COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 31

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

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/APC1/03

Course name: Practical Chromatography

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

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Laboratory reports.
Examination.

Learning outcomes:

Brief outline of the course:
Practical aspects of chromatographic instrumentation. Characterisation of HPLC functional composition, injector, column, detectors, data evaluation, errors. Instrumentation in GC, injector, columns, detectors, data evaluation. Practical examples.

Recommended literature:
Dean, R.: A Practical Guide to the Care, Maintenance, and Troubleshooting of Capillary Gas Chromatographic Systems. Huthig, Heidelberg,1991.
Grob, K.: On-Line Coupled LC-GC. Huthig, Heidelberg 1991.

Course language:

Course assessment
Total number of assessed students: 21

A	B	C	D	E	FX
85.71	4.76	4.76	4.76	0.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ APTF1/03	**Course name:** Surface and Thin Layers Analysis

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

Number of credits: 4

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

Course level: II.

Prerequisities:

Conditions for course completion:
Exam.

Learning outcomes:
General information about surafce analysis methods.

Brief outline of the course:
Surface definition, sensitivity and surface enhancement, mass spectrometry of secondary ions,general equations,characterization of monolayer. Primary ion beam, surface ionization, plasma. Mass spectrometric analysators, magnetic sector, quadrupole mass analyser, TOF analyser. Mechanism of secondary ions generation. Static TOF SIMS, dynamic TOF SIMS, scanning and imaging, TOF SNMS, XPS,AFM and other methods.

Recommended literature:
J.C. Vickerman: Surface Analysis, Wiley abd Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto 2002

Course language:

Course assessment
Total number of assessed students: 2

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

Provides: prof. RNDr. Andrej Oriňak, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ATV1/04	**Course name:** Water Pretreatment

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

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Test
Examination

Learning outcomes:
Getting a knowledge about the methods of water pretreatment.

Brief outline of the course:
Disinfection of drinking water. Fluoridation of drinking water. Water softening and demineralisation. Waste water. Neutralization of wastewater. Oxidation of wastewater. Physico–chemical methods of waste water treatment. Biological treatment of wastewater.

Recommended literature:
1. Handbook of Water and Wastewater Treatment Technologies. Ed. By Nicholas P Cheremisinoff, Butterworth Heinemann, 2001. 576 p.
2. Principles of Water Quality Control, Ed. by Thy Tebbutt, Butterworth Heinemann, 1997. 288 p.
3. Water Technology. Ed. by N. F. Gray, Butterworth Heinemann, 2005. 600 p.

Course language:

Course assessment
Total number of assessed students: 164

A	B	C	D	E	FX
36.59	14.02	18.29	18.29	12.8	0.0

Provides: prof. Mgr. Vasiľ Andruch, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BFC1a/01	**Course name:** Biophysical Chemistry I

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

Number of credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Examination

Learning outcomes:

Brief outline of the course:
Matter and its demonstration in living systems
Space and time connections in biological systems
Energy and mass connections in biological systems
Physicochemical properties of water and cell liquids
Reaction kinetics
Ligand binding
Nonequilibrium thermodynamics
Dynamics of conservative systems, chaos
Dissipative systems, attractors
Stability of biomacromolecules
Interfaces and membranes, membrane transports
Dynamics of complex biochemical process
Structuralization of biosystems induced by diffusion

Recommended literature:
Cantor,C.R.,Schimmel,P.R Biophysical Chemistry, W.H. Freeman and Co., S. Francisco,1980
P.Glansdorff, I.Prigogine, Thermodynamics theory of structure, stability and fluctuations, Willey 1971
Voet,D. Voet,J.G. Biochemistry, John Willey @Sons, 1990
Kersal E. van Holde, W. Curtis Johnson, P. Shing Ho: Principles of Physical Biochemistry, Prentise Hall, 1998
Articles from Journals
Marschall, A.G., Biophysical Chemistry, John Wiley & Sons, N.York, 1978
Hoppe, W., Lohmann, W., Markl, H., Ziegler, H., (eds.), Biophysics, Springer V., Berlin, 1983
Peitgen, H. O., Jurgens, H., Saupe, D., Fractals for the Classroom, Springer-Verlag, NY, 1992
Avnir,D (ed.)., The Fractal Approach to Heterogeneous Chemistry, John Wiley &S., NY,1989
Winfree, A. T., The Geometry of Biological Time, Springer-Verlag, NY, 1980
Harrison, L. G., Kinetic Theory of Living Pattrern, Cambridge Univ. Pres., NY, 1993

Course language:

Course assessment
Total number of assessed students: 152

A	B	C	D	E	FX
13.16	17.11	34.21	23.68	11.84	0.0

Provides: prof. Ing. Marián Antalík, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHMT/05	**Course name:** Materials Chemistry

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

Number of credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Seminar work.
Examination.

Learning outcomes:
To present the basic fundamentals of materials science and engineering.

Brief outline of the course:
Types and applications of materials. Synthesis, fabrication and processing of materials. Technical materials. Recent applications of technical materials. Principles of combined materials. Composites. Composites in history. Particulate composites. Filamentary composites. Nanomaterials. Semiconductors. Electric properties. Electronic and ionic conductivity. Biomaterials. Classification and function of biomaterials. Materials for third millenium. High-tech materials. Materials with intelligence and memory. Bionics and biomimetics. Materials and time. Ageing and fouling. Degradation processes in construction materials. Productional degradation. Operational degradation. Corrosion. Influence of hydrogen on metal properties. Selection of materials, requirements on materials. Principles of materials selection. Economic, environmental and societal issues in material chemistry. Investigation methods of the surface, structure and properties of materials.

Recommended literature:
W.D. Callister, Jr.: Fundamentals of Materials Science and Engineering, John Wiley & Sons, 2001.
L. Ptáček a kol.: Nauka o materiálu II., Akademické nakladatelství CERM, s.r.o., Brno 2002.

Course language:

Course assessment
Total number of assessed students: 19

A	B	C	D	E	FX	N	P
63.16	10.53	0.0	0.0	0.0	0.0	0.0	26.32

Provides: prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHRA1/03	**Course name:** Chromatographic Analysis

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

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Examination.

Learning outcomes:

Brief outline of the course:
General characteristics of chromatographic system and chromatographic separation. Analyte retention in chromatography, retention indices. Models used for chromatographic system description. Parameters affecting quality of chromatographic separation. Sensitivity, separated analytes, separation time, optimisation of chromatographic process. General equation of chromatography.
Evaluation of retention and selectivity of chromatographic process. Stationary phase. Qualitative chromatographic analysis. Quantitative analysis methods, sample preparation. System of analyte separation. Identification in chromatographic analysis.

Recommended literature:
D. A. Skoog, J. J. Leary: Principles of Instrumental Analysis, Saunders, 1992.

Course language:

Course assessment
Total number of assessed students: 59

A	B	C	D	E	FX
83.05	6.78	6.78	0.0	3.39	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 4

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 734

A	B	C	D	E	FX
60.63	13.9	12.67	8.72	3.41	0.68

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

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ELD1/03	**Course name:** Electrode Processes and Technology

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

Number of credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Test.
Examination.

Learning outcomes:
Basic explanation of the various electrochemical processes and its application in practical technology.

Brief outline of the course:
Theory of the electrode processes. Electrolyser construction.
Electrolysis of H2O. Electrolysis of NaCl. Electrolytical deposition and refining of metal from aqueous solutions, non-aqueous solution, from melts. Electrolysis of Al. Electrolytic deposition of the metal coatings on the substrates. Electrolytic coating of varnish for car industry. Principles of corrosion and surface protection.

Recommended literature:
M. Schlesinger, M. Paunovic: Modern Electroplating, Fourth Edition, New York, 2000.
J. O´M. Bockris, A. K. N. Reddy, M. Gamboa–Aldeco: Modern Electrochemistry, Fundamentals of Electrodies Vol. 2A, Second Edition, New York, 2000.

Course language:

Course assessment
Total number of assessed students: 19

A	B	C	D	E	FX
73.68	15.79	5.26	0.0	0.0	5.26

Provides: RNDr. Andrea Morovská Turoňová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ EMDP/03	**Course name:** Experimental Methods to Master´s Thesis

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 6 **Per study period:** 84
Course method: present

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 316

A	B	C	D	E	FX
94.94	2.85	0.63	0.63	0.95	0.0

Provides: RNDr. Martin Vavra, PhD., doc. RNDr. Peter Pristaš, CSc., doc. RNDr. Peter Javorský, DrSc., doc. RNDr. Ján Imrich, CSc., doc. RNDr. Mária Kožurková, CSc., prof. Ing. Marián Antalík, DrSc., prof. RNDr. Juraj Černák, DrSc., prof. RNDr. Jozef Gonda, DrSc., prof. RNDr. Andrej Oriňak, PhD., doc. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Renáta Oriňaková, DrSc., doc. RNDr. Ivan Potočňák, PhD., doc. RNDr. Erik Sedlák, PhD., doc. RNDr. Vladimír Zeleňák, PhD., doc. RNDr. Viktor Víglaský, PhD., doc. RNDr. Katarína Reiffová, PhD., RNDr. Miroslava Matiková-Maľarová, PhD., doc. RNDr. Juraj Kuchár, PhD., RNDr. Nataša Tomášková, PhD., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Dušan Koščík, CSc., RNDr. Daniela Kladeková, CSc., RNDr. Slávka Hamuľaková, PhD., RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., RNDr. Zuzana Kudličková, PhD., RNDr. Lívia Kocúrová, PhD., prof. Mgr. Vasiľ Andruch, DrSc., prof. Dr. Yaroslav Bazeľ, DrSc., RNDr. Ladislav Janovec, PhD., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., Mgr. Miroslav Almáši, PhD.

Date of last modification: 27.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ EMST/05	**Course name:** Electrophoretic Methods

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

Number of credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Examination

Learning outcomes:
Basic principles of electromigration techniques and their application in practise.

Brief outline of the course:
Principles and classification of electromigration techniques - Zone electrophoresis, The moving boundary method, Focusing methods, Capillary isotachophoresis (cITP), Capillary zone electrophoresis (CZE). Principle of separation in an electric field, the phenomena accompanying separation in an electric field - electroosmotic pressure, Joule heat, diffusion, gravity, adsorption, instrumentation, detection, qualitative and quantitative analysis, electrophoretic separation on a microchip. Micellar electrokinetic chromatography (MEKC).

Recommended literature:
1.Handbook of Capillary Electrophoresis, 2nd Ed., CRC, Boca Raton, 1997
2.P.Boček:Basic course and Advanced course of Isotachophoresis,Institute of Analytical Chemistry, Czech Academy of Science, Brno, 1984

Course language:

Course assessment
Total number of assessed students: 6

A	B	C	D	E	FX
16.67	83.33	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FCHIII/06	**Course name:** Physical Chemistry III

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

Number of credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Assesessment of student´s performance in seminars and homeworks.
Examination.

Learning outcomes:
To educate students in advanced theory and applications of physical chemistry and physicochemical methods in accord with present-day knowledge.

Brief outline of the course:
Theory of chemical bonds. Molecular structure and propertiies of molecules in solid and liquid state. Constitution, configuration and conformation. Mechanical, electrical, magnetical and optical properties of molecules. Molecular spectroscopy. Absoprption UVVIS, IR spectroscoy (repetition from basic courses). Mass spectrometry of a gaseous phase and transfer to a real processes. Femtosecond vibration spectroscopy, Raman spectroscopy and surface enhanced Raman spectroscopy. Surface plasmon resonance, nanostructured surfaces. Effect of nanostructure on intensity of surface plasmon resonance. Mie theory. Laser ionisation spectroscopy, fluorescent spectroscopy and analysis of one molecule. soft matter RTG SAXS, neutron analysis. Nanofluidic sstems and nanodevices.

Recommended literature:
T. Engel, P. Reid: Physical Chemistry, Pearson Educat. Inc., San Francisco 2006
P.W. Atkins : Physical Chemistry, Oxford University Press, Oxford 1998
W.R. Fawcett: Liquids, Solutions and Interfaces, Oxford University Press, Inc., New York 2004.
M. Hesse, H. Meier, B. Zeeh: Spectroscopic Methods in Organic Chemistry. Thieme, 1997.
Peter C. Schmidt: Methods in Physical Chemistry, Wiley-VCH Verlag GmbH and Co., 2012.
Recent scientific references.

Course language:

Course assessment
Total number of assessed students: 20

A	B	C	D	E	FX	N	P
80.0	10.0	0.0	0.0	10.0	0.0	0.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD.
Date of last modification: 24.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FEM/03	**Course name:** Electroanalytical Methods

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

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Survey on principles, theoretical background and practical applications of modern electroanalytical methods.

Brief outline of the course:
Importance of electroanalytical methods for environmental control and protection, requirements of practice, electrochemical cells, electrode potential, mass transfer by convection, migration and diffusion, Cottrell equation, direct current voltametry and polarography (principle, theoretical backround, examples of practical application). TAST polarography and voltametry, staircase voltammetry, pulse techniques: normal pulse and differential pulse voltammetry and polarography, square - wave voltammetry and polarography, AC polarography and voltammetry, anodic stripping voltammetry, adsorptive (or accumulation) voltammetry (applications in clinical and environmental analysis), working electrodes in voltammetry: stationary mercury electrode, mercury film electrode, glassy carbon electrode, carbon paste electrode, metallic electrodes, rotating disk electrode, rotating ring-disk electrode, ultramicroelectrodes, chemically modified electrodes, potentiometry, principles of ion selective electrodes, glass electrodes, ISE with solid and liquid membranes, biocatalytic membrane electrodes, chronopotentiometry, potentiometric stripping analysis, electroanalytical detectors in flow systems, amperometric titrations, biamperometric and bipotentiometric titrations, potentiostatic and galvanostatic coulometry.

Recommended literature:
F. Scholtz: Electroanalytical Methods, Springer Verlag, Heidelberg 2002, ISBN 3-540-42449-3.
J. Wang: Analytical Electrochemistry, VCH Publ., New York 1994, 2000.
R. Kalvoda (Ed.): Electroanalytical Methods in Chemical and Environmental Analysis, Plenum Publ. Corp., New York 1987.
A. J. Bard, L. R. Faulkner: Electrochemical Methods, John Wiley and Sons, New York 1980.
T. Riley, A. Watson: Polarography and Other Voltametric Methods, John Wiley and Sons, Chichester 1987.
J. Wang: Stripping Analysis, VCH Publ. Inc., Deerfield Beach 1985.

Course language:

Course assessment

Total number of assessed students: 32

A	B	C	D	E	FX
59.38	25.0	12.5	3.13	0.0	0.0

Provides: doc. RNDr. Andrea Straková Fedorková, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/FKC/00 | **Course name:** Colloid Chemistry Practicals

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

Number of credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Approved laboratory reports
Assessment

Learning outcomes:
To give an introduction to technically important applications of colloid and surface chemistry.

Brief outline of the course:
Surface effects. Adsorption at interface of solid and liquid phases, determination of surface nature. Electrical properties. Stability and coagulation of colloids. Structure-mechanical properties of colloids. Properties and aggregation of surfactants and micelles. Rheological properties.

Recommended literature:
B.P. Levitt: Findlay´s Practical Physical Chemistry, Longman, London 1973
Internal textbooks

Course language:

Course assessment
Total number of assessed students: 11

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

Provides: RNDr. František Kaľavský

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FKC1/03	**Course name:** Colloid Chemistry

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

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Approved calculation exercises tests and an approved written examination
Examination

Learning outcomes:
To clarify basic physicochemical principles of colloid disperse systems (size of dispersed particles is from 1 nanometre to 1 micrometre) to understand several important problems of technology and nature.

Brief outline of the course:
Classification and characterization of dispersed systems. Heterogeneity of colloidal systems. Optical properties of colloids. Theory of light scattering. Molecular-kinetic properties. Brownian motion, diffusion, osmosis, and sedimentation. Adsorption-basic concepts. Electrokinetic phenomena and their application. Structure, stability and coagulation of colloids. Rheology of dispersed systems. Gels. Aerosols. Solid dispersions, emulsions and foams. The theory is applied during laboratory and calculation exercises.

Recommended literature:
W.J. Moore: Physical Chemistry, Longman, London 1972
P.C. Hiemenz: Principles of Colloid and Surface Chemistry, M. Dekker, New York 1986
P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002

Course language:

Course assessment
Total number of assessed students: 22

A	B	C	D	E	FX
86.36	4.55	9.09	0.0	0.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FKK1/03	**Course name:** Kinetics and Catalysis

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

Number of credits: 5

Recommended semester/trimester of the course: 1.

Course level: II., III.

Prerequisities:

Conditions for course completion:
Test.
Examination.

Learning outcomes:
Detailed and particular explanation of different types of reactions, homogeneous and heterogeneous catalysis.

Brief outline of the course:
Classification of chemical reactions. Reaction rates. Rate laws. Reaction order. Elementary reactions. Complicated reactions. Theory of chemical kinetics. Experimental methods of chemical kinetics. Complex reactions mechanism. Explosions. Photochemical reactions. Essence of adsorption, types of adsorption, adsorption isotherms. Essence of catalytic processes. Catalysis influenced phenomena. Homogeneous and heterogeneous catalysis. Enzymatic catalysis.

Recommended literature:
P. W. Atkins : Physical Chemistry,Oxford University Presss, Oxford 1986, 1990, 1994, 1998.
Richard I. Masel: Chemical Kinetics & Catalysis,Wiley-Interscience, 2001.
I. CHORKENDORFF, J. W. NIEMANTSVERDRIET: Fundamentals of Kinetics and Catalysis, CONCEPTS OF MODERN CATALYSIS AND KINETICS,
Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, 2003.

Course language:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX	N	P
75.76	6.06	3.03	0.0	0.0	0.0	0.0	15.15

Provides: prof. RNDr. Renáta Oriňaková, DrSc., RNDr. František Kaľavský

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FMP1/03	**Course name:** Modelling of Physicochemical Processes

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

Number of credits: 6

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
Seminar work.
Examination.

Learning outcomes:
To explain general principles of modelling, to report the examples of mathematic models of basic physicochemical processes.

Brief outline of the course:
Modelling and processes control. General principles of modelling. Examples of mathematical models of processes dynamics. Dynamic properties of processes. Dynamic characteristics of processes. Computational models.

Recommended literature:
William L. Luyben: Process Modeling, Simulation, and Control for Chemical Engineers (2nd edition), McGraw-Hill College, 1990.
Richard G. Rice, Duong D. Do, D. Do Duong: Applied Mathematics and Modeling for Chemical Engineers, John Wiley & Sons Inc, 1995.

Course language:

Course assessment
Total number of assessed students: 20

A	B	C	D	E	FX	N	P
75.0	0.0	5.0	0.0	0.0	0.0	0.0	20.0

Provides: prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FOCHP1/04	**Course name:** Corrosion and Surface Protection

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

Number of credits: 5

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Test.
Examination.

Learning outcomes:
To present the basic fundamentals of chemical and electrochemical degradation processes of the metals, included specific types of corrosion and surface protection.

Brief outline of the course:
Chemical corrosion of metals. Chemical and electrochemical degradation processes, specific forms of corrosion. Oxidic layers. Vanadic corrosion. Hydrogen corrosion. Chemical corrosion in nonelectrolytes. Electrochemical corrosion. Electrode potentials.
Thermodynamics and kinetics of electrochemical corrosion. Corrosion influence on the quality and properties of the materials. Contact corrosion. Soil corrosion. Surface protection. Electrochemical protection. Corrosion properties of the Cu, Al, Ti, Zn, Mg, Sn and Pb.
Ecological aspects of the corrosion and metal protection.

Recommended literature:
P. R. Roberge: Corrosion Basics, An Introduction, NACE International, 2006.
D. Jones: Principles and Prevention of Corrosion, 2nd edition, Upper Saddle River, New Jersey, Prentice Hall, 1996.

Course language:

Course assessment
Total number of assessed students: 12

A	B	C	D	E	FX
91.67	0.0	0.0	8.33	0.0	0.0

Provides: RNDr. Andrea Morovská Turoňová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FVE1/04	**Course name:** Selected Chapters on Electrochemistry

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

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Examination

Learning outcomes:
To provide the students with basic knowledge of electric double layer theory and fundamentals of electrochemical kinetics.

Brief outline of the course:
Equilibrium at electrified interfaces, classification of electric potentials. Electric double layer, electrocapillaric phenomena, capacity of the electric double layer, adsorption phenomena at the electrode/solution interface. Structure of the electrical double layer according to Helmholtz model, Gouy - Chapman model, Stern model, jellium model. Colloid chemistry: interaction of double layers and stability of colloids.
Fundamentals of electrochemical kinetics, the Butler-Volmer equation, charge transfer coefficient, heterogeneous rate constant, exchange current density, transport processes and their influence on electrode kinetics. Reaction overvoltage.
Galvanic cells (chemical and concentration cells). Electromotive force of the galvanic cell. Thermodynamics of the galvanic cell. Primary and secondary cells, examples of modern electric energy power sources.
Electrolytic deposits, their preparation and characteristic, adhesion. Electrolytic deposition of metals and semiconductors. Electrochemical preparation of non-conductive deposits. Conductive organic polymers - preparation and properties.
Electrochemistry at the atomic scale, scanning tunneling microscope. Electrochemical quartz crystal microbalance.

Recommended literature:
A. J. Bard, L. R. Faulkner: Electrochemical Methods, Fundamentals and Applications, John Wiley and Sons, New York 1980
J. Koryta, J. Dvořák, L. Kavan: Principles of Electrochemistry, John Wiley & Sons, New York 1993
J. O´M. Bockris, A. K. N. Reddy: Modern Electrochemistry, Macdonald, London 2002
E. Scholz (Ed.): Electroanalytical Methods, Guide to Experiments and Applications, Springer Verlag, Berlin 2002

Course language:

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
33.33	55.56	11.11	0.0	0.0	0.0

Provides: prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/FYCH/01	**Course name:** Physical Chemistry

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

Number of credits: 4

Recommended semester/trimester of the course: 3., 4..

Course level: II.

Prerequisities: ÚCHV/FCHIII/06 and ÚCHV/TED/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 8

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

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KFaDF/ IH2/03	**Course name:** Idea Humanitas 2 (General Introduction)

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 8

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

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ JCH1/04	**Course name:** Nuclear Chemistry

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

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Test.
Examination.

Learning outcomes:
To explain a basic of radioactivity and nuclear reactions.
The course is to provide the students with a knowledge of preparation of the radionuclides and its use in the technical practise, to give the survey of biological effects of nuclear radiation.

Brief outline of the course:
Fundamentals of nuclear chemistry. Elementary particles. Nuclear core. Nuclides and isotopes. Radioactivity and radioactive disintegration kinetics. Radioactive disintegration. Decay law. Half life period. Units of radioactivity. Nuclear reactions. Sources of nuclear radiation. Detection and registration of radiation. Nuclear chemical technology. Radioactive analytical methods. Isotopic dilution method, activation analysis. Biological effects of the nuclear radiation. Nuclear medicine. Nuclear power station.

Recommended literature:
G. R. Choppin, J. Rydberg: Nuclear Chemistry, Theory and Applications, Pergamon Press, 1980.
G. R. Choppin, J. O. Liljenzin, J. Rydberg: Radiochemistry and Nuclear Chemistry, 3rd edition, Woburn, USA, Butterworth-Heinemann, 2002.
W. D. Ehmann, D. E. Vance: Radiochemistry and Nuclear Methods of Analysis, Wiley, New York, 1991.
A. Vértes, I. Kiss: Nuclear Chemistry, Elsevier, 1987.

Course language:

Course assessment
Total number of assessed students: 37

A	B	C	D	E	FX
37.84	24.32	18.92	10.81	5.41	2.7

Provides: RNDr. Andrea Morovská Turoňová, PhD., RNDr. František Kaľavský

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 10

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

Provides: doc. PhDr. Pavol Tholt, PhD., mim. prof.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/KK/07	**Course name:** Communication and Cooperation

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 281

abs	n	z
98.22	1.78	0.0

Provides: Mgr. Ondrej Kalina, PhD., Mgr. Lucia Hricová, PhD.

Date of last modification: 16.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ KOC1/01	**Course name:** Quantum Chemistry

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

Number of credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Activity within practice will be evaluated. Two written tests will be realized in 7-th and 14-th week, resp. during the term of the course.
The examination will consist of written and verbal test. Continuous evaluation will be also taken into account.

Learning outcomes:
Students will intensify their knowledge in the field of valence-bond based on molecular orbital theory (MO) and self-reliant perform basic quantum chemical calculations (molecular geometry optimization, transition states, vibrational analysis, etc.).

Brief outline of the course:
Development of valence-bond theory. Time-independent Schrodinger equation. Basic approximations in molecular orbital valence-bond theory. Variant methods of calculation in the framework of molecular orbital valence-bond theory. Chemical reactivity. Potential energy hypersurfaces of molecules. Reaction coordinate. Calculation of the absolute and relative equilibrium and rate constants, resp. in gas phase. Solvatation energy calculation.

Recommended literature:
1. Jensen F.: Introduction to Computational Chemistry, Wiley,2000.
2. Leach A. R.: Molecular Modelling, Addison Wesley Longman Ltd. 1998.
3. Náray-Szabó G., Surján P. R., Ángyán J. G.: Applied Quantum Chemistry, Akadémia Kiadó, Budapest, 1987.

Course language:
slovak language and english language

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
81.48	14.81	3.7	0.0	0.0	0.0

Provides: RNDr. Ladislav Janovec, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ KP/12	**Course name:** Survival Course
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 36s **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 329	

abs	n
47.11	52.89

Provides: MUDr. Peter Dombrovský, Mgr. Marek Valanský
Date of last modification: 23.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ LKSp/13	**Course name:** Summer Course-Rafting of TISA River
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 36s **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 126	

abs	n
45.24	54.76

Provides: Mgr. Peter Bakalár, PhD.
Date of last modification: 23.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MAR1/04

Course name: Mechanisms of Inorganic Reactions

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

Number of credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
two written tests

Learning outcomes:
Basic knowledges about inorganic reaction mechanisms and its application, mainly in some new technological proceses.

Brief outline of the course:
Introduction of inorganic reaction mechanisms. Relationship between mechanism and structure of reactants. Classification of reaction mechanism. Kinetic of reactions and mechanism. Inclusion compounds, intercalates. Mechanism of photochemical reactions, photochromical reactions and its application. Electrochromism, electrochromic materials and its application. Photovoltaic systems. Homogeneous and heterogeneous catalysis mechanism. Mechanisms of reactions of coordination and biocoordination compounds.

Recommended literature:
1. Housecroft C.E., Sharpe A.G.: Inorganic Chemistry. Pearson Education Limited, Harlow 2005.
2. Shriver D. F., Atkins P. W., Overton T. L., Rourke J.P., Weller M.T., Armstrong F.A.: Inorganic Chemistry. Oxford University Press, Oxford 2006.
3. Tobe M.L.: Inorganic Chemistry-Reaction Mechanism in Inorganic Chemistry. vol.9.Butterworths, London 1974.

Course language:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX
57.58	15.15	9.09	15.15	3.03	0.0

Provides: doc. RNDr. Mária Reháková, CSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MCV1/03 | **Course name:** Methods of Chemical Research

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

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: II., III.

Prerequisities:

Conditions for course completion:
The students are expected to actively participate in seminars by demonstrating solutions to selected problems (a presentation of a real problem) in front of their course-fellows.
Examination

Learning outcomes:
To make students known with the physicochemical parameters´means of measurement, evaluation, and interpretation for the study of the process, i.e. the rate of reaction, mechanism, intermediates and final products in both homogeneous and heterogeneous systems.

Brief outline of the course:
Overview of basic principles of the determination of physicochemical quantities (dissociation constant, activity coefficient, solubility product, stability constant of complex, diffusion coefficient). Calorimetry and its utilisation. Experimental methods in kinetics. The Butler-Volmer equation. Survey of selected key topics in colloid chemistry. Adsorption-BET equation. Determination of molecular mass of macromolecules. A discussion of topics selected from active research fields.

Recommended literature:
W.J. Moore: Physical Chemistry, Longman Group Limited, London 1972
H. H. Willard et al.: Instrumental Methods of Analysis, Wadsworth, Belmont 1988
J. Koryta, J. Dvořák, L. Kavan: Principles of Electrochemistry, John Wiley & Sons, New York 1993
P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002
D. Kladeková: Supportive Textbooks in Course: Methods of Chemical Research, The ESF project no. SOP HR 2005/NP1-051 11230100466, Košice 2008

Course language:

Course assessment
Total number of assessed students: 35

A	B	C	D	E	FX	N	P
48.57	28.57	2.86	5.71	0.0	0.0	0.0	14.29

Provides: doc. RNDr. Andrea Straková Fedorková, PhD.
Date of last modification: 24.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MHC1/09	**Course name:** Methods of mass spectrometry

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

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Seminar work. Exam.

Learning outcomes:

Brief outline of the course:
Popis metódy hmotnostnej spektrometrie, princípy a usporiadanie. Zloženie hmotnostého spektra, fragmentačné schémy, molekulový ión. Rozlíšenie v MS. Matricou asistované ionizačné procesy v MS. Laserová desorpčná MS. Hmotnostná spektrometria sekundárnych iónov. Tandemová MS a kombinácia chromatografie s MS. MS v miniatrurizovaných systémoch. MS pri reálnom tlaku a senzory v hmotnostnej spektrometrii.

Recommended literature:
J.C. Vickerman: Surface Analysis, Wiley abd Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto 2002

Course language:

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX
83.33	4.17	8.33	0.0	4.17	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MMU/03	**Course name:** Macromolecular Chemistry

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

Number of credits: 4

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Test. Examination

Learning outcomes:
To make students familiar with available structures of polymers and their synthesis methods as well as with structure reflection in their properties.

Brief outline of the course:
Fundamental aspects of chemical composition of polymers-monomers, shape and the relationship between structure and properties. Primary, secondary, tertiary and quaternary structures. Thermal transition. Chain polyreactions. Step polyreactions. Synthetic methods of functional polymers and their characterisation. Naturally occurring polymers, their properties. Degradation of polymers. Molecular mass distributions. Determination of molecular mass of macromolecules. Polymers and environment.

Recommended literature:
H.-G Elias: Macromolecules, Volume 1 (Structure and Properties); Volume 2 (Synthesis, Materials, and Technology), Plenum Press, New York 1984
W.J. Moore: Physical Chemistry, Longman, London 1972
P. Munk: Introduction to Macromolecular Science, John Wiley & Sons, New York 1989
P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002

Course language:

Course assessment
Total number of assessed students: 21

A	B	C	D	E	FX
52.38	19.05	19.05	9.52	0.0	0.0

Provides: RNDr. Andrea Morovská Turoňová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MSO1/03	**Course name:** Wastes Treatment Methods

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

Number of credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Wastes clasiffication, wastes separation. Re-cycling of wastes, methods of wastes elimination and re-finishing. Pyrolysis, degradation of wastes by pyrolysis, process optimization.Analytical methods for wastes analysis. Monitoring of wastes degradation pollutants, toxicity of wastes and degradation products.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 68

A	B	C	D	E	FX
70.59	26.47	2.94	0.0	0.0	0.0

Provides: Mgr. Mária Sabalová, PhD., Mgr. Ján Macko, PhD., Mgr. Marek Hruška

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ NATE/12	**Course name:** Nanotechology II

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

Number of credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam.

Learning outcomes:
To provide the students with basic knowledge of inovative nanotechnology, nanoproducts, nanomaterials and processes.

Brief outline of the course:
Types of nanostructures. Nanomaterials and their application: nanoliquids, metallic nanomaterials, carbon nanomaterials, inorganic nanomaterials, composite nanomaterals, nanomaterals for electronics, biomedical nanomaterials. Nanotechnology today and in the future. Health hazards of nanotechnology.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
73.33	26.67	0.0	0.0	0.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., doc. RNDr. Andrea Straková Fedorková, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

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

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

Number of credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

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

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

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

Recommended literature:
1. Friebolin H.: Basic One- and Two-Dimensional NMR Spectrocopy, 5. Ed., Wiley, 2010.
2. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, Elsevier, 1999.
3. Atta-ur-Rahman, M. I. Choudhary: Solving Problems with NMR spectroscopy, Academic Press 1996.
4. H.-O. Kalinowski, S. Berger, S. Braun: Carbon-13 NMR Spectroscopy. Wiley, New York 1988.
5. A. E. Derome: Modern NMR Techniques for Chemistry Research. Pergamon Press, Oxford 1987.
6. E. Pretsch, B. Buhlmann, C. Affolter: Structure Determination of Organic Compounds. Tables of Spectral Data. Springer Verlag, Berlin 2000.
7. E. Breitmaier: Structure Elucidation by NMR in Organic Chemistry: A Practical Guide, 3rd Ed., Wiley, 2002.
8. E. Breitmaier, W. Voelter: Carbon-13 NMR Spectroscopy. VCH Weinheim, 1990.

Course language:

Course assessment
Total number of assessed students: 151

A	B	C	D	E	FX
38.41	25.83	23.84	9.93	1.99	0.0

Provides: doc. RNDr. Ján Imrich, CSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ODPFC/01	**Course name:** Defence of Diploma Thesis

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

Number of credits: 20

Recommended semester/trimester of the course: 3., 4..

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX
95.83	0.0	4.17	0.0	0.0	0.0

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PBACH1/03	**Course name:** Practical in Bioanalytical Chemistry

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

Number of credits: 3

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

Course level: II.

Prerequisities:

Conditions for course completion:
Assessment

Learning outcomes:
Application of theoretical knowledge to bioanalytical laboratory practise

Brief outline of the course:
Analytical chemistry in laboratory medicine, basic analysis of biological systems, the nature and processing of biological samples, enzymes in bioanalysis, immunochemical methods, radioimunoanalytical methods (RIA), electrophoretic methods, analytical significance of nucleic acid, selected separation methods for the analysis of biomolecules.

Recommended literature:
1. Mikkelsen S.R, Cortón E.: Bioanalytical Chemistry, Wiley, 2004
2. Wilson I.: Bioanalytical Separations 4, (Handbook of Analytical Separations), Elsevier, 2003
3. Suelter C.H.,Kricka L.J.: Methods of Biochemical Analysis, Vol.37, Bioanalytical Instrumentation, Wiley, 1994
4. Rodriguez-Diaz R., Wehr T., Tuck S.: Analytical Techniques for Biopharmaceutical Development, Marcell Dekker, 2005

Course language:

Course assessment
Total number of assessed students: 0

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

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/POP/15	**Course name:** Pokročilé praktikum z fyzikálnej chémie

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 6 **Per study period:** 84
Course method: present

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Previous semstral experimental Works.

Learning outcomes:
Master degree thesis.

Brief outline of the course:
Experimental laboratory work with selected problems of master degree thesis.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 11

abs	n
100.0	0.0

Provides: doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Lenka Lorencová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: Dek. PF UPJŠ/PPZ/13	**Course name:** Personality Development and Key Competences for Success on a Labour Market

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

Number of credits: 2

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 39

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

Provides: RNDr. Peter Stefányi, PhD.

Date of last modification: 13.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/PPZMg/12	**Course name:** Psychology and Health Psychology (Master´s Study)

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

Number of credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 226

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

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

Date of last modification: 16.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ROP/15	**Course name:** Ročníkový projekt

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 6 **Per study period:** 84
Course method: present

Number of credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Experimental work in physical chemistry laboratory, evaluation of results, discussion, results presentation, seminars and scientific meetings.

Learning outcomes:
Project work and presentation.

Brief outline of the course:
Experimental work in research field for master degree . Evaluation of results and verbal presentation and discussion about.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 27

abs	n
100.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., prof. Mgr. Vasiľ Andruch, DrSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Jozef Gonda, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SDP/03	**Course name:** Seminar to Diploma Thesis

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

Number of credits: 2

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

Course level: II.

Prerequisities:

Conditions for course completion:
Consultations, discussions and presentations.
Assessment of student's work during the semester by supervisor.

Learning outcomes:
Teach the student to prepare presentation of his own results, critical acceptation of information, participate in scientific discussion and formal requirements of written diploma work.

Brief outline of the course:
Presentation of literature information and own experimental results, scientific discussions and writing of scientific text.

Recommended literature:
According to the field of diploma work.

Course language:

Course assessment
Total number of assessed students: 259

A	B	C	D	E	FX
95.37	2.7	1.16	0.39	0.0	0.39

Provides: doc. RNDr. Andrea Straková Fedorková, PhD., doc. RNDr. Mária Kožurková, CSc., doc. RNDr. Ján Imrich, CSc., prof. RNDr. Katarína Györyová, DrSc., prof. RNDr. Juraj Černák, DrSc., prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Jozef Gonda, DrSc., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Katarína Reiffová, PhD., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Mária Reháková, CSc., doc. RNDr. Miroslava Martinková, PhD., doc. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Vladimír Zeleňák, PhD., doc. RNDr. Ivan Potočňák, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Dušan Koščík, CSc., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Slávka Hamuľaková, PhD., RNDr. Ladislav Janovec, PhD., RNDr. Zuzana Kudličková, PhD., RNDr. Lívia Kocúrová, PhD., prof. Mgr. Vasiľ Andruch, DrSc., prof. Dr. Yaroslav Bazeľ, DrSc.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SEP1/15	**Course name:** Semestrálny projekt 1

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 6 **Per study period:** 84
Course method: present

Number of credits: 4

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Notification any thesis adversed by Department of Physical Chemistry. Semester experimental work with master degree thesis.

Learning outcomes:
Semester scientific thesis.

Brief outline of the course:
Experimental work in research field for master degree . Evaluation of results and verbal presentation and discussion about.

Recommended literature:
Recent journal references.

Course language:

Course assessment
Total number of assessed students: 28

abs	n
100.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Jozef Gonda, DrSc., RNDr. Monika Tvrdoňová, PhD., RNDr. Patrik Olekšák, RNDr. Kvetoslava Stanková, PhD., RNDr. Ján Elečko, PhD., doc. RNDr. Ján Imrich, CSc., RNDr. Mariana Budovská, PhD., RNDr. Martin Walko, PhD., RNDr. Ladislav Janovec, Ph.D., RNDr. Slávka Hamuľaková, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/SEP2/15	**Course name:** Semestrálny projekt 2

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 6 **Per study period:** 84
Course method: present

Number of credits: 6

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Notification any thesis adversed by Department of Physical Chemistry. Semester experimental work with master degree thesis.

Learning outcomes:
Semester scientific thesis.

Brief outline of the course:
Experimental work in research field for master degree . Evaluation of results and verbal presentation and discussion about.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 26

abs	n
100.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Jozef Gonda, DrSc., RNDr. Monika Tvrdoňová, PhD., RNDr. Kvetoslava Stanková, PhD., RNDr. Ján Elečko, PhD., RNDr. Mariana Budovská, PhD., RNDr. Martin Walko, PhD., RNDr. Slávka Hamuľaková, PhD., RNDr. Ladislav Janovec, Ph.D.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SKACH1/06	**Course name:** Forensic and Clinical Analytical Chemistry

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

Number of credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Examination.

Learning outcomes:
Application of analytical methods in forensic medicine.

Brief outline of the course:
Basic principles and definition of subject. Basic criminalistic categories. Criminalistic track. Criminalistic technology. Criminalistic methods, resources, procedures and operations. Introduction to forensic chemistry. Chemical, physical and physicochemical methods of research tracks and material evidence. Fingerprints. Forensic biology. Forensic toxicology.

Recommended literature:
1.A. Mozayani, C.Noziglia: The Forensic Laboratory Handbook. Procedures and Practice, Springer, 2006
2.H.Duffus, H.G.J.Worth: Fundamental Toxicology, Springer, 2006
3.R.Bertholf, R.Winecker: Chromatographic Methods in Clinical Chemistry and Toxicology, Wiley. 2007

Course language:

Course assessment
Total number of assessed students: 42

A	B	C	D	E	FX
52.38	33.33	14.29	0.0	0.0	0.0

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/SPVKE/07	**Course name:** Social-Psychological Training of Coping with Critical Life Situations
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 126	

abs	n	z
97.62	2.38	0.0

Provides: Mgr. Ondrej Kalina, PhD.
Date of last modification: 16.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/SVK1/00	**Course name:** Students Scientific Conference (Presentation)

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

Number of credits: 4

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 204

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

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ TA1/03	**Course name:** Thermal Analysis

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

Number of credits: 5

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

Course level: II., III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Goal of the course is to provide the students with a knowledge of experimental thermoanalytical techniques, the use of thermoanalytic methods for characterization of inorganic and organic compounds and reaction kinetics.

Brief outline of the course:
Introduction, experimental thermoanalytical techniques (thermogravimetric analysis, differential thermal analysis, thermomagnetic techniques, thermodilatometric analysis, high temperature reflectance spectroscopy). The use of thermoanalytic methods for characterization of inorganic and organic compounds, materials and pharmaceutical substances. Reaction kinetics.

Recommended literature:
Wendlandt, W. W.: Thermal Methods of Analysis, 2. vydanie, New York, 1985.
Schultze, D.: Differentialthermoanalyse, VEB Deutsch Verlag Wissenschaften, Berlin, 1969.
Heide, K.: Dynamische thermische Analysenmethoden, VEB Deutsch Verlag Wissenschaften, Leipzig, 1979.

Course language:

Course assessment
Total number of assessed students: 51

A	B	C	D	E	FX	N	P
45.1	23.53	13.73	1.96	1.96	0.0	0.0	13.73

Provides: doc. RNDr. Vladimír Zeleňák, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ TED/15	**Course name:** Teória elektrochemického deja

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

Number of credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Priebežný didaktický test z obsahu prednášok, záverečný písomný test-výpočet teoretických parametrov elektródových procesov.
EN
Partial test and final course test.
PA - Podmienky na absolvovanie predmetu
Partial test and final course test. Examination.

Learning outcomes:
Examination.

Brief outline of the course:
Equilibria on charged interfaces, classification of of electrochemical potentials. Electric double layer, electrocapillary phenomena, electric double layer capacity, adsorption on electrode/solution interface. Structure of charged interface: The Helmholtz model, The Gouy-Chapman model, The Stern model. Processes in heterogennous electrochemical systems - basic concepts and definitions. Reversibility of electrode reactions. Polarization curves and informations provided by them (charge transfer coefficient, heterogeneous rate constant, exchange current density). Activation overpotential - equation of polarization curve, Butler - Volmer equation. Influence of transport processes on electrode kinetics (convection, diffusion, migration). Diffusion overpotential. Theory of electrolytic deposition. Crystallization and nucleation overpotential. Experimental methods for electrochemical kinetics (single pulse and multipulse potentiostatic methods, cyclic voltammetry with dc and dp scan, coulometry, chronopotentiometry). Spectroelectrochemistry and its applications. QCM. (Membrane electrochemistry and bioelectrochemistry - possibility to extend lectures.)

Recommended literature:
J.O´M. Bockris, A.K.N. Reddy: Modern Electrochemistry, Macdonald, London 2002 A.J. Bard, L.R. Faulkner: Electrochemical Methods, Fundamentals and Applications, John Wiley and Sons, New York 1980 J. Koryta, J. Dvořák, L. Kavan: Principles of Electrochemistry, John Wiley & Sons, New York 1993 E. Scholz (Ed.): Electroanalytical Methods, Guide to Experiments and Applications, Springer Vrlg., Berlin 2002 T. Engel, P. Reid: Physical Chemistry, Pearson Educat. Inc., San Francisco 2006

Course language:

Course assessment
Total number of assessed students: 11

A	B	C	D	E	FX
81.82	18.18	0.0	0.0	0.0	0.0

Provides: prof. RNDr. Renáta Oriňaková, DrSc., doc. RNDr. Andrea Straková Fedorková, PhD., RNDr. Lenka Lorencová, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVa/11	**Course name:** Sports Activities I.

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

Number of credits: 2

Recommended semester/trimester of the course: 1.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 10457

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.25	0.0	0.0	0.0	0.0	0.02	7.81	3.92

Provides: Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., Mgr. Marcel Čurgali, doc. PhDr. Ivan Šulc, CSc.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 9779

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.09	0.61	0.02	0.0	0.0	0.02	10.36	3.9

Provides: Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., Mgr. Marcel Čurgali, doc. PhDr. Ivan Šulc, CSc.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 6188

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
89.66	0.03	0.0	0.0	0.0	0.0	4.36	5.95

Provides: PaedDr. Jana Potočníková, PhD., 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., Mgr. Aurel Zelko, PhD., doc. PhDr. Ivan Šulc, CSc.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of credits: 2

Recommended semester/trimester of the course: 4.

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

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 4644

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.66	0.32	0.04	0.0	0.0	0.0	6.61	7.36

Provides: Mgr. Marcel Čurgali, Mgr. Peter Bakalár, PhD., Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, Mgr. Zuzana Küchelová, PhD., PaedDr. Jana Potočníková, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Aurel Zelko, PhD., doc. PhDr. Ivan Šulc, CSc.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/UPR/03	**Course name:** The Art of Aiding by Verbal Exchange

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

Number of credits: 2

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 49

A	B	C	D	E	FX
85.71	4.08	2.04	2.04	2.04	4.08

Provides: Mgr. Ondrej Kalina, PhD.

Date of last modification: 16.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VSE1a/04	**Course name:** Special Seminar

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

Number of credits: 2

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Actual problems of physical and analytical chemistry which are connected with the solution of the students theses.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 44

A	B	C	D	E	FX
88.64	4.55	2.27	2.27	2.27	0.0

Provides: prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Katarína Reiffová, PhD., doc. RNDr. Taťána Gondová, CSc., doc. Ing. Viera Vojteková, PhD., prof. Mgr. Vasiľ Andruch, DrSc., doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Rastislav Serbin, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VSE1b/04	**Course name:** Special Seminar

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Actual problems of physical and analytical chemistry which are connected with the solution of the students theses.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 43

A	B	C	D	E	FX
90.7	2.33	4.65	2.33	0.0	0.0

Provides: prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Andrej Oriňak, PhD., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Katarína Reiffová, PhD., prof. RNDr. Renáta Oriňaková, DrSc., doc. RNDr. Taťána Gondová, CSc., prof. Mgr. Vasiľ Andruch, DrSc., RNDr. Andrea Morovská Turoňová, PhD., RNDr. Rastislav Serbin, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ ÚTVŠ/CM/13	**Course name:** Seaside Aerobic Exercise
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 36s **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Course assessment Total number of assessed students: 15	

abs	n
26.67	73.33

Provides: Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.
Date of last modification: 23.02.2017
Approved: Guaranteeprof. RNDr. Andrej Oriňak, PhD.