CONTENT

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
1. Attendance at lectures and seminars (this also applies to the online form of teaching)
2. Activity at seminars (also applies to the online form of teaching) - theoretical preparation of students for all seminars is required
3. Elaboration of written assignments (20% of the total evaluation) according to the teacher's instructions.
4. Passing the final test (30% of the total evaluation).
5. Exam (written 25% and oral part 25%).

Learning outcomes:
The aim of the course is to get acquainted with 1D and 2D NMR methods and the application of the acquired knowledge in solving NMR problems.

Brief outline of the course:
1. Advanced 1D NMR methods
a) 13C NMR experiments – APT, DEPT
b) NOE experiments
c) Selective experiments
2. 2D NMR methods
a) Proton-proton correlation through coupling – COSY, TOCSY
b) Proton-proton correlation through space - NOESY
c) Proton-carbon correlation – HSQC/HMQC/HETCOR, HMBC, H2BC, EXSIDE
d) Carbon-carbon correlation - INADEQUATE

Recommended literature:
1. H. Friebolin: Basic One- and Two-Dimensional NMR Spectrocopy, 5. Ed., Wiley, 2010.
2. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, 5. Ed., Elsevier, 2016.
3. Atta-ur-Rahman, M. I. Choudhary: Solving Problems with NMR spectroscopy, Academic Press 1996.

Course language:
english

Notes:
Teaching is carried out in person or, if necessary, online using the MS Teams or BBB (BigBlueButton) tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 196

A	B	C	D	E	FX
41.33	25.0	23.47	8.67	1.53	0.0

Provides: doc. RNDr. Mária Vilková, PhD.

Date of last modification: 28.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/APO1/02	**Course name:** Analysis of Psychotropic and Narcotic Substances

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Examination

Learning outcomes:
Survey of classification, effects/mechanism and properties of psychotropic and narcotic substances, drug dependences and methods used in the (toxicological) analysis of drugs.

Brief outline of the course:
Drug, drug dependence. Psychotropic and narcotic substances - classification, properties and laws. Dose and tolerance, therapy, prevention. Pharmacokinetics of the drug. Biological effects, biotransformations, receptors. The methods used in the analysis of the drugs (clinical, forensic analysis) - opiates, cocaine, amphetamines and their analogues, hallucinogenics, cannabis products, etc.

Recommended literature:
1. M. D. Cole: The Analysis of Controlled Substances, Wiley 2003.
2. E. Hodgson: A Textbook of Modern Toxicology, Wiley 2004.

Course language:

Notes:

Course assessment
Total number of assessed students: 266

A	B	C	D	E	FX
94.36	3.76	1.5	0.38	0.0	0.0

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 15.11.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ANAL/18	**Course name:** Analysis of drugs

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Assessment, based on 3 prepared presentations on specified topics (3x10 points), a minimum of 20 points is required for completion.

Learning outcomes:
Survey of basic principles, methods and new trends in drugs analysis.

Brief outline of the course:
Analysis of chemical drugs, control and evaluation of drug quality, Slovak and European Pharmacopoeia.
Determination of drug content, classical methods of determination - proof reactions of ions, etc. Solid state drug analysis, impurity analysis, drug degradation, stability study. Sample preparation, cleaning and extraction procedures. Methods used in drug analysis, optical and separation methods. Validation of analytical methods

Recommended literature:
Ahuja S., Scypinski S., eds.: Handbook of Modern Pharmaceutical Analysis, Separation Science and Technology, Vol.3, Academic Press, 2001.
European Pharmacopoeia, 10th, online.pheur.org/EN/entry.html

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 53

abs	n
100.0	0.0

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 15.11.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ ACHSP/15	**Course name:** Analytical Chemistry
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course: Sampling and processing in analytical chemistry, basic rules of sampling. Representative sample, homogeneous sample. Sample pretreatment, selection of analytical method. Types of chemical equilibria in solutions. Protolytic equilibria. Oxidation-reduction equilibria. Precipitation equilibria. Complex-forming equilibria. Use of analytical reaction in quantitative analysis. Methods of suppressing adverse reactions. Masking in analytical chemistry. Basic principles and classification of separation methods. Extraction, principle, classification of extraction methods and their use in sample preparation - LLE, SPE, SPME, etc. Basic principles of chromatography, general description of chromatographic process. Qualitative and quantitative analysis in chromatography. Principles of chromatographic separation in gas chromatography (GC). Theoretical bases of liquid chromatography (LC). Gel permeation chromatography (GPC), ion exchange chromatography (IEC), supercritical fluid chromatography (SCF), principles and applications. UPLC versus HPLC. Electromigration methods, principle, classification and their use. Principles of the most important instrumental analytical methods. Electrochemical analytical methods, typical applications. Voltammetric methods, potentiometric methods, coulometry. Electrochemical dissolution analysis. Electrochemical detectors in flow systems. Spectral analytical methods. Atomic and molecular spectroscopy: Principles, division. Atomic spectra, origin, analytical use. Basic differences in emission and absorption methods. Excitation sources. Radiation decomposition. Radiation detection. Matrix effects and their elimination. Implementation of analytical calibration. Atomic absorption spectrometry. Molecular spectrophotometry - UV/VIS, IR, MS. Thermal analysis. Fundamentals of mathematical and statistical methods used in analytical chemistry. Probability distribution of measurement results, classical and robust estimates of mean and variance. Statistical tests and their application. Accuracy, precision, and reliability of results. Calibration in analytical chemistry, linear and nonlinear models.	
Recommended literature: 1. Christian G.D.: Analytical Chemistry. John Wiley & Sons, Inc. New York – Chichester – Brisbane – Toronto – Singapore 2004.	

2. Harvey D.: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.
3. Harvey D.: Analytical Chemistry 2.1. LibreText. 2021.
4. Labuda J. a kol.: Analytická chémia. Vydavateľstvo STU. Bratislava 2019.
5. R. G. Brereton: Chemometrics., Wiley, Chichester, 2003.
6. M. Meloun, J. Militký: Kompendium statistického zpracování dat., Academia, Praha 2006.

Course language:
Slovak

Notes:
The course is implemented by full-time or distance method (MS Team, Google Meet, BBB) or a combined method.

Course assessment
Total number of assessed students: 78

A	B	C	D	E	FX
53.85	25.64	16.67	3.85	0.0	0.0

Provides:

Date of last modification: 20.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ANCH2/06	**Course name:** Analytical 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 ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in seminars.
Test.

Learning outcomes:
Advanced knowledge of modern analytical chemistry.

Brief outline of the course:
Analytical chemistry. Objects of analysis. Instrumental equipment of a modern analytical laboratory. Relationship between analytical chemistry and other scientific branches. Problems and trends in recent analytical chemistry. Speed and factors affecting the speed of analysis. Validation of analytical methods. Non-destructive methods of analysis, principle, utility. Distance analysis. Automation of analysis, examples. Flow analysis – FIA and SIA. Analytical reaction, chemical equilibrium in solutions. Kinetic analytical methods. Radiochemical analytical methods. Secondary Ion Mass Spectrometry. X-ray Photoelectron spectrometry. Mass pectrometry. Roentgen spectroscopic methods.

Recommended literature:
1. Willard H.H., Merritt L.L., Dean J.A., Settle F.A.: Instrumental Methods of Analysis, Wadsworth Publ. Co., Belmont (CA) 1988.
2. Christian G.D.: Analytical Chemistry. John Wiley & Sons, Inc. New York – Chichester – Brisbane – Toronto – Singapore 2004.
3. Harvey D.: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.
4. Harvey D.: Analytical Chemistry 2.1. LibreText. 2021.
5. Labuda J. a kol.: Analytická chémia. Vydavateľstvo STU. Bratislava 2019.
6. Current journal literature.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method (using the tools of MS Team, Google Meet, BBB) or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 124

A	B	C	D	E	FX
42.74	36.29	16.94	0.81	2.42	0.81

Provides: prof. Mgr. Vasiľ Andruch, DSc., prof. Dr. Andrii Vyshnikin, DrSc.

Date of last modification: 25.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ AAS1/03	**Course name:** Atomic Spectrochemistry

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Based on the ongoing evaluation: it means based on the results of laboratory exercises and seminar works with an assessment higher than 51%.
Based on ongoing evaluation, and the final written and oral examination. The exam consists of a written and an oral part and its overall percentage rating must be higher than 51%. (Written and oral exam evaluation: 51-60% - E; 61-70% - D; 71-80% - C; 81-90% - B; 91-100% - A).

Learning outcomes:
After completing the subject, the student will acquire theoretical information and practical experience in the field of spectro-analytical methods.

Brief outline of the course:
Information and the role of atomic absorption and emission spectroscopy in analytical chemistry. History of the development of spectral methods.
Theoretical foundations, principles and classification of optical methods. Experimental foundations of spectral methods. Atomic absorption spectrometry. Atomic emission spectrometry.
Atomic fluorescence spectrometry. X-ray spectrometry. Inorganic mass spectrometry. Molecular absorption spectrometry in the visible, ultraviolet and near-infrared region and its analytical applications.

Recommended literature:
I.Němcová, L. Čermáková, P. Rychlovský: Spektrometrické analytické metódy. Karolinum , Praha, 1997.
D. A. Skoog, J. J. Leary: Instrumental Analytics. Springer, Berlin, 1996.
B. Welz, M. Sperling: Atomic Absorption Spectrometry,Wiley-VCH, Weinheim, 1998.
H. Günzler, A. Wiliams: Handbook of Analytical Techniques. Wiley-VCH, Weinheim, 2001.
G. Gauglitz, T. Vo-Dinh: Handbook of Spectroscopy. Wiley-VCH, Weinheim, 2003.

Course language:
Slovak language

Notes:

Theoretical part of the course can also be carried out by distance learning, using MS Teams or BBB. The form of teaching is always specified at the beginning of the semester, and is continuously updated in accordance with the pandemic situation.

Course assessment

Total number of assessed students: 128

A	B	C	D	E	FX
46.88	23.44	17.19	9.38	3.13	0.0

Provides: doc. Ing. Viera Vojteková, PhD.

Date of last modification: 05.08.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ ZEM/21	**Course name:** Basics of electroanalytical 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 ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises and seminars; successful completion of the tests.
1. Participation in laboratory exercises is required. Assigned teacher who leads exercises justifying the student's absence (incapacity for work, family reasons, etc.) for a maximum of two exercises during the semester without substitute supplying. The assigned teacher, who leads the seminar, assesses the preparation of students and their activity in seminars. The student is obliged to prepare a protocol from each laboratory exercise resp. assignment determined by the teacher. Written test.
2. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam.
3. Successful completion of the final written test.
The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester (50%) with an examination during the examination period (50%). To complete the course it will be necessary to achieve at least 51% of the total evaluation.
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
Getting information about the electroanalytical methods and application in laboratory practice.

Brief outline of the course:
Principle of electroanalytical methods. Electrodes. Potentiometry. Voltammetry. Polarography. Linear and cyclic voltammetry. Pulse voltammetry. Stripping voltammetry. Voltammetric titrations. Amperometry and titrations with polarizable electrodes. Coulometry. Potentiostatic coulometry. Coulometric titrations. Conductometry. Chronopotentiometry.
Electroanalytical measurements in flow systems. Miniaturization of electrochemical analytical methods. Selected applications of electroanalytical methods as quality control in the analysis of technological products, in bioanalytical applications, analysis of foreign substances in the environment, in diagnostic and clinical analysis, in forensic science, etc.

Recommended literature:
1. J. Labuda a kol. Analytická chémia, STU, Bratislava 2014.

2. Allen J. Bard, Cynthia G. Zoski. Electroanalytical Chemistry. A Series of Advances: Volume 26. Taylor&Francis, 2015.
3. D. Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 17

A	B	C	D	E	FX
88.24	11.76	0.0	0.0	0.0	0.0

Provides: RNDr. Jana Šandrejová, PhD., univerzitná docentka

Date of last modification: 15.11.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ BACH1/03	**Course name:** Bioanalytical 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 ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Completion of block exercises. Processing and presentation of the assigned topic. Oral examination.

Learning outcomes:
Theoretical knowledge and practical experience regarding application of analytical chemistry and analytical methods to laboratory medicine.

Brief outline of the course:
Introduction to Bioanalytical Chemistry, biological samples classification. Factors affecting analytes in biological samples. Collection, transport and storage of biological samples. Selected procedures of sample pretreatment Control and management of quality in clinical laboratory. Enzymes in bioanalysis. Introduction to Immunochemical methods - basic characteristics of the immune system, antibody, antigen, hapten - definition, basic characteristics. Precipitation and Agglutination methods - principle, definition, use. Immunodiffusional methods. Radioimmunoanalytic methods (RIA). Nonisotopic methods (EIA, ELISA, LIA, FIA). Investigative procedures in medical microbiology. Principles miniaturization of analytical procedures in clinical chemistry, microchips, nanochips, sensors and biosensors.

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:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously

Course assessment Total number of assessed students: 138					
A	B	C	D	E	FX
35.51	36.96	18.12	8.7	0.72	0.0
Provides: doc. RNDr. Katarína Reiffová, PhD.					
Date of last modification: 25.01.2022					
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ ACM1/06	**Course name:** Chemometrics

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
On the basis of ongoing evaluation, which requires the elaboration of homeworks and seminar works, and a final written project with an assessment higher than 51%.
On the basis of ongoing evaluation, and final examination. The exam consists of a written and an oral part and its overall percentage rating must be higher than 51%. (Written and oral exam evaluation: 51-60% - E; 61-70% - D; 71-80% - C; 81-90% - B; 91-100% - A).

Learning outcomes:
After completing the course, the student will acquire knowledge about the correct and theoretically based evaluation of analytical results and methods.
Knowledge about the methods of validation and accreditation of laboratories.
Knowledge about the result uncertainties, methods of decision statistics and good laboratory practice.

Brief outline of the course:
The principles of the mathematic- statistical methods used in analytical chemistry. Probability distribution of the measuring results. Classic and robust estimation of the mean value and variance. Statistical tests and their application. Accuracy, precision, and reliability of the results. Uncertainity of the results. Calibration in the analytical chemistry, linear and nonlinear models.
Evaluation of the analytical methods, the chosen optimization approaches. Solving of the typical examples in the frame of the practical lectures.

Recommended literature:
R. G. Brereton: Chemometrics., Wiley, Chichester, 2003
M. Meloun, J. Militký: Kompendium statistického zpracování dat., Academia, Praha 2006
James N. Miller, Jane C. Miller: Statistics and Chemometrics for Analytical Chemistry, Pearson Education Limited, England, 2010

Course language:
Slovak language

Notes:

The course can be carried out by distance learning, using MS Teams or BBB. The form of teaching is always specified at the beginning of the semester, and is continuously updated in accordance with the pandemic situation.

Course assessment

Total number of assessed students: 126

A	B	C	D	E	FX
43.65	26.98	20.63	4.76	3.97	0.0

Provides: doc. Ing. Viera Vojteková, PhD.

Date of last modification: 05.08.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/RP/14	**Course name:** Class Project

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Submission of a year project based on the assignment of the teacher.
Its content is experimental laboratory work on a topic assigned by the teacher and evaluation of the obtained experimental results. The condition for successful completion is realization of the assigned experiments and their evaluation in the form of presentation. After the implementation of experiments, successful presentation of results and answering any comments, the teacher will give the evaluation "completed".

Learning outcomes:
Mastering of individual work in the laboratory and creative processing of the assigned topic, according to available literature.

Brief outline of the course:

Recommended literature:
According to the recommendations of project supervisors.
Current journal literature.

Course language:
Slovak, english.

Notes:

Course assessment
Total number of assessed students: 259

abs	n
99.23	0.77

Provides: doc. RNDr. Miroslav Almáši, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD., prof. RNDr. Vladimír Zeleňák, DrSc., doc. RNDr. Ivan Potočňák, PhD., prof. Dr. Yaroslav Bazeľ, DrSc., prof. Mgr. Vasiľ Andruch, DSc., doc. RNDr. Katarína Reiffová, PhD., doc. RNDr. Taťána Gondová, CSc., doc. Ing. Viera Vojteková, PhD., RNDr. Rastislav Serbin, PhD., RNDr. Jana

Šandrejová, PhD., univerzitná docentka, Mgr. Michaela Rendošová, PhD., Mgr. Nikolas Király, PhD., prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD.
Date of last modification: 25.01.2022
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ DPO/22	**Course name:** Diploma Thesis and its Defence

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

Number of ECTS credits: 16

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 56

A	B	C	D	E	FX
73.21	17.86	7.14	1.79	0.0	0.0

Provides:

Date of last modification: 14.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Written control test. Written 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), Micellar electrokinetic chromatography (MEKC).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. Electrophoresis of nucleic acid, Elektrophoresis of serum proteins

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:
Slovak

Notes:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX
54.55	45.45	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 25.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ AZP1/04	**Course name:** Environmental Analytical Chemistry

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

Number of ECTS credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises and seminars; successful completion of the final test. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam. The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester (50%) with an examination during the examination period (50%).
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
The student acquires knowledge of the methods of environmental analysis.

Brief outline of the course:
Components of the environment: hydrosphere, lithosphere, atmosphere. Analytical methods used in the analysis of environmental samples. Choice of analytical method. Advantages and disadvantages of field methods. Sampling and sample preparation in environmental analysis. Chemical treatment of solid samples. Quality assurance system in environmental analysis laboratories. Good laboratory practice and accreditation of analytical laboratories. Analysis of water, soil, ores, sediments, air and food. Use of spectral, separation and electrochemical methods in environmental analysis. Automatic monitoring. Environmental monitoring.

Recommended literature:
1. Tölgyessy J. a kol. Chémia, biológia a toxikológia vody a ovzdušia. Bratislava, VEDA, 1984.
2. A.M. Ure, C.M. Davidson, Chemical Speciation in the Environment. Blackie, London 1995.
3. J.R. Dean, Extraction Methods for Environmental Analysis. Wiley, 1988.
4. H.D. Belitz, W. Grosch, P. Schieberle, Food Chemistry, Springer Verlag, 2004.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment Total number of assessed students: 276					
A	B	C	D	E	FX
46.01	18.48	18.12	6.52	10.87	0.0
Provides: prof. Mgr. Vasil' Andruch, DSc.					
Date of last modification: 22.07.2022					
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.					

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 ECTS credits: 6

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
The supervisor of the diploma thesis evaluates the student's experimental work individually every week and at the end of the semester.

Learning outcomes:
Acquisition of experimental methods necessary for the successful solution of the diploma thesis.

Brief outline of the course:
Technique of experimental methods, including the use of devices needed to solve the thesis. The use of experimental instrumentation techniques in the elaboration of a diploma thesis, focusing on work with spectral and chromatographic methods used in the characterization of the structure of synthesized organic compounds. Practical application of these methods.

Recommended literature:
Current journal literature. Chemical online databases.

Course language:
Slovak, english

Notes:
Teaching is carried out full-time or part-time, using the BBB platform (BigBlueButton) or MS Teams. The form of teaching is specified by the teacher at the beginning of the semester and continuously updated.

Course assessment
Total number of assessed students: 456

A	B	C	D	E	FX
94.52	3.29	1.1	0.44	0.66	0.0

Provides: prof. RNDr. Mária Kožurková, CSc., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, prof. RNDr. Erik Sedlák, DrSc., doc. RNDr. Viktor Víglaský, PhD., doc. RNDr. Katarína Reiffová, PhD., RNDr. Nataša Tomášková, PhD., doc. RNDr. Slávka Hamuľaková, PhD., doc. RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, prof. Mgr. Vasiľ Andruch, DSc., prof. Dr. Yaroslav Bazeľ,

DrSc., doc. RNDr. Ladislav Janovec, PhD., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Mariana Budovská, PhD., doc. RNDr. Mária Vilková, PhD., RNDr. Monika Tvrdoňová, PhD., RNDr. Ján Elečko, PhD., RNDr. Jana Špaková Raschmanová, PhD., RNDr. Zuzana Kudličková, PhD., RNDr. Rastislav Serbin, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc., RNDr. Kvetoslava Stanková, PhD., Serhii Zaruba, PhD., RNDr. Martin Fábian, PhD.
Date of last modification: 25.01.2022
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 5

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Elaboration and presentation of a seminar work with an assigned topic. Written examination.

Learning outcomes:
Application of analytical methods in criminology and forensic medicine.

Brief outline of the course:
Criminology section: 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. Dactyloscopy. Methods of individual identification of persons.
Toxicological part: definition, classification and role of toxicology. Separation methods used in toxicology. Definition of poison. Pharmacokinetics and metabolism. Absorption, distribution, metabolism and elimination. Nox accumulation in the body. Biotransformation of noxy, biotransformation reactions. Poisoning, overdose, toxic levels, nox interaction. General approaches to the treatment of acute poisoning. Laboratory diagnostics of poisoning, drug abuse, sample selection, detection limits and time detection window. Development trends in toxicology - current toxicological methods - advantages and limitations.

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:

Notes:

Course assessment Total number of assessed students: 82					
A	B	C	D	E	FX
64.63	24.39	10.98	0.0	0.0	0.0
Provides: doc. RNDr. Katarína Reiffová, PhD.					
Date of last modification: 08.09.2021					
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ GAC/18	**Course name:** Green analytical chemistry: miniaturization, automation, sensors

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises or online seminars; elaboration of the subject project; successful completion of the final test. Written test and oral examination during the examination period.
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
Getting information about the green chemistry, miniaturization, and automation in analytical chemistry.

Brief outline of the course:

Recommended literature:
1. Labuda a kol. Analytická chémia. ISBN: 9788022742429, Vydavateľstvo: STU Bratislava, Rok
vydania: 2014, Počet strán: 671
2. Current periodical literature.
3. ANASTAS, P., WARNER J. C. Green Chemistry: Theory and Practice. Oxford: Oxford University Press. 1998.
4. KOLEV S.D., McKELVIE I.D. Advences in flow injection analysis and related techniqoues. Elsevier Wilson&Wilson's, USA, 2008.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX
75.0	16.67	8.33	0.0	0.0	0.0

Provides: RNDr. Jana Šandrejová, PhD., univerzitná docentka

Date of last modification: 11.11.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHHS/07	**Course name:** Hydrochemistry

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

Number of ECTS credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises and seminars; successful completion of the final test. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam. The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester (50%) with an examination during the examination period (50%).
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
The student acquires knowledge of the hydrochemistry.

Brief outline of the course:
European Water Charter. Water consumption. Water supplies. Water cycle in nature. Basics of water chemistry. Water sampling methods. Water analysis strategy. Methods of chemical analysis of water. Test method in water analysis. Automatic monitoring stations and sensors. Physical properties of water. Classification of substances present in natural waters. Types of natural waters and their characteristics. Water quality monitoring in Slovakia. Surface waters, their classification, chemical composition and properties. Pollution and analysis of surface waters. Sediments, their composition and analysis. Mutual influence of waters and sediments. Groundwater, their classification, chemical composition and properties. Groundwater pollution and analysis. Drinking water. Drinking water quality requirements. Physical, sensory and chemical indicators of drinking water quality. Analytical methods used in the analysis of drinking water. Domestic hot water preparation and requirements for its quality. Mineral waters, their classification, chemical composition, properties and analysis. Wastewater, their classification, chemical composition, properties and analysis. Sea water.

Recommended literature:
1. Tölgyessy J. a kol. Chémia, biológia a toxikológia vody a ovzdušia. Bratislava, VEDA, 1984.
2. Kalavská D., Holoubek I. Analýza vôd. Bratislava, Alfa, 1989. 262 s.
3. Handbook of Water and Wastewater Treatment Technologies. Ed. By Nicholas P Cheremisinoff, Butterworth Heinemann, 2001. 576 p.

4. Principles of Water Quality Control, Ed. by Thy Tebbutt, Butterworth Heinemann, 1997. 288 p.
5. Water Technology. Ed. by N. F. Gray, Butterworth Heinemann, 2005. 600 p.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 152

A	B	C	D	E	FX
34.21	18.42	17.11	15.13	15.13	0.0

Provides: prof. Mgr. Vasil' Andruch, DSc.

Date of last modification: 22.07.2022

Approved: prof. Dr. Yaroslav Bazel', DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ KCHR/06	**Course name:** Liquid Chromatography

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Examination.
PPT presentation of selected modern LC techniques.

Learning outcomes:
Advanced knowledges about new LC methods and applications

Brief outline of the course:
Theoretical principles of liquid chromatography. Selection and optimisation of separation process. Sample pretreatment. New trends in HPLC techniques - uLC, chiral analysis, multidimensional chromatography, combined systems with LC. Applications.

Recommended literature:
Skoog D.A.: Principles of Instrumental Analysis. Saunders, New York 1985.
Mondello L., Lewis A.C., Bartle K.D.: Multidimensional Chromatography, Wiley, 2002.

Course language:

Notes:

Course assessment
Total number of assessed students: 85

A	B	C	D	E	FX
62.35	27.06	9.41	1.18	0.0	0.0

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 04.08.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/FMPV/22	**Course name:** Methodology of Science 1

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 ECTS credits: 2

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Attendance: A student may have one unexcused absence in seminar at the most. Absence in more than one seminar must be reasoned and substituted by consultations. Conditions of continuous and final control: during the semester a student is continuously checked and assessed according to his/her activity. To be awarded the credits, a student must pass a test from knowledge obtained in the lectures and seminars. Results of the test will make up the final grade.

Learning outcomes:
The course is aimed at getting familiar with the basic issues of methodology and philosophy of science. Significant part will be devoted to presenting the main concepts of the philosophy of science in the 20th century and this aim will be achieved by reading the source and interpretive texts.

Brief outline of the course:
• Falsificationism and critical realism by K. R. Popper.
• Development and critique of the Popper's concept.
• Understanding the science development in the work by T. S. Kuhn.
• Methodology of scientific research programmes of I. Lakatos.
• Methodological anarchism of P. Feyerabend.
• W.V.O. Quine – the issue of relation between theory and empiricism.

Recommended literature:
BILASOVÁ, V. – ANDREANSKÝ, E.: Epistemológia a metodológia vedy. Prešov: FF PU 2007.
FAJKUS, B.: Filosofie a metodologie vědy. Praha: Academia 2005.
BEDNÁRIKOVÁ, M. Úvod do metodológie vied. Trnavská univerzita: Trnava 2013.
DÉMUTH, A. Filozofické aspekty dejín vedy. Trnavská univerzita: Trnava 2013.
FEYERABEND, P.: Proti metodě. Prel. J. Fiala. Praha: Aurora 2001.
KUHN, T. S.: Štruktúra vedeckých revolúcií. Prel. Ľ. Valentová. Bratislava 1982.

Course language:
Slovak

Notes:

Course assessment Total number of assessed students: 10					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
Provides: prof. PhDr. Eugen Andreanský, PhD.					
Date of last modification: 01.02.2022					
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ MOL/06	**Course name:** Molecular 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 ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises and seminars; successful completion of the tests.
1. Participation in laboratory exercises is required. Assigned teacher who leads exercises justifying the student's absence (incapacity for work, family reasons, etc.) for a maximum of two exercises during the semester without substitute supllying. The assigned teacher, who leads the seminar, assesses the preparation of students and their activity in seminars. The student is obliged to prepare a protocol from each laboratory exercise resp. assignment determined by the teacher. Written test.
2. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam.
3. Successful completion of the final written test.
The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester with an examination during the examination period. To complete the course it will be necessary to achieve at least 51% of the total evaluation.
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
Advanced theoretical and practical knowledge of the modern methods of molecular spectroscopy.

Brief outline of the course:
Molekular spectrophotometry (Ultra-Violet, Visible, Infrared) for Chemical Analysis. Fourier Transform Infrared. Raman spectrometry. Microwave spectrometry. Electron Paramegnetic Resonance. Nuclear Magnetic Resonance.

Recommended literature:
1. L.Koller. Analytická chémia. TU Košice 2002.
2. S.Miertuš a kol. Atómová a molekulová spektroskopia. Alfa. Bratislava. 1991.
3. E.D.Olsen. Modern optical methods of analysis. McGraw-Hill, Inc. 1975.
4. A.Skoog, J.J.Leary. Instrumentelle Analytic. Springer. Berlin-Heidelberg. 1996.
5. Jie Shen, Tao Tang, Li-Lian Wang. Spectral Methods.Springer. Berlin-Heidelberg. 2013.
6. Aktuálna časopisecká literatúra.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 86

A	B	C	D	E	FX
54.65	26.74	15.12	3.49	0.0	0.0

Provides: RNDr. Rastislav Serbin, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc.

Date of last modification: 20.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KF/ FILA/22	**Course name:** Philosophical Antropology
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 8

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

Provides: doc. PhDr. Kristína Bosáková, PhD.
Date of last modification: 01.02.2022
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ FCHPB/26	**Course name:** Physico-Chemical Processes in Biomedicine

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam. Oral examination, or in the case of restrictions on in-person teaching, the exam will be conducted in an appropriate distance-learning (electronic) form. To successfully complete the course, students must demonstrate knowledge of the required material at a minimum level of 51%.

Learning outcomes:
The aim of the course is to familiarize students with physico-chemical principles in biological systems that determine the behavior of biomaterials, drugs, and diagnostic systems in biological and medical environments. Students will gain the ability to apply these principles in the analysis and design of modern biomedical technologies, such as implants.

Brief outline of the course:
1. Introduction to the course. Definition and interdisciplinary nature of the field. Connection between physical chemistry, biology, and medicine.
2. Thermodynamics in biological systems I. Energy flow and transformations in living organisms. Work associated with metabolic processes. Thermal changes associated with metabolic processes. Internal energy and enthalpy in biological systems. Thermal denaturation. Thermochemical properties of biological energy fuels (carbohydrates, fats, proteins).
3. Thermodynamics in biological systems II. Entropy in biological systems. Gibbs free energy in biological systems (proteins, biological membranes).
4. Thermodynamics in biological systems III. Phase transitions in macromolecules and biological membranes, stability. Colligative properties in biological systems. Osmosis and diffusion.
5. Thermodynamics in biological systems IV. Chemical equilibria in biological systems. Reaction Gibbs free energy. Catalytic reactions in biological systems. Effect of temperature on biochemical reactions. Electron transfer in biological systems. Ion transport across biological membranes. Kinetics of processes in biological systems. Reaction mechanisms and dynamics.
6. Physical chemistry of biomaterials. Definition and classification of biomaterials. Interaction of biomaterial surfaces with cells and proteins. Kinetics of processes on biomaterial surfaces. Methods for biomaterial characterization.
7. Biodegradation. Hydrolytic vs. enzymatic degradation. Corrosion in a biological environment. Effect of pH and temperature. Effect of body fluids. Ion release and toxicological aspects, biocompatibility.

8. Electrochemistry in biological and medical systems. Biomembranes as electrochemical interfaces. Implantable devices. Flexible and soft electrodes. Electrochemical methods in imaging and therapy.
9. Polymers and drug carriers. Hydrogels, biodegradable polymers. Controlled drug release and diffusion kinetics. Thermodynamics and kinetics of drug–tissue interactions. Drug solubility and transport. Targeted drug delivery. pH- and temperature-responsive systems.
10. Imaging methods. MRI (magnetic resonance imaging), CT (computed tomography), PET (positron emission tomography), electrical impedance tomography (EIT), fluorescence imaging. Electrochemotherapy (ECT). Physico-chemical principles of contrast agents. Nanomaterials as contrast and diagnostic agents.

Recommended literature:

Physical Chemistry for the Life Sciences. Peter Atkins et al. ISBN: 9780198830108.
Electron Transfer in Inorganic, Organic, and Biological Systems. James R. Bolton et al. ISBN: 9780841218468.
Biomateriály na báze fosforečnanov vápenatých. Ľubomír Medvecký a kol. ISBN: 9788022420686.
Základy elektrochemickej korózie kovov. Branislav Hadzima Tatiana Liptáková. ISBN: 9788080708764.
Zobrazovací metody pro radiologické asistenty. Jaroslav Vomáčka. ISBN: 9788024462042.
Hydrogels for biomedical applications. Allan S. Hoffman. DOI: 10.1016/j.addr.2012.09.010

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 0

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

Provides: RNDr. Radka Gorejová, PhD., prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 26.02.2026

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS 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:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously

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: 25.01.2022
Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ AVZ1/02	**Course name:** Sampling of Analytical Samples

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Oral examination. Sampling of real sample. Sucsesfull exam is by 40% of right answer.

Learning outcomes:

Brief outline of the course:
Sample, characterisation. Sampling and norms effecting sampling process. Quantity, number of samples. Sampling techniques. Sampling laboratory equipment. Sampling techniques. Sample pre-concentration. Sample storing and conservation. Matrix simplifying, specific analysis. Chromatographic sample pre-treatment.

Recommended literature:
O. Stoeppler: Sampling and Sample Preparation Practical Guide for Analytical Chemists. Academic Press, London, 2002.
E. P. Popek: Sampling and Analysis of Environmental Chemical Pollutants. Elsevier Science, San Diego, 2003.

Course language:

Notes:

Course assessment
Total number of assessed students: 212

A	B	C	D	E	FX
62.26	19.81	13.21	3.77	0.94	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD.

Date of last modification: 24.11.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ CM/13	**Course name:** Seaside Aerobic Exercise

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II., P

Prerequisities:

Conditions for course completion:
Completion: passed
Condition for successful course completion:
- active participation in line with the study rule of procedure and course guidelines
- effective performance of all tasks- aerobics, water exercise, yoga, Pilates and others

Learning outcomes:
Content standard:
The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature.
Performance standard:
Upon completion of the course students are able to meet the performance standard and:
- perform basic aerobics steps and basics of health exercises,
- conduct verbal and non-verbal communication with clients during exercise,
- organise and manage the process of physical recreation in leisure time

Brief outline of the course:
Brief outline of the course:
1. Basic aerobics – low impact aerobics, high impact aerobics, basic steps and cuing
2. Basics of aqua fitness
3. Basics of Pilates
4. Health exercises
5. Bodyweight exercises
6. Swimming
7. Relaxing yoga exercises
8. Power yoga
9. Yoga relaxation
10. Final assessment

Students can engage in different sport activities offered by the sea resort – swimming, rafting, volleyball, football, table tennis, tennis and other water sports in particular.

Recommended literature:
1. BUZKOVÁ, K. 2006. Fitness jóga. Praha: Grada. 167 s.

2. ČECHOVSKÁ, I., MILEROVÁ, H., NOVOTNÁ, V. Aqua-fitness. Praha: Grada. 136 s.
3. EVANS, M ., HUDSON, J., TUCKER, P. 2001. Umění harmonie: meditace, jóga, tai-či, strečink. 192 s.
4. JARKOVSKÁ, H., JARKOVSKÁ, M. 2005. Posilováni s vlastním tělem 417 krát jinak. Praha: Grada. 209 s.
5. KOVAŘÍKOVÁ, K. 2017. Aerobik a fitness. Karolium, 130 s.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 82

abs	n
7.32	92.68

Provides: Mgr. Agata Dorota Horbacz, PhD.

Date of last modification: 29.03.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ FIVYC/22	**Course name:** Selected Topics in Philosophy of Education (General Introduction)

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 ECTS credits: 2

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 2

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

Provides: PhDr. Dušan Hruška, PhD.

Date of last modification: 27.04.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VKAC/19	**Course name:** Selected chapters of 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 ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in seminars; successful completion of the final test. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam. The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester (50%) with an examination during the examination period (50%).
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
The student will expand the knowledge acquired in the field of analytical chemistry during bachelor's studies.

Brief outline of the course:

Recommended literature:
1. Current scientific literature.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 16

A	B	C	D	E	FX
56.25	18.75	25.0	0.0	0.0	0.0

Provides: prof. Mgr. Vasiľ Andruch, DSc.

Date of last modification: 22.07.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SP1/14	**Course name:** Semestral Project I
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course: 1.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Elaboration and submission of a semester project based on the assignment of the teacher. Its content is an independent search of scientific information in scientometric databases, subsequent study of original papers, its processing and presentation of the results of literare search. After a successful presentation and answering any comments, the teacher will give the evaluation "completed".	
Learning outcomes: Mastering the independent and creative processing of the assigned topic using the latest scientific literature.	
Brief outline of the course: WoS and Scopus scientific databases, resp. other, by the teacher suggested, accessible databases. Ways to search these databases. Specific search accodring to the assignement of the teacher. Selection of obtained results. Finding relevant original articles. Study of selected papers. Processing of obtained information into presentation. Presentation of the results.	
Recommended literature: WoS and Scopus scientific databases, Science direct and other accessible websites of scientific literature publishers. Current scientific papers.	
Course language: Slovak, English.	
Notes:	

Course assessment
Total number of assessed students: 268

abs	n
99.63	0.37

Provides: RNDr. Rastislav Serbin, PhD., prof. RNDr. Mária Kožurková, CSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Ján Imrich, CSc., doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, prof. RNDr. Erik Sedlák, DrSc., RNDr. Nataša Tomášková, PhD., doc. RNDr. Viktor Víglaský, PhD., doc. RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, RNDr. Jana Šandrejová, PhD., univerzitná docentka, doc. RNDr. Ivan Potočňák, PhD., RNDr. Marián Fabián, CSc., doc. RNDr. Miroslav Almáši, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD., prof. RNDr. Vladimír Zeleňák, DrSc., Mgr. Michaela Rendošová, PhD., Mgr. Nikolas Király, PhD., prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD., prof. Mgr. Vasiľ Andruch, DSc., doc. RNDr. Katarína Reiffová, PhD., doc. Ing. Viera Vojteková, PhD.

Date of last modification: 24.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SPII/14	**Course name:** Semestral Project II

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Semestral project.

Learning outcomes:
Work in the laboratory and creative processing of the assigned topic.

Brief outline of the course:

Recommended literature:
According to the recommendations of project supervisors.
Current journal literature.

Course language:

Notes:

Course assessment
Total number of assessed students: 86

abs	n
100.0	0.0

Provides: prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., doc. Ing. Viera Vojteková, PhD., prof. Mgr. Vasiľ Andruch, DSc., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Rastislav Serbin, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD.

Date of last modification: 06.10.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SPIII/15	**Course name:** Semestral Project III

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Mastering independent and creative work concerning the preparation and implementation of scientific experiments in the laboratory on the basis of the assigned topic and the ability to present the results. Submission of the semester project.

Learning outcomes:
Work in the laboratory and creative processing of the assigned topic.

Brief outline of the course:
Selected experimental topics prepared within the diploma theses. Processing of results in the form of a comprehensive material and its presentation in departmental seminars or student scientific conferences.

Recommended literature:
According to the recommendations of project supervisors.
Current journal literature.

Course language:
Slovak, english.

Notes:

Course assessment
Total number of assessed students: 73

abs	n
100.0	0.0

Provides: prof. Mgr. Vasiľ Andruch, DSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, RNDr. Rastislav Serbin, PhD., prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD.

Date of last modification: 24.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in all seminars. In case of non-participation in a maximum of two seminars for serious reasons (e.g. illness), fulfillment of alternative criteria assigned by the teacher. After completing the course, the teacher will give an evaluation based on the activity and results of the student.

Learning outcomes:
After completing the course, the student is able to work independently in writing a thesis with an emphasis on accurate expression and adherence to ethical principles.

Brief outline of the course:
General principles of thesis writing, formal requirements of diploma thesis, plagiarism as a negative phenomenon. Processing of experimental results in the form of tables, figures and graphs. Method of citing literature, preparation for the defense of the diploma thesis.

Recommended literature:
As recommended by the teacher.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 432

A	B	C	D	E	FX
96.3	1.62	1.16	0.23	0.23	0.46

Provides: doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Mária Kožurková, CSc., doc. RNDr. Ján Imrich, CSc., prof. RNDr. Katarina 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., univerzitná profesorka, prof. RNDr. Zuzana Vargová, Ph.D., prof. RNDr. Vladimír Zeleňák, DrSc., doc. RNDr. Ivan

Potočňák, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Dušan Koščík, CSc., doc. RNDr. Slávka Hamuľaková, PhD., doc. RNDr. Ladislav Janovec, PhD., RNDr. Zuzana Kudličková, PhD., prof. Mgr. Vasiľ Andruch, DSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Miroslav Almáši, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, RNDr. Rastislav Serbin, PhD., RNDr. Radka Gorejová, PhD., RNDr. Ivana Šišoláková, PhD., Mgr. Nikolas Király, PhD., RNDr. Jana Shepa, PhD., prof. Dr. Andrii Vyshnikin, DrSc., RNDr. Natália Podrojková, PhD., RNDr. Veronika Niščáková, PhD., Serhii Zaruba, PhD.

Date of last modification: 25.01.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 70

A	B	C	D	E	FX
92.86	2.86	1.43	1.43	1.43	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, DSc., doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Rastislav Serbin, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD.

Date of last modification: 07.11.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

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

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 73

A	B	C	D	E	FX
94.52	1.37	2.74	1.37	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, DSc., RNDr. Rastislav Serbin, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD.

Date of last modification: 07.11.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ TVa/11	**Course name:** Sports Activities I.

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: I., II., P

Prerequisities:

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

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

Brief outline of the course:
Brief outline of the course:
The Institute of physical education and sport at the Pavol Jozef Šafárik University offers 20 sports activities aerobics; aikido, basketball, badminton, body-balance, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, fitness, indoor football, SM system, step aerobics, table tennis, chess, volleyball, tabata, cycling.
Additionally, the Institute of physical education and sport at the Pavol Jozef Šafárik University offers winter courses (ski course, survival) and summer courses (aerobics by the sea, rafting on the Tisza River) with an attractive programme, sports competitions with national and international participation.

Recommended literature:
BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571
BUZKOVÁ, K. 2006. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN 8024715252.
JARKOVSKÁ, H, JARKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: Grada. ISBN 9788024757308.
KAČÁNI, L. 2002. Futbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN 8089197027.
KRESTA, J. 2009. Futsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.
LAWRENCE, G. 2019. Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.
SNER, Wolfgang. 2004. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.
VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 16384

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.48	0.06	0.0	0.0	0.0	0.04	9.25	5.17

Provides: Mgr. Patrik Berta, Mgr. Agata Dorota Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Ladislav Kručanica, PhD., Mgr. Richard Melichar, Mgr. Petra Melicharová, PhD., Mgr. Marcel Čurgali, PhD., Mgr. Alena Buková, PhD., univerzitná docentka, doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD., Mgr. Ferdinand Salonna, PhD., Mgr. Július Evelley, PhD.

Date of last modification: 07.02.2024

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ TVb/11	**Course name:** Sports Activities II.

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II., P

Prerequisities:

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

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

Brief outline of the course:
Brief outline of the course:
The Institute of physical education and sport at the Pavol Jozef Šafárik University offers 20 sports activities aerobics; aikido, basketball, badminton, body-balance, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, fitness, indoor football, SM system, step aerobics, table tennis, chess, volleyball, tabata, cycling.
Additionally, the Institute of physical education and sport at the Pavol Jozef Šafárik University offers winter courses (ski course, survival) and summer courses (aerobics by the sea, rafting on the Tisza River) with an attractive programme, sports competitions with national and international participation.

Recommended literature:
BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571
BUZKOVÁ, K. 2006. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN 8024715252.
JARKOVSKÁ, H, JARKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: Grada. ISBN 9788024757308.
KAČÁNI, L. 2002. Futbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN 8089197027.
KRESTA, J. 2009. Futsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.
LAWRENCE, G. 2019. Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.
SNER, Wolfgang. 2004. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.
VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 14337

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
83.67	0.47	0.01	0.0	0.0	0.04	11.47	4.32

Provides: Mgr. Agata Dorota Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Marcel Čurgali, PhD., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Mgr. Richard Melichar, Mgr. Petra Melicharová, PhD., Mgr. Alena Buková, PhD., univerzitná docentka, doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD., Mgr. Ferdinand Salonna, PhD., Mgr. Július Evelley, PhD.

Date of last modification: 07.02.2024

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: I., II.

Prerequisities:

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

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

Brief outline of the course:
Brief outline of the course:
The Institute of physical education and sport at the Pavol Jozef Šafárik University offers 20 sports activities aerobics; aikido, basketball, badminton, body-balance, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, fitness, indoor football, SM system, step aerobics, table tennis, chess, volleyball, tabata, cycling.
Additionally, the Institute of physical education and sport at the Pavol Jozef Šafárik University offers winter courses (ski course, survival) and summer courses (aerobics by the sea, rafting on the Tisza River) with an attractive programme, sports competitions with national and international participation.

Recommended literature:
BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571
BUZKOVÁ, K. 2006. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN 8024715252.
JARKOVSKÁ, H, JARKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: Grada. ISBN 9788024757308.
KAČÁNI, L. 2002. Futbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN 8089197027.
KRESTA, J. 2009. Futsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.
LAWRENCE, G. 2019. Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.
SNER, Wolfgang. 2004. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.
VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 9620

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
87.8	0.06	0.01	0.0	0.0	0.02	5.16	6.95

Provides: Mgr. Marcel Čurgali, PhD., Mgr. Agata Dorota Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Mgr. Richard Melichar, Mgr. Petra Melicharová, PhD., Mgr. Alena Buková, PhD., univerzitná docentka, doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD., Mgr. Ferdinand Salonna, PhD., Mgr. Július Evelley, PhD.

Date of last modification: 07.02.2024

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I., II.

Prerequisities:

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

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

Brief outline of the course:
Brief outline of the course:
The Institute of physical education and sport at the Pavol Jozef Šafárik University offers 20 sports activities aerobics; aikido, basketball, badminton, body-balance, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, fitness, indoor football, SM system, step aerobics, table tennis, chess, volleyball, tabata, cycling.
Additionally, the Institute of physical education and sport at the Pavol Jozef Šafárik University offers winter courses (ski course, survival) and summer courses (aerobics by the sea, rafting on the Tisza River) with an attractive programme, sports competitions with national and international participation.

Recommended literature:
BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571
BUZKOVÁ, K. 2006. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN 8024715252.
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KRESTA, J. 2009. Futsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.
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SNER, Wolfgang. 2004. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.
VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 6052

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
82.19	0.26	0.03	0.0	0.0	0.0	8.67	8.84

Provides: Mgr. Marcel Čurgali, PhD., Mgr. Agata Dorota Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Mgr. Richard Melichar, Mgr. Petra Melicharová, PhD., Mgr. Alena Buková, PhD., univerzitná docentka, doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD., Mgr. Ferdinand Salonna, PhD., Mgr. Július Evelley, PhD.

Date of last modification: 07.02.2024

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 58

abs	n
100.0	0.0

Provides: prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, doc. RNDr. Ladislav Janovec, PhD., doc. RNDr. Slávka Hamuľaková, PhD., doc. RNDr. Mariana Budovská, PhD., RNDr. Ján Elečko, PhD., RNDr. Jana Špaková Raschmanová, PhD., RNDr. Monika Tvrdoňová, PhD., doc. RNDr. Mária Vilková, PhD., RNDr. Zuzana Kudličková, PhD., RNDr. Jana Šandrejová, PhD., univerzitná docentka, prof. Dr. Andrii Vyshnikin, DrSc., Serhii Zaruba, PhD., prof. Mgr. Vasiľ Andruch, DSc., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., RNDr. Rastislav Serbin, PhD., doc. Ing. Viera Vojteková, PhD.

Date of last modification: 01.12.2021

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II., P

Prerequisities:

Conditions for course completion:
Completion: passed
Condition for successful course completion:
- active participation in line with the study rule of procedure and course guidelines
- effective performance of all tasks: carrying a canoe, entering and exiting a canoe, righting a canoe, paddling

Learning outcomes:
Content standard:
The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature.
Performance standard:
Upon completion of the course students are able to meet the performance standard and:
- implement the acquired knowledge in different situations and practice,
- implement basic skills to manipulate a canoe on a waterway,
- determine the right spot for camping,
- prepare a suitable material and equipment for camping.

Brief outline of the course:
Brief outline of the course:
1. Assessment of difficulty of waterways
2. Safety rules for rafting
3. Setting up a crew
4. Practical skills training using an empty canoe
5. Canoe lifting and carrying
6. Putting the canoe in the water without a shore contact
7. Getting in the canoe
8. Exiting the canoe
9. Taking the canoe out of the water
10. Steering
a) The pry stroke (on fast waterways)
b) The draw stroke

11. Capsizing
12. Commands

Recommended literature:
1. JUNGER, J. et al. Turistika a športy v prírode. Prešov: FHPV PU v Prešove. 2002. ISBN 8080680973.
Internetové zdroje:
1. STEJSKAL, T. Vodná turistika. Prešov: PU v Prešove. 1999.
Dostupné na: https://ulozto.sk/tamhle/UkyxQ2lYF8qh/name/Nahrane-7-5-2021-v-14-46-39#!ZGDjBGR2AQtkAzVkAzLkLJWuLwWxZ2ukBRLjnGqSomICMmOyZN==

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 252

abs	n
36.11	63.89

Provides: Mgr. Dávid Kaško, PhD.

Date of last modification: 29.03.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II., P

Prerequisities:

Conditions for course completion:
Completion: passed
Condition for successful course completion:
- active participation in line with the study rule of procedure and course guidelines,
- effective performance of all the tasks defined in the course syllabus

Learning outcomes:
Content standard:
The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature.
Performance standard:
Upon completion of the course students are able to meet the performance standard and should:
- acquire knowledge about safe stay and movement in natural environment,
- obtain theoretical knowledge and practical skills to solve extraordinary and demanding situations connected with survival and minimization of damage to health,
- be able to resist and face situations related to overcoming barriers and obstacles in natural environment,
- be able implement the acquired knowledge as an instructor during summer sport camps for children and youth within recreational sport.

Brief outline of the course:
Brief outline of the course:
1. Principles of conduct and safety in the movement in unfamiliar natural environment
2. Preparation and guidance of a hike tour
3. Objective and subjective danger in the mountains
4. Principles of hygiene and prevention of damage to health in extreme conditions
5. Fire building
6. Movement in the unfamiliar terrain, orientation and navigation
7. Shelters
8. Food preparation and water filtering
9. Rappelling, Tyrolian traverse
10. Transport of an injured person, first aid

Recommended literature:

1. JUNGER, J. et al. Turistika a športy v prírode. Prešov: Fakulta humanitných a prírodných vied PU v Prešove. 2002. 267s. ISBN 80-8068-097-3.
2. PAVLÍČEK, J. Člověk v drsné přírodě. 3. vyd. Praha: Práh. 2002. ISBN 8072520598.
3. WISEMAN, J. SAS: příručka jak přežít. Praha: Svojtka & Co. 2004. 566s. ISBN 8072372807.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 489

abs	n
46.42	53.58

Provides: Mgr. Ladislav Kručanica, PhD.

Date of last modification: 16.05.2023

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.

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 ECTS credits: 6

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation in laboratory exercises and seminars; successful completion of the final test. Elaboration of 2 written assignments (or project), which will be one of the conditions for participation in the exam. Written test (50%) and oral examination (50%) during the examination period.
Participation in excursions to the municipal wastewater treatment plant and drinking water treatment plant.
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
The student acquires knowledge of the methods of water pretreatment.

Brief outline of the course:
Classification of technological processes of water treatment according to phase processes, nature of the process, quality of treated water. Selection of resources for the supply of the population. Requirements for the treatment process. Water purification. Coagulation. Influence of various factors on coagulation. Water disinfection. Water fluoridation. Water softening methods. Water demineralization. Methods for removing Fe and Mn. Drinking water treatment plant. Scheme. Brief characteristics of individual stages of adjustment. Technological schemes and equipment.
Composition and properties of wastewater. Wastewater classification. Classification of industrial wastewaters. Stages of industrial wastewater treatment. Municipal wastewater treatment plant. Scheme. Technological process of wastewater treatment. Brief characteristics of individual stages. Technological schemes and equipment.

Recommended literature:
1. Žáček, L. Chemické a technologické procesy úpravy vody, Praha: SNTL, 1981. 270 s.
2. Tölgyessy J. a kol. Chémia, biológia a toxikológia vody a ovzdušia. Bratislava, VEDA, 1984.
3. Kalavská D., Holoubek I. Analýza vôd. Bratislava, Alfa, 1989. 262 s.
4. Handbook of Water and Wastewater Treatment Technologies. Ed. By Nicholas P Cheremisinoff, Butterworth Heinemann, 2001. 576 p.
5. Principles of Water Quality Control, Ed. by Thy Tebbutt, Butterworth Heinemann, 1997. 288 p.

6. Water Technology. Ed. by N. F. Gray, Butterworth Heinemann, 2005. 600 p.

Course language:
Slovak

Notes:
The course is implemented by full-time or, if necessary, distance method using the MS Teams or BBB or a combined method. The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 191

A	B	C	D	E	FX
38.74	16.75	17.28	16.23	10.99	0.0

Provides: prof. Mgr. Vasil' Andruch, DSc., Serhii Zaruba, PhD.

Date of last modification: 22.07.2022

Approved: prof. Dr. Yaroslav Bazeľ, DrSc.