completion:</b> Test. Oral examination.					
<b>Learning outcomes:</b> To obtain a general view on basic electric magnetic phenomena and ability to solve basic problems of this subject.					
<b>Brief outline of the course:</b> 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. Thermoelectric 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 substances. Magnetic polarization. Diamagnetism and paramagnetism, Magnetic ordering. Ferromagnetism.					
<b>Recommended literature:</b> I. S. Grant, W.R. Phillips, Electromagnetism, John Wiley&Sons, Ltd, England, 1990					
<b>Course language:</b> english					
<b>Course assessment</b> Total number of assessed students: 24					
A	B	C	D	E	FX
33.33	8.33	29.17	4.17	4.17	20.83
<b>Provides:</b> prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Erik Čižmár, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/VFM1c/15		<b>Course name:</b> General Physics III			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VF1b/03 or ÚFV/VFM1b/15					
<b>Conditions for course completion:</b> Exam+ 2 succesfull test from seminars					
<b>Learning outcomes:</b> The objective is to acquaint the students with the basis of oscilations, waves and optics.					
<b>Brief outline of the course:</b> Undamped oscilations, Mathematical, Physical and Torsional pendulum, Damped oscilations, Fourier transformation, Forced oscilations. Waves, their generation, waves equation. Interference. Huyghens principle. Reflection, diffraction. Doppler effect. Waves speed in materials. Acoustics. Geometrical optics. Mirrors, lens. Fotometry. Light as electromagnetic wave. Dispersion, absorption, interference, diffraction, polarization. Photon's theory of light. Law of emision and absorption, Planck's law of radiation. Lasers.					
<b>Recommended literature:</b> 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					
<b>Course language:</b> slovak					
<b>Course assessment</b> Total number of assessed students: 57					
A	B	C	D	E	FX
36.84	19.3	26.32	12.28	5.26	0.0
<b>Provides:</b> prof. RNDr. Rastislav Varga, DrSc.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/VFM1d/15		<b>Course name:</b> General Physics IV			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 / 2 <b>Per study period:</b> 56 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/VF1c/10 or ÚFV/VF1c/12 or ÚFV/VFM1c/15					
<b>Conditions for course completion:</b> written tests exam					
<b>Learning outcomes:</b> 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.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> 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, jadra, 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.					
<b>Course language:</b> slovak and english					
<b>Course assessment</b> Total number of assessed students: 16					
A	B	C	D	E	FX
81.25	6.25	12.5	0.0	0.0	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:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KFaDF/VKFV/07		<b>Course name:</b> Selected Topics in Philosophy of Education (General Introduction)			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 3., 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> KFaDF/DF1/05					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 0					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> doc. PhDr. Pavol Tholt, PhD., mim. prof.					
<b>Date of last modification:</b> 23.08.2017					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚFV/ ZFP1a/03	<b>Course name:</b> Physics Practical I
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present	
<b>Number of credits:</b> 3	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> I.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> The active work during semester and hand in all reports. Vindication of reports.	
<b>Learning outcomes:</b> Developing proper laboratory habits, skills and verify their theoretical knowledge.	
<b>Brief outline of the course:</b> 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: <ol style="list-style-type: none"> <li>1. Density measurements of liquids and solids.</li> <li>2. Radius measurements of spherical cap. Measurements of surface using planimeter.</li> <li>3. Gravitational acceleration measurements using mathematical and physical pendulum.</li> <li>4. Moment of inertia measurement using physical and torsion pendulum.</li> <li>5. Measurements of Young's modulus.</li> <li>6. Measurement of coefficient of viscosity.</li> <li>7. Measurement of the speed of sound.</li> <li>8. Measurements of general gas constant and Boltzmann constant.</li> <li>9. Measurements of thermal expansivity of air.</li> <li>10. Measurements of thermal capacity of matter.</li> <li>11. Measurement of the surface tension.</li> </ol>	
<b>Recommended literature:</b> Degro, J., Ješková, Z., Onderová, L., 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.					
<b>Course language:</b> english					
<b>Course assessment</b> Total number of assessed students: 224					
A	B	C	D	E	FX
58.04	25.0	12.05	4.02	0.89	0.0
<b>Provides:</b> doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzér, PhD., doc. RNDr. Jozef Hanč, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ZFP1b/03		<b>Course name:</b> Physics Practical II			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I.					
<b>Prerequisites:</b> ÚFV/ZFP1a/03					
<b>Conditions for course completion:</b> Measuring 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.					
<b>Learning outcomes:</b> The objectives of the laboratory are: a. To gain some physical insight into some of the concepts presented in the lectures. b. To gain some practice in data collection, analysis and interpretation of results. c. To gain experience and report writing presentation and results.					
<b>Brief outline of the course:</b> Students on practical exercises are working in pairs experimental tasks in the field of electrical, electromagnetic and magnetic properties of matters.					
<b>Recommended literature:</b> Tumanski S, Handbook of magnetic measurements, CRC press, 2011. Fiorillo F, Characterization and Measurement of Magnetic Materials, Elsevier, 2004.					
<b>Course language:</b> Slovak					
<b>Course assessment</b> Total number of assessed students: 190					
A	B	C	D	E	FX
63.16	21.58	13.16	1.58	0.0	0.53
<b>Provides:</b> doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzér, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ZFP1c/14		<b>Course name:</b> Physics Practical III			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Measurements of experimental tasks, their evaluation in the form of a written report, which must be defended. As a part of evaluation there is also a good theoretical preparation for the measurement of the task.					
<b>Learning outcomes:</b> 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.					
<b>Brief outline of the course:</b> 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.					
<b>Recommended literature:</b> Degro,J., Ješková, Z., Onderová,E., 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 fyzikálných měření, SPN Praha, 1981.					
<b>Course language:</b> slovak or english					
<b>Course assessment</b> Total number of assessed students: 42					
A	B	C	D	E	FX
83.33	9.52	2.38	2.38	2.38	0.0
<b>Provides:</b> doc. RNDr. Marián Kireš, PhD., doc. RNDr. Ján Füzér, PhD.					
<b>Date of last modification:</b> 01.03.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ZFP1d/14		<b>Course name:</b> Physics Practical IV			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 5.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> good theoretical preparation for measurement of the tasks, written tests, measurements of the experimental tasks, written reports of measurements					
<b>Learning outcomes:</b> Practice in nuclear physics.					
<b>Brief outline of the course:</b> Introduction to measurements. Dosimetry measurements. Analysing power of coincidence circuit by random coincidences. Statistic distribution of measured quantities. Measurement time scale selection. Absorption of beta rays. Backward scattering of beta rays. Scintillation gamma spectrometer. Determination of <sup>60</sup> Co preparat activity using beta-gamma coincidences. Emulsion detector. Franck Hertz experiment. Beta - spectroscopy. Energy dependence of the gamma-absorption coefficient.					
<b>Recommended literature:</b> 1. J.Vrláková, S.Vokál: Základné fyzikálne praktikum III, skriptá PF UPJŠ, Košice, 2012, dostupné na <a href="http://www.upjs.sk/public/media/5596/Zakladne-fyzikalne-praktikum-III.pdf">http://www.upjs.sk/public/media/5596/Zakladne-fyzikalne-praktikum-III.pdf</a>					
<b>Course language:</b> slovak					
<b>Course assessment</b> Total number of assessed students: 50					
A	B	C	D	E	FX
86.0	10.0	2.0	2.0	0.0	0.0
<b>Provides:</b> doc. RNDr. Janka Vrláková, PhD., doc. RNDr. Adela Kravčáková, PhD., RNDr. Filoména Sopková					
<b>Date of last modification:</b> 22.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚFV/ ZMF/17		<b>Course name:</b> Introduction to Mathematics for Physicists			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 2 <b>Per study period:</b> 14 / 28 <b>Course method:</b> present					
<b>Number of credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Course assessment</b> Total number of assessed students: 227					
A	B	C	D	E	FX
41.41	18.94	18.5	10.57	10.57	0.0
<b>Provides:</b> RNDr. Tomáš Lučivjanský, PhD., doc. RNDr. Jozef Hanč, PhD.					
<b>Date of last modification:</b> 23.02.2018					
<b>Approved:</b> Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zeleňák, PhD.					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ ÚTVŠ/CM/13	<b>Course name:</b> Seaside Aerobic Exercise
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> present	
<b>Number of credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 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	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Course assessment</b> Total number of assessed students: 33	
abs	n
12.12	87.88
<b>Provides:</b> Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.	
<b>Date of last modification:</b> 18.08.2017	

**Approved:** Guaranteeprof. RNDr. Peter Kollár, DrSc. Guaranteeprof. RNDr. Vladimír Zelenák,  
PhD.