CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: CJP/ PFAJAKA/07	**Course name:** Academic English

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Active classroom participation, assignments handed in on time, 2 absences tolerated
1 test (13th week), no retake.
Presentation on chosen topic
Final evaluation- average assessment of test (50%), and presentation (50%).
Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less

Learning outcomes:
The development of students´ language skills - reading, writing, listening, speaking, improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects, development of pragmatic competence - students can efectively use the language for a given purpose, with focus on Academic English, level B2.

Brief outline of the course:
Formal and informal English
Academic English and its specific features
Key academic verbs and nouns
Linking words in academic writing, writing a paragraph, word-order, topic sentences
Word-formation - affixation
abstract
Selected aspects of English pronunciation, academic vocabulary
Selected functional grammar structures - defining, classifying, epressing opinion, cause-effect, paraphrasing

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

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

Notes:

Course assessment
Total number of assessed students: 416

A	B	C	D	E	FX
36.54	21.63	15.14	9.38	6.01	11.3

Provides: Mgr. Viktória Mária Slovenská

Date of last modification: 11.09.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ANCHU/21	**Course name:** Analytical Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
1. 3x test of analytical calculations (each 33%, minim. 50%).
2. Examination is composed of 3 questions (each for 33%, it is necessary to reach at least 50%).

Learning outcomes:
Survey of basic principles and tasks of analytical chemistry and applications of analytical methods in research and practice.

Brief outline of the course:
Subject and role of analytical chemistry. General principles and procedures - sampling, sample pre-treatment. Preparation of solutions. Evaluation of the results.
Classification of analytical reactions. Qualitative analysis of cations and anions. Basic principles of organic analysis.
Methods of quantitative analysis. General principles of gravimetry. Volumetric analysis.
Instrumental methods of analytical chemistry (basic principles, instrumentaion and applications) - electroanalytical, optical and separation methods.

Recommended literature:
D.Harvey, Modern Analytical Chemistry. McGraw Hill, Boston, 2000
Skoog D.A., Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985

Course language:

Notes:

Course assessment
Total number of assessed students: 75

A	B	C	D	E	FX
30.67	17.33	20.0	18.67	9.33	4.0

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 12.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ AnCHP/23	**Course name:** Analytická chémia v praxi

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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: prof. Mgr. Vasiľ Andruch, DSc.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/BPO/21	**Course name:** Bachelor Thesis and its Defence

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Oral presentation of the thesis results. Answering questions of the thesis oponent or members of the state examination board.

Recommended literature:

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
88.89	11.11	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 07.12.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FMZ/04	**Course name:** Basic Principles of Medicinal Chemistry

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Exam: Two written tests 2 x 50 pts., one test in the middle of the semester, the other in the examination period. A minimum of 26 points must be obtained in each test.
A 100 pts in total.
Assessment A: 91-100; B: 81-90; C: 71-80; D: 60-71; E: 51-60; FX: 0-50 pts.

Learning outcomes:
The student will acquire knowledge of the fundamental conceptions of medicinal chemistry, understanding of structure-activity relationships including space structure and chirality and their consequences on chemical and physico-chemical properties influencing biological activity. Gaining knowledge of the present state in the field of selected important groups of drugs, such as antibacterial, antiviral or antitumor drugs.

Brief outline of the course:
Introduction, classification of drugs, factors influencing design and activity of drugs of the third generation, drug chirality, search for new drugs, structure-activity relationships, antibacterial compounds, antitumor compounds, antiviral compounds, disinfectants, antitussives and expectorants.
1. The essence, subject and goal of medicinal chemistry
2. Factors influencing design and activity of drugs
3. Drug chirality
4. Search for new drugs
5. Structure-activity relationships
6. Chemotherapeutics of central and peripheral nervous system
7. Antibacterial compounds
8. Antitumor compounds
9. Antiviral compounds
10. Psychotropic drugs
11. Disinfectants
12. Antitussives and expectorants

Recommended literature:

1. Medicinal Chemistry: Principles and Practice, King F. D., Ed., The Royal Society of Chemistry, Thomas Graham House, Cambridge, 1994.
2. Advances in Drug Discovery Techniques: Harvey A. L., Ed., Wiley & Sons, Chichester, 1998.
3. Thomas G.: Medicinal Chemistry: An introduction. John Willey & Sons, 2000.

Course language:
Slovak

Notes:
Teaching is carried out in person or, if necessary, online using the 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: 230

A	B	C	D	E	FX
40.0	22.17	18.26	10.43	8.26	0.87

Provides: doc. RNDr. Mariana Budovská, PhD.

Date of last modification: 21.07.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ ZNCH/21	**Course name:** Basics of nanochemistry
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 2 / 1 **Per study period:** 28 / 14 **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course 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: prof. RNDr. Vladimír Zeleňák, DrSc.
Date of last modification: 21.11.2021
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/MINU/03	**Course name:** Basis of Mineralogy

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: I.

Prerequisities: ÚCHV/VCHU/10 or ÚCHV/VCHU/14 or ÚCHV/VCHU/15 or ÚCHV/ZAC2/10 or ÚCHV/VACH/10 or ÚCHV/CHG/09 or ÚCHV/ZCF/03

Conditions for course completion:
Verification of theoretical knowledge and recognizing minerals.
Semester project, practical test from recognizing of minerals, optional oral examination.

Learning outcomes:
To recognize the beauty of nature and to obtain basic knowledge from mineralogy. To familiarize students with properties of usual minerals and to recognize these minerals.

Brief outline of the course:
Basic terms and definitions, origin of minerals in nature. Basis of morphological and structural crystallography: characteristic properties of crystals, crystallographic laws, crystal structure, unit cells and their parameters, crystallographic systems with examples of minerals. Crystallochemistry: types of bonds and structures and their effect on the properties of minerals. Physical properties of minerals and their utilize in minerals classification. Basis of genetic and systematic mineralogy. Structure of silicates.

Recommended literature:
M. Košuth: Mineralógia. Elfa, s.r.o. Košice, 2001
V. Radzo: Mineralógia, Alfa Bratislava, 1987.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 40

A	B	C	D	E	FX
67.5	25.0	7.5	0.0	0.0	0.0

Provides: doc. RNDr. Ivan Potočňák, PhD.

Date of last modification: 03.05.2015

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ BVT/21	**Course name:** Battery and hydrogen technologies
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: I.	
Prerequisities:	
Conditions for course completion: 1. Participation in seminars (also applies to the online form of teaching) and laboratory practical exercises. Students are required to attend seminars and laboratory exercises. The relevant teacher who leads the seminar will justify the reasoned absence of the student (incapacity for work, family reasons, etc.) in a maximum of two seminars or laboratory exercises during the semester without the need for replacement. In the event of a longer-term reasoned absence (for example due to incapacity for work), the relevant teacher will provide the student with an alternative form of mastering the missed material; 2. Activity at seminars and laboratory practical exercises. The preparation of students and their regular monitoring is always assessed by the relevant teacher who conducts the seminar or laboratory exercise, within his/her competence. 3. The exam is observed in a regular oral form, resp. in case of restrictions of contact forms of the pedagogical process, the exam is performed by a suitable distance - electronic form. 4. To successfully master the subject, it is necessary to prove mastery of the required curriculum at least 51%.	
Learning outcomes: Students will gain knowledge and skills on battery and hydrogen technologies for a low-carbon economy.	
Brief outline of the course: Description of primary and secondary batteries and their role in the energy system: different battery types, concepts describing the storage capabilities of batteries in context of both energy and power, advantages and disadvantages. How an electric power system can affect the operation of a battery, for example, in a vehicle or for large scale storage. Different cathode and anode materials, electrolytes, additives in Li-ion batteries. Description of other hybrid storage systems: water power, flywheels, supercapacitors, fuel cells, etc. Calculation of capacity, efficiency, state of charge, Li diffusion rate, etc. Hydrogen technologies, hydrogen as an energy carrier, transition to a low-carbon economy, hydrogen valleys, hydrogen production, storage and distribution of hydrogen, electrolysis, fuel cell. Use of hydrogen as an energy storage, to power cars, for industry, buildings and households. Principle and types of electrolyzers.	

Principle and types of fuel cells.

Recommended literature:

Course language:
Slovak language.

Notes:
Teaching is carried out in person or, if necessary, remotely using the bbb or MS Teams 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: 4

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

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

Date of last modification: 25.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ BPR/23	**Course name:** Bezpečnostné predpisy v chémii

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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. Rastislav Serbin, PhD.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ BCHU/21	**Course name:** Biochemistry
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 3 / 1 **Per study period:** 42 / 14 **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities: ÚCHV/VCHU/10 or ÚCHV/VCHU/15 or ÚCHV/VACH/10 or ÚCHV/VCHU/14	
Conditions for course completion: Successful completion of the exam, which consists of two parts: (i) written and (ii) oral part. The student passes the exam if he / she obtains at least 60% of the points in the written part and at the same time adequately answers the asked questions in the oral part.	
Learning outcomes: Gain knowledge of: (i) the basic building blocks of biomacromolecules (proteins, DNA, RNA, fats and sugars) and their properties, (ii) the basic biochemical processes that take place in living organisms, (iii) the way energy is produced and used in cells.	
Brief outline of the course: 1. Protein Structure and Function, Exploring proteins. 2. DNA and RNA and the Flow of Genetic Information, Exploring genes. 3. Enzymes: Basic Concepts and Kinetics, Catalytic Strategies and Regulatory Strategies. 4. Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides – Functions and Properties). 5. Lipids and Cells Membranes, Membrane Channels and Pumps. 6. Metabolis: Basic Concepts and Design, Signal-Transduction Pathways. 7. Glycolysis and Gluconeogenesis, Glycogen Metabolism. 8. The Citric Acid Cycle and Glyoxylate Cycle. 9. Oxidative Phosphorylation, The Light Reactions of Photosyntesis. 10. The Calvine Cycle and the Pentose Phosphate Pathway. 11. Fatty Acids Metabolism, Urea Cycle. 12. DNA Replication, Transcription (RNA Synthesis). 13. Protein Synthesis & Degradation, the Integration of Metabolism.	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 85

A	B	C	D	E	FX
28.24	12.94	14.12	22.35	20.0	2.35

Provides: prof. RNDr. Erik Sedlák, DrSc., RNDr. Nataša Tomášková, PhD., prof. RNDr. Mária Kožurková, CSc., Mgr. Mária Tomková, PhD.

Date of last modification: 14.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/PBC1/00	**Course name:** Biochemistry Practical

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:

Course level: I.

Prerequisities: ÚCHV/BCH1a/03 or ÚCHV/BCH1a/21

Conditions for course completion:
Active participation with a maximum of one excused absence without the need for compensation. In case of excused absence from two or more practical exercises (e.g. due to illness), the student agrees with the teacher on alternative dates for practice.
Correctly prepared protocols from all completed tasks.
At least 51% of points from each of the written tests.

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

Brief outline of the course:
1. Biochemistry laboratory safety rules. Basic biochemical laboratory procedures.
2. Qualitative tests for amino acids and proteins.
3. Isolation of casein from milk. Determination of protein concentration by Lowry method.
4. Determination of the iodine number by Yasud method . Soap production. Reactions with soap. Oxidation of unsaturated fatty acids.
5. Saponification number of fats and oils. Qualitative test for cholesterol: Salkowsky reaction.
6. Qualitative tests for carbohydrates. Determination of reducing carbohydrates by the Schoorl's method.
7.Determination of reducing and nonreducing carbohydrates in germinant plants.
8. Time-dependent course of enzyme-catalyzed reaction: digestion of gelatin by trypsine.
9. Determination of catalase activity and the first order rate constant. Effect of pH on alpha-amylase activity.
10. Effect of substrate concentration on initial rate of reaction, determination of Km and Vmax for urease-catalyzed hydrolysis of urea.
11. Isolation of DNA from spleen. Isolation of RNA from yeast. Qualitative tests for DNA and RNA components.
12. Determination of vitamin C concentration by 2,4-dinitrofenylhydrazine. Determination of vitamins A, B1, and C.

13. Final evaluation of students.

Recommended literature:
Sedlák, Varhač, Danko, Paulíková, Podhradský: Praktické cvičenia z biochémie, 2020, https://unibook.upjs.sk/sk/chemia/1411-prakticke-cvicenia-z-biochemie

Course language:
Slovak

Notes:
Teaching is carried out in person.

Course assessment
Total number of assessed students: 492

A	B	C	D	E	FX
55.28	27.44	10.16	5.49	1.22	0.41

Provides: prof. RNDr. Mária Kožurková, CSc., RNDr. Nataša Tomášková, PhD., doc. RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, RNDr. Lukáš Trizna, PhD.

Date of last modification: 19.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:
Test or seminar works
examination

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 376

A	B	C	D	E	FX
42.02	27.39	19.15	5.85	5.32	0.27

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

Date of last modification: 28.10.2021
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BTC/04	**Course name:** Biotechnology

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Written test, from which the student must obtain at least 51 %.

Learning outcomes:
Students obtained the knowledge of basic biotechnological processes and their applications in agriculture, industry, enviromental technologies, food production and medicine.

Brief outline of the course:
Characterization of biotechnology. Methods of cultivation and preservation of microorganisms. Composition, preparation and sterilization of nutrient soils. Classification of bioreactors. Biogas. Biotechnological waste treatment. Importance of carbohydrates and lipids produced by microorganisms. Aerobic and anaerobic fermentation. Biotechnological production of alcohols, organic acids and solvents. Isolation and using of amino acids. Production of yeast, vitamin C and antibiotics.

Recommended literature:
Z. Vodrážka: Biotechnologie, Academia Praha, 1992.
B. Sykita: Biotechnologie pro farmaceuty, FaF UK Praha, 1984.
E.M.T. El-Mansi et al, Fermentation microbiology and biotechnology,second edition, 2007.
Y.H. Hui, Food biochemistry & food processing, Blackwell Publishing 2006.
J.E. Smith, Biotechnology, Cambridge university press 2009.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 166

A	B	C	D	E	FX
34.34	28.31	22.89	10.84	3.01	0.6

Provides: RNDr. Danica Sabolová, PhD., univerzitná docentka

Date of last modification: 11.01.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ZCVU/04	**Course name:** Chemical Engineering

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: I., III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
General and Inorganic Engineering; Mineral raw materials; Raw materials processing, transport and holding; Chemical reactors; Chemical metallurgy – Fe, Al, Cu working; Inorganic acids manufacture (H2SO4, HNO3, HCl, HF, H3PO4); Industrial electrochemistry; Industrial fertilizers; Silicate industry – cement manufacture, ceramics; Petrochemistry

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 22

A	B	C	D	E	FX	N	P
22.73	54.55	13.64	4.55	0.0	0.0	0.0	4.55

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

Date of last modification: 21.01.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHV1/99	**Course name:** Chemical calculations

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.

Prerequisities:

Conditions for course completion:
Successful completion of two written tests in the middle and at the end of the semester. Accomplished test is with minimal 50% of point. The exact dates will be determined after mutual consultation between the teacher and the students.
The rating scale is determined as follows: A (100-91%), B (90-81%), C (80-71%), D (70-61%), E (60-51%), Fx (50- 0%).

Learning outcomes:
To teach students how to calculate material balances in the systems with or without chemical processes and how to calculate examples concerning the chemical equilibrium.

Brief outline of the course:
Expression of the clear matter amount and the system composition. Stoichiometric formula. Material bilances for preparation, dissolving and mixing of solutions, and for separating of mixtures. Material bilances for combined processes. Chemical equations and material bilances in the systems with chemical processes. Acid-Base equilibrium and the pH calculations. The solubility product and solubility.

Recommended literature:
Potočňák I.: Chemické výpočty vo všeobecnej a anorganickej chémii (skriptum), PF UPJŠ, Košice, 2017.
https://unibook.upjs.sk/sk/chemia/843-chemicke-vypocty-vo-vseobecnej-a-anorganickej-chemii
Any chemical laboratory tables.

Course language:
SK - slovak

Notes:
The subject is carried out in person or, if necessary, remotely using the online platform Big Blue Button (BBB). 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: 1727

A	B	C	D	E	FX
25.94	18.93	22.12	19.8	11.93	1.27

Provides: RNDr. Martin Vavra, PhD., doc. RNDr. Miroslav Almáši, PhD., Mgr. Nikolas Király, PhD.

Date of last modification: 15.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ ISCH1b/03	**Course name:** Cheminformatics II

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/ISC1a/03 or ÚCHV/ISC1a/00 or ÚCHV/ISVTC/14

Conditions for course completion:
In order to pass this course, each student must complete ALL of the following compulsory requirements: Students may only miss 1 exercise. Students must demonstrate the ability for advanced search in electronic information sources available within the licenced access of the University library and must submit all assignments (6). Students must complete: 2 assignments using scientometric database Scopus and/or Web of Science; 4 assignments using ChemSpider, Protein Data Bank, spectral or crystallographic databases, respectively other factual databases. Students must present a seminar works (3 presentations) within semester using sources of popular science websites and/or standard science portals as well. Students are assigned a grade in the course on the basis of submitted assignments. Students must obtain at least 51 percent of the total number of points within all submitted assignments. The final evaluation is assigned on the basis of the mark obtained within all submitted assignments. Students are assigned a grade in the course as follows: 100 - 91% (A), 90 - 81% (B), 80 - 71% (C), 70 - 61% (D), 60 - 51% (E), 50% and less FX. The examination can be extended to written and/or oral test as the examiner may determine.

Learning outcomes:
The student has the skills necessary for searching, sorting and processing scientific information in databases such as Web of Science, Cambridge structural database.... The acquired knowledge and skills should enable them to independently use specialized information sources for the preparation of bachelor theses, projects, diploma theses, etc..

Brief outline of the course:
Science Citation Index (Web of Science). Important scientific and chemical portals on the Internet (ChemWeb, Scopus, ..). Presentations of chem. data in electronic form. Chemical information and web applications. Factual databases - ChemSpider, PubChem, ... Structural databases - CSD, PDB, ...Presentation of seminar work.

Recommended literature:
1. Gasteiger J.(Editor), Engel T.(Editor): Chemoinformatics : A Textbook. John Wiley & Sons, 2004, ISBN 3-527-30681-1
2. Internet resources

Course language:

slovak language and english language

Notes:
In-person course, alternatively online course using the BigBlueButton tool or MS Teams.
The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 110

A	B	C	D	E	FX
99.09	0.0	0.0	0.0	0.91	0.0

Provides: doc. RNDr. Ivan Potočňák, PhD., doc. RNDr. Ladislav Janovec, PhD.

Date of last modification: 11.08.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/CHŠS/23	**Course name:** Chémia - štátna skúška

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: I.

Prerequisities: ÚCHV/VCHU/14 and ÚCHV/PLCV/23 and ÚCHV/OST/23 and ÚCHV/AANCH/03 and ÚCHV/OCHU/21 and ÚCHV/FCHU/10 and ÚCHV/ACHU/21 and ÚCHV/BCHU/21 and ÚCHV/ZCVU/04

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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:

Date of last modification: 19.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Active participation in class and completed homework assignments. Students are allowed to miss two classes at the most.
2 credit tests (presumably in weeks 6/7 and 12/13) and an oral presentation in English.
Final evaluation consists of the scores obtained for the 2 tests (50%) and the presentation (50%).
Final grade will be calculated as follows: A 93-100 %, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64 % and less.

Learning outcomes:

Brief outline of the course:

Recommended literature:
www.bbclearningenglish.com
Štěpánek, Libor a kol. Academic English-Akademická angličtina. Praha: Grada Publishing, a.s., 2011.
McCarthy M., O'Dell F.: English Vocabulary in Use, Upper-Intermediate. CUP, 1994.
Fictumova J., Ceccarelli J., Long T.: Angličtina, konverzace pro pokročilé. Barrister and Principal, 2008.
Peters S., Gráf T.: Time to practise. Polyglot, 2007.
Jones L.: Communicative Grammar Practice. CUP, 1985.
Additional study materials.

Course language:
English language, B2-C1 level according to CEFR

Notes:

Course assessment
Total number of assessed students: 301

A	B	C	D	E	FX
45.18	20.93	17.61	7.64	5.98	2.66

Provides: Mgr. Barbara Mitríková

Date of last modification: 11.02.2024
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Active classroom participation (maximum 2 absences tolerated), homework assignments completed by given deadlines.
Powerpoint presentation of a topic related to the study field.
Final Test - end of semester, no retake
Final assessment = average of test and presentation.
Grading scale: A 93-100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less

Learning outcomes:
The development of students´ language skills - reading, writing, listening, speaking, improvement of their communicative linguistic competence. Students acquire knowledge of selected phonological, lexical and syntactic aspects, development of pragmatic competence. Students can efectively use the language for a given purpose, with focus on Academic English and English on level B2.

Brief outline of the course:
Selected aspects of English grammar and pronunciation
Word formation
Contrast of tenses in English
The passive voice
Types of Conditionals
Phrasal verbs and English idioms
Words order and collocations, prepositional phrases

Recommended literature:
Vince M.: Macmillan Grammar in Context, Macmillan, 2008
McCarthy, O'Dell: English Vocabulary in Use, CUP, 1994
www.linguahouse.com
esllibrary.com
bbclearningenglish.com
ted.com/talks

Course language:

English language, level B2 according to CEFR.

Notes:

Course assessment
Total number of assessed students: 446

A	B	C	D	E	FX
41.48	19.51	15.7	7.85	5.61	9.87

Provides: Mgr. Viktória Mária Slovenská, Mgr. Lýdia Markovičová, PhD.

Date of last modification: 20.09.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KGER/ NJKG/07	**Course name:** Communicative Grammar in German Language

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most (2x90 min.). 2 control tests during the semester. Final grade will be calculated as follows: A 93-100 %, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64 % and less.

Learning outcomes:
The aim of the course is to identify and eliminate the most frequent grammatical errors in oral and written communication, learning language skills of listening comprehension, speaking, reading and writing, increasing students 'language competence (acquisition of selected phonological, lexical and syntactic knowledge), development of students' pragmatic competence (acquisition of the ability to express selected language functions), development of presentation skills, etc.

Brief outline of the course:
The course is aimed at practicing and consolidating knowledge of morphology and syntax of German in order to show the context in grammar as a whole. The course is intended for students who often make grammatical errors in oral as well as written communication. Through the analysis of texts, audio recordings, tests, grammar exercises, monologic and dialogical expressions of students focused on specific grammatical structures, problematic cases are solved individually and in groups. Emphasis is placed on the balanced development of grammatical thinking in the communication process, which ultimately contributes to the development of all four language skills.

Recommended literature:
Dreyer, H. – Schmitt, R.: Lehr- und Übungsbuch der deutschen Grammatik. Hueber Verlag GmbH & Co. Ismaning, 2009.
Krüger, M.: Motive Kursbuch, Lektion 1 – 30. Huebert Verlag GmbH & Co. Ismaning, 2020.
Brill, L.M. – Techmer, M.: Deutsch. Großes Übungsbuch. Wortschatz. Huebert Verlag GmbH & Co. Ismaning, 2011.
Földeak, Hans: Sag's besser!. Grammatik. Arbeitsbuch für Fortgeschrittene. Huebert Verlag GmbH & Co. Ismaning, 2001.
Geiger, S. – Dinsel, S.: Deutsch Übungsbuch Grammatik A2-B2. Huebert Verlag GmbH & Co. Ismaning, 2018.
Dittelová, E. – Zavatčanová, M.: Einführung in das Studium der deutschen Fachsprache. Košice: ES UPJŠ, 2000.

Course language:
German, Slovak language

Notes:

Course assessment
Total number of assessed students: 57

A	B	C	D	E	FX
61.4	10.53	8.77	3.51	8.77	7.02

Provides: Mgr. Ulrika Strömplová, PhD.

Date of last modification: 13.08.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ PFAJ4/07	**Course name:** English Language of Natural Science

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Active participation in class and completed homework assignments. Students are allowed to miss 2 classes at the most
Continuous assessment:
1 credit test taken presumably in weeks 6/7
1 project (quiz on the topic of the student´s field of study) 25% of the continuous assessment
5 LMS quizzes (25% of the continuous assessment)
In order to be admitted to the final exam, a student has to score at least 65 % from the continuous assessment
The exam test results represent 50% of the final grade for the course, continuous assessment results represent the other 50% of the final grade.
The final grade for the course will be calculated as follows:
A 93-100, B 86-92, C 79-85, D 72-78, E 65-71, FX 64 and less.

Learning outcomes:
Enhancement of students' language skills (speaking, writing, reading and listening comprehension) in English for specific and academic purposes and development of students' linguistic competence. Students obtain knowledge of selected phonological, lexical and syntactic aspects of professional English, improve their pragmatic competence - students can effectively use the language for a given purpose, and acquire presentation skills at B2 level (CEFR) with focus on terminology of natural sciences.

Brief outline of the course:
1. Introduction to studying language
2. Selected aspects of scientific language
3. Talking about academic study
4. Discussing science
5. Defining scientific terminology and concepts
6. Expressing cause and effect
7. Describing structures
8. Explaining processes
9. Comparing objects, structures and concepts

10. Talking about problem and solution
11. Referencing authors
12. Giving examples
13. Visual aids and numbers
14. Referencing time and place
Presentation topics related to students´study fields.

Recommended literature:

lms.upjs.sk - e-kurz Odborný anglický jazyk pre prírodné vedy.
Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.
Armer, T.: Cambridge English for Scientists. CUP, 2011.
Wharton J.: Academic Encounters. The Natural World. CUP, 2009.
P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.
https://worldservice/learningenglish, https://spectator.sme.sk
www.isllibrary.com
linguahouse.com

Course language:
English, level B2 (CEFR)

Notes:

Course assessment
Total number of assessed students: 3239

A	B	C	D	E	FX
38.53	26.37	16.3	9.54	7.19	2.07

Provides: Mgr. Viktória Mária Slovenská, Mgr. Lenka Klimčáková, Mgr. Katarína Szabová, PhD.

Date of last modification: 06.02.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ EECH/03	**Course name:** Environmental 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: I., II.

Prerequisities:

Conditions for course completion:
Examination.

Learning outcomes:

Brief outline of the course:
The subject of environmental chemistry. Matter cycles on Earth. Geochemical cycles. Carbon, nitrogen, sulphur, phospohorous cycles. Metals and environment. Special cycles. Earth atmosphere composition, functions of atmosphere. Physical and chemical processes in atmosphere. Atmospheric photochemistry. Pollutants in atmosphere and greenhouse effect. Models of greenhouse effects. Principles of air quality control. Energetic Earth balance. Water environment and pollutants monitored. Classification of pollutants and ways of elimination. Waste water cleaning processes. Analytical methods in environmental chemistry, applications. Soil analysis, biogeochemical processes. Acid rain, metal ions in soil. Environmental analysis, strategy and concepts.

Recommended literature:
1. G. Schwedt: The Essential Guide to Environmental Chemistry, Wiley and Sons, London 2001
2. R.N. Reeve, J.D. Barnes: General Environmental Chemistry, Wiley, London 1994

Course language:

Notes:

Course assessment
Total number of assessed students: 119

A	B	C	D	E	FX	N	P
49.58	19.33	16.81	2.52	3.36	0.0	0.0	8.4

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

Date of last modification: 07.11.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BACHZ/06	**Course name:** Fundamentals of 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:

Course level: I.

Prerequisities:

Conditions for course completion:
Elaboration and presentation of a semester project with an assigned topic. Completion of block exercises. Oral examination.
Detailed conditions for completing the subject are listed in the electronic bulletin board of the subject and in the repository of digital support materials LMS UPJŠ and are updated annually.

Learning outcomes:
After completing the course, the student has basic knowledge about biological samples, factors affecting biological samples and analytical methods used in clinical chemistry and bioanalysis.

Brief outline of the course:
Introduction to Bioanalytical Chemistry. Biological samples classification. Factors that affect analytes in biological samples. Collection, transport and storage of samples, the main principles of sampling, the suppressing of undesirable phenomena. Selected methods of pretreatment of biological samples. Analyzers, equipment and organization of work in a clinical laboratory. Control and management of quality in clinical laboratory. Quality manual, calibration, control, and reference materials. Validation and Good Laboratory Practice. Buffers in bioanalysis. Enzymes in bioanalysis, introduction, distribution, Mechanism of enzyme catalysis. The kinetics of enzymatic reactions with one substrate, the Michaelis constant, constant specificity, lag phase, kinetics of reactions with two substrates. Moderators of enzyme activity. Selected methods for the analysis of biomolecules.

Recommended literature:
1. Chromý, V. a kol.: Bioanalytika, MU Brno, 2002
2. Kukačka, J. a kol.: Bioanalytická chemie v príkladech a cvičeních, Karolinum, 2010
3. Mikkelsen, S.R, Cortón E.: Bioanalytical Chemistry, Wiley, 2004
4.Wilson I.: Bioanalytical Separations 4, (Handbook of Analytical Separations), Elsevier, 2003
5.Lee, D.C., Webb, M.: Pharmaceutical Analysis, Blackwell, 2003

Course language:

Notes:

If necessary, the teaching also takes place in a distance form with the use of various tools of LMS UPJŠ, MS teams, etc. The form of teaching is specified by the teacher at the beginning of the semester, it is continuously updated.

Course assessment

Total number of assessed students: 108

A	B	C	D	E	FX
33.33	30.56	30.56	4.63	0.0	0.93

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 22.07.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 7

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities: ÚCHV/CHV1/99

Conditions for course completion:
Written test in the middle and the end of the semester followed by the oral examination. Active participation on seminars.

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 362

A	B	C	D	E	FX
25.69	27.35	27.62	11.05	7.73	0.55

Provides: prof. RNDr. Vladimír Zeleňák, DrSc., doc. RNDr. Ivan Potočňák, PhD.

Date of last modification: 07.02.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ GAC/21	**Course name:** Green analytical chemisty and automatization

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: I.

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 green chemistry, miniaturization, and automation in analytical chemistry.

Brief outline of the course:
Green chemistry. Principles of green chemistry. Green Analytical Chemistry (GAC). Green instrumental techniques. Miniaturization and automation. Principles of individual methods of miniaturization and automation, instrumentation, advantages and disadvantages. Practical applications of procedures.

Recommended literature:
1. J. Labuda a kol. Analytická chémia, STU, Bratislava 2014.
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: 0

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

Provides: prof. Mgr. Vasiľ Andruch, DSc., RNDr. Jana Šandrejová, PhD., univerzitná docentka

Date of last modification: 22.07.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/PCH/22	**Course name:** Industrial Chemistry

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 8

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

Provides: prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Martin Vavra, PhD.

Date of last modification: 18.01.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ACPE1/03	**Course name:** Industrial Ecology

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: I.

Prerequisities:

Conditions for course completion:
On the basis of an interim assessment that is higher than 51%: during the semester, 4 mid-term tests are written, and it is also mandatory to prepare and present one seminar work on the given topic. In order to be admitted to the exam, the evaluation of the interim tests together with the evaluation of the seminar work must be higher than 51%. 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 knowledge in the field of industrial ecology and environmental chemistry of all abiotic components of the environment (in the context of industrial ecology).

Brief outline of the course:
Familiarization with the concept of industrial ecology and its use in environmental protection and the development of green technologies.
Selected topics of environmental chemistry (environmental chemistry of all abiotic components of the environment - environmental chemistry of atmosphere, hydrosphere, pedosphere and part of the geosphere: the earth's crust) in the context of industrial ecology.
Selected topics of industrial, clinical toxicology and ecotoxicology in the context of industrial ecology.

Recommended literature:
S. E. Manahan: Industrial Ecology., CRC Press, New York, 1999.
S. E. Manahan: Environmental Chemistry. , CRC Press, New York, 2005.
R. U. Ayres, L. Ayres: A handbook of industrial ecology, Edward Elgar Publishing, 2002.

Course language:
Slovak language

Notes:
Teaching 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: 167

A	B	C	D	E	FX
25.75	20.96	25.75	14.97	11.98	0.6

Provides: doc. Ing. Viera Vojteková, PhD.

Date of last modification: 03.08.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ACHU/21	**Course name:** Inorganic Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/VCHU/15

Conditions for course completion:
Written test in the middle and the end of the semester followed by the oral examination. Active participation on seminars.

Learning outcomes:
Gaining knowledge about the properties and reactivity of elements and their compounds, the periodicity of their properties and the periodicity of the properties of their compounds. Knowledge of the basic physical and chemical properties of elements and their compounds, reactivity, their preparation, production and occurrence.

Brief outline of the course:
Electronic configuration, abundance, use, physical and chemical properties, preparation, reactivity of non-metallic elements hydrogen, halogens, oxygen, sulphur, nitrogen, phosphorus, carbon, silicon, boron and rare gases. Binary and other compounds formed by these elements, their properties and reactivity. Metals and transition elements. Abudance, properties, reactivity, important compounds.

Recommended literature:
Greenwood, N. N., Earnshaw, A: Chemistry of the Elements. Pergamon Press, Oxford, 1984
Atkins O., Overton T., Rourke J., Weller M., Armstrong F.: Inorganic Chemistry, University Press, Oxford, 2006.

Course language:

Notes:

Course assessment
Total number of assessed students: 90

A	B	C	D	E	FX
31.11	30.0	24.44	7.78	6.67	0.0

Provides: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Juraj Černák, DrSc.

Date of last modification: 07.02.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ FUMCH1/03	**Course name:** Introduction to Material 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: I., II.

Prerequisities:

Conditions for course completion:
1. Participation in seminars (also applies to the online form of teaching). Students are required to attend seminars. The relevant teacher who leads the seminar will justify the student's justified non-participation (incapacity for work, family reasons, etc.) in a maximum of two seminars during the semester without the need for substitute performance. In the case of a longer-term justified absence (for example due to incapacity for work), the relevant teacher will assign the student an alternative form of mastering the missed material.
2. Activity at seminars. The preparation of students and their activity in seminars is always assessed by the relevant teacher who leads the seminar, within his / her competence.
3. Elaboration and submission of a seminar paper on an assigned topic within the independent work at home and presentation of the most important conclusions of the seminar paper in the form of a PPT presentation. The seminar papers must be handed over to the relevant teacher who leads the seminars by the 12th week of the semester, and the presentation must take place no later than the 8th week of the semester. The seminar work and performance are evaluated by the relevant teacher. Submission of the seminar paper and its successful defense is a condition of admission to the oral exam.
4. The exam is usually carried out orally, resp. in case of restrictions of contact forms of the pedagogical process, the exam will be performed in a suitable distance - electronic form.
5. To successfully master the subject, it is necessary to prove mastery of the required curriculum at least 51%.

Learning outcomes:
To present the different types of functional materials, their atomic structure and mechanical properties.

Brief outline of the course:
Historical perspectives. Materials and human being. Participation of natural science in material engineering. Material revolutions. Classification of materials. Atomic structure and interatomic bonding. Amorphous and crystalline materials. Mechanics of materials. Imperfections in solids. Crystal lattice defects. Point defects. Line defects. Dislocations. Diffusion. Diffusion mechanisms. Deformations and failures, re-crystallization. Deformations. Plastic deformations. Solid solutions. Intermediary phases. Phases in ceramic systems. Phase transformations. Crystallization of metals.

Phase identification methods. Stress and strain. Structure of metallic and ceramic materials. Alloys. Steel. Light metals. Metallic glasses. Gold. Inorganic non-metallic materials. Ceramic construction materials. Ceramic tools. Bio-ceramics. Ceramics in cosmos. High-temperature superconductors. Glass. Building binders. Polymers. Essence of polymers. Thermoplastics. Reactoplastics. Polymer structure. Mechanical properties of polymers. Natural materials. Wood. Bones. Teeth. Conchs and shells. Tectrices.

Recommended literature:

W. D. Callister, Jr.: Fundamentals of Materials Science and Engineering, John Wiley & Sons, 2001.
Brian S. Mitchell: An Introduction to Materials Engineering and Science: For Chemical and Materials Engineers, John Wiley & Sons,
2004.

Course language:
Slovak language.

Notes:
Teaching is carried out in person or, if necessary, remotely using the bbb or MS Teams 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: 81

A	B	C	D	E	FX
90.12	8.64	0.0	0.0	0.0	1.23

Provides: prof. RNDr. Renáta Oriňaková, DrSc.

Date of last modification: 25.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/IP/23	**Course name:** Inštrumentálne praktikum

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 0 / 6 **Per study period:** 0 / 84
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides: doc. RNDr. Miroslav Almáši, PhD., Mgr. Michaela Rendošová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Slávka Hamuľaková, PhD., univerzitná docentka, prof. RNDr. Renáta Oriňaková, DrSc., doc. RNDr. Viktor Víglaský, PhD.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MKLP/23	**Course name:** Manažment kvality a správna laboratórna prax

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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: doc. Ing. Viera Vojteková, PhD.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MTCa/22	**Course name:** Mathematics I for chemists

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
To complete the course, it is necessary to demonstrate the acquirement of basic mathematical terms and the ability to solve problems from selected thematic units.
The evaluation of the subject is according to the results from the semester and in view of the results of the written final test. During the semester, students write tests at all seminars (together 20 points) and two extensive tests (together 50 points). It is necessary to obtain at least 28 points during the semester. Then students may write the exam. To pass the exam, it is necessary to obtain at least 12 points from the maximum number of 30 points. The scale for student evaluation is as follows: 100-80-A, 79-70-B, 69-60-C, 59-50-D, 49-40-E. If a student does not achieve the required mninimal number of points from the exam test (12 points) and during the semester (together 28 points), he/she is evaluated by FX.

Learning outcomes:
After completing the course, the student can use basic mathematical terms, can solve various equations and inequations, and is acquainted with basic mathematical knowledge from the differential and integral calculus, and is able to apply the theory in concrete excercises.

Brief outline of the course:
Week 1-6: Definition of function. Domain and range of functions. Elementary functions. Inverse functions. Compositions of functions.
Week 7-14: Limit of functions. Continuity of functions. Derivation and its geometric aplications. Indefinite integrals, basic methods of integration. Definite integral and its applications.

Recommended literature:
Huťka, Benko, Ďurikovič: Matematika, Alfa, Bratislava 1991
D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006
D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006
S. Lang: A First Course in Calculus, Springer Verlag, 1998

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 640

A	B	C	D	E	FX
11.41	10.94	16.41	21.09	28.28	11.88

Provides: RNDr. Jana Borzová, PhD., RNDr. Miriam Kleinová, PhD., RNDr. Miriama Kmeciková, RNDr. Monika Krišáková

Date of last modification: 18.04.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ NANO/09	**Course name:** Nanotechnology

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: I.

Prerequisities:

Conditions for course completion:
1. Participation in seminars (also applies to the online form of teaching) and laboratory exercises. Students are required to attend seminars and laboratory exercises. The relevant teacher who leads the seminar or practical exercise will justify the student's justified non-participation (incapacity for work, family reasons, etc.) in a maximum of two seminars during the semester without the need for substitute performance. In the case of a longer-term justified absence (for example due to incapacity for work), the relevant teacher will assign the student an alternative form of mastering the missed material.
2. Activity at seminars and practical exercises. The preparation of students and their activity in seminars and exercises is always assessed by the relevant teacher who conducts the seminar or exercise, within his / her competence.
3. The exam is carried out in the form of a written test, resp. in case of restrictions of contact forms of the pedagogical process, the exam will be performed in a suitable distance - electronic form.
4. To successfully master the subject, it is necessary to prove mastery of the required curriculum at least 51%.

Learning outcomes:
To provide the students with basic knowledge of nanotechnology, nanomaterials as well as preparation and investigation methods. Discusses current and future nanotechnology applications in engineering, physics, chemistry, biology, electronics and computing, energy and medicine.The students will obtain first knowledge on nanotechnology as well about the funktions of nanostructured surfaces.

Brief outline of the course:
Properties of nanomaterials. Methods of preparation of thin layers and nanostructured surfaces. Methods of submicron-sized structures production. Nanodevices and chips. Methods of nanomaterials structure investigation. Nanodevices and chips. Nanofluidic systems in biology, medicine , energy storage and catalysis.

Recommended literature:
1. Nanotechnológie, A. Oriňák, R. Oriňáková, A. Fedorková, PF UPJŠ, 2012.
2. Introduction to Nanotechnology, C. Poole Jr., F.J. Owens, Wiley (2003).

3. Nanoelectronics and Nanosystems, Karl Goser, Peter Glosekotter, Jan Dienstuhl., Springer, 2004.
4. Nano: The Essentials: T. Pradeep. McGraw – Hill education – 2007.
5. Nanofabrication Towards Biomedical Applications, Techniques, Tools, Applications and Impact. 2005 - By Challa, S.S.R. Kumar, Josef Hormes, Carola Leuschaer. Wiley – VCH.

Course language:
Slovak language.

Notes:
Teaching is carried out in person or, if necessary, remotely using the bbb or MS Teams 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: 201

A	B	C	D	E	FX	N	P
27.86	23.38	24.38	12.94	6.97	1.0	0.0	3.48

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

Date of last modification: 25.07.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/OST/23	**Course name:** Odborná stáž

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

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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:

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ OCHU/21	**Course name:** Organic chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/VCHU/15 or ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10

Conditions for course completion:
Written test. Two tests, in 7th and 14th week. Test max 50 points. A student must obtain at least 51% of points. Writing of the tests is mandatory.
Written exam, 100 points. 69 Theoretical questions (69 points), 62 chemical formulas (31 points). A student must obtain at least 51% of points. Final evaluation: A 91-100 pts, B 81-90 pts, C 71-80 pts, D 61-70 pts, E 51-60 pts, FX 0-50 pts.

Learning outcomes:
Basic organic chemistry course.
Nomenclature of organic compounds, their chemical properties, structure, reactivity and characteristic reactions. Preparation of organic molecules, explanation of the basic mechanisms and principles of organic reactions.
After completing the subject, the student understands the studied theories, principles, methods and logical procedures of organic chemistry. He has knowledge of modern organic chemistry with an emphasis on the current development of knowledge in the aforementioned area.

Brief outline of the course:
Chemical bonding Hybridization and Bonding Covalent bonds Double bonds and Triple Bonds Structural Formulas of Organic Molecules Polar Covalent Bonds and Electronegativity Constitutional Isomers Alkenes Electrophilic Additions Strong Brønsted Acids Lewis Acids (non-Proton Electrophiles) Electrophilic Halogen Reagents Other Electrophilic Reagents Reduction Oxidation Radical Additions Allylic Substitution Alkynes Addition Reactions Hydrogenation Electrophiles Hydration & Tautomerism Hydroboration Nucleophilile Addition & Reduction Acidity of Terminal Alkynes (Substitution of H) Alkyl Halides General Reactivity Substitution(of X) SN2 Mechanism SN1 Mechanism Elimination (of HX) Summary of Substiution vs. Elimination Substitution by Metals Elimination Reactions of Dihalides Alcohols Reactions of Alcohols Substitution of the Hydroxyl H Substitution of the Hydroxyl Group Elimination of Water Oxidation of Alcohols Reactions of Phenols Acidity of Phenols Ring Substitution of Phenols Oxidation to Quinones Aromatic compounds Electrophilic Substitution A Substitution Mechanism Reactions of Substituted Benzenes Reaction Characteristics Reactions of Disubstituted Rings Reactions of Substituent Groups Nucleophilic Substitution, Elimination & Addition Reactions Amines Basicity of Nitrogen Compounds Acidity of Nitrogen Compounds Important Reagent Bases Reactions of

Amines Electrophilic Substitution at Nitrogen Preparation of 1°-Amines Preparation of 2° & 3°-Amines Reactions with Nitrous Acid Reactions of Aryl Diazonium Intermediates Elimination Reactions of Amines Oxidation States of Nitrogen Basic information: Aldehydes & Ketones Carboxylic Acids Derivatives of Carboxylic acids Natural products

Recommended literature:

1. Organic chemistry, J. Clayden, N. Greeves Warren, S. Wothers, Oxford University Press, 2012, ISBN 978-0-19-92-7029-3.
2. Organic chemistry, J. E. McMurry, Brooks/Cole, a Thomson Learning Company 2004, Sixth Eddition, ISBN 0534389996.
3. Organic chemistry, P. Zahradník, M. Mečiarová, P. Magdolen, Univerzita Komenského v Bratislave, 2019, ISBN: 978-80-223-4589-7.

Course language:

anglický

Notes:

Teaching is carried out in person or, if necessary, online using the MS Teams 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: 83

A	B	C	D	E	FX
12.05	9.64	22.89	42.17	12.05	1.2

Provides: RNDr. Slávka Hamuľaková, PhD., univerzitná docentka, doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, doc. RNDr. Mária Vilková, PhD.

Date of last modification: 04.08.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/POC1/03	**Course name:** Organic chemistry - Lab

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:

Course level: I.

Prerequisities: ÚCHV/OCH1a/10

Conditions for course completion:
100% participation in practical exercises.
Two written tests 2 x 25 pts (a minimum of 13 points must be obtained in each test), twelve reports 12 x 2 pts, laboratory skills 12 pts, short quizzes and questions 14 pts.
A 100 pts. in total.
Assessment A: 91-100; B: 81-90; C: 71-80; D: 60-71; E: 51-60; FX: 0-50 pts.

Learning outcomes:
Students will become familiar with the basic isolation and purification methods used in a synthetic laboratory. Students should master basic laboratory technique and be able to apply the theoretical knowledge from the basic course of organic chemistry in simple synthetic projects.

Brief outline of the course:
Preparation, isolation, purification and identification of organic compounds. The emphasis is on gaining the experimental skills in synthesis of organic compounds, distillation, extraction, crystallization, sublimation and thin-layer chromatography.
1. Isolation and purification methods - crystallization
2. Isolation and purification methods - distillation
3. Preparation of ethyl acetate
4. Preparation of acetylsalicylic acid
5. Preparation of benzalaniline
6. Spectral methods in organic chemistry
7. Preparation of acetophenone oxime
8. Preparation of benzilic acid
9. Preparation of 4,5-diphenylimidazole
10. Isolation of caffeine from tea
11. Isolation of trimyristin from nutmeg

Recommended literature:
1. Handout with experimental procedures http://kekule.science.upjs.sk/pochu.
2. Organic chemistry lectures.

Course language:

Slovak or English

Notes:

Course assessment
Total number of assessed students: 503

A	B	C	D	E	FX
51.49	30.02	12.72	4.17	0.8	0.8

Provides: RNDr. Kvetoslava Stanková, PhD., RNDr. Jana Špaková Raschmanová, PhD., RNDr. Slávka Hamuľaková, PhD., univerzitná docentka, doc. RNDr. Mariana Budovská, PhD., RNDr. Ján Elečko, PhD.

Date of last modification: 09.01.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FCHU/10	**Course name:** Physical Chemistry

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

Number of ECTS credits: 6

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/VCHU/14 or ÚCHV/VCHU/10 or ÚCHV/VACH/10 or ÚCHV/VCHU/15

Conditions for course completion:
Active participation in seminars. Two partial tests from computational seminars, each must be mastered at A-E. In the case of distance learning, it is necessary to prepare 2 assignments, each must be mastered at 80%.
Examination, unerstanding of three thematic areas of the subject (thermodynamics, electrochemistry, kinetics).

Learning outcomes:
Acquirement of the basics knowledgements of physical chemistry within the chapters: thermodynamics, phase equilibria, chemical equilibria, electrochemistry, chemical kinetics.

Brief outline of the course:
Fundamental concepts of thermodynamics, thermochemistry, chemical equilibrium, phase equilibria and diagrams, laws for ideal gas and reals gases, liquids, solutions, solutions of electrolytes. Electrochemistry: ionics and electrodics. Electrodes and electrochemical cells, corrosion. Chemical kinetics, catalysis. Adsorption.

Recommended literature:
T. Engel, P. Reid: Physical Chemistry, Pearson Educat. Inc., San Francisco 2006
P.W. Atkins: Physical Chemistry, Oxford University Presss, Oxford 1986, 1990, 1996
W.J. Moore: Physical Chemistry, Longman, London 1972 and newer editions

Course language:

Notes:
Teaching is carried out in person. If a distance form is required, the lectures will take place online, using the BigBlueButton tool (https://bbb.science.upjs.sk/). Other conditions will be specified by the teacher.

Course assessment
Total number of assessed students: 324

A	B	C	D	E	FX
32.72	19.75	14.2	17.9	12.35	3.09

Provides: RNDr. Ján Macko, PhD., RNDr. Ivana Šišoláková, PhD., univerzitná docentka
Date of last modification: 24.11.2021
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ CHF1a/22	**Course name:** Physics I

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
To successfully complete the course, the student must demonstrate sufficient knowledge of mechanics, molecular physics and thermodynamics.
The credit evaluation of the course takes into account the following student workload:
1 credits: direct teaching in lectures and numerical exercises, self-study of recommended literature, fulfillment of homework assignments
2 credits: successful mastery of numerical exercises and obtaining an A-E rating from two numerical papers in the 6th and 13th week of the semester
2 credits: obtaining the A-E evaluation from two theoretical papers in the 6th and 13th weeks of the semester and the evaluation for the oral exam.

Learning outcomes:
After completing the lectures and numerical exercises and after successfully passing the final exam, the student will demonstrate adequate mastery of the content standard of the course, which is defined by the brief content of the course and the recommended literature.
The result of education is:
a) Complementing and summarizing knowledge of mechanics, molecular physics and thermodynamics.
b) They will learn to apply the mastered subject matter to the numerical solution of relevant physical problems and problems.
c) Creates the necessary terminological and knowledge base for mastering related subjects.

Brief outline of the course:

Recommended literature:
1. Halliday D., Resnick R., Walker J.: Fyzika, VUTIUM Brno, 2000.
2. Krempasky J.: Fyzika, Veda Bratislava, 1982.
3. Hajko V., Daniel - Szabó J.: Základy fyziky, Veda, Bratislava 1983.
4. Horák Z., Krupka F.: Fyzika, SNTL a Alfa, Praha 1981.
5. Hajko V. a kol: Fyzika v príkladoch, Alfa, Bratislava 1983.

Course language:
english

Notes:
Lectures can be done at presence form or online form using MS Teams and BBB. Education form is
updated at the begining of the subject. All ppt presentations are accesible in LMS UPJŠ.

Course assessment
Total number of assessed students: 51

A	B	C	D	E	FX
17.65	31.37	17.65	25.49	7.84	0.0

Provides: doc. RNDr. Adriana Zeleňáková, PhD.

Date of last modification: 30.09.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/PACH/03	**Course name:** Practical from Inorganic Chemistry

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:

Course level: I.

Prerequisities: ÚCHV/CHV1/99

Conditions for course completion:
test
Results from reports, tests. Achieved practical abilities.

Learning outcomes:
The practical acquirements at preparation and study of inorganic compounds and their physico-chemical properties by common laboratory techniques.

Brief outline of the course:
The utilization of common laboratory techniques and also the work in anaerobic, inert and non-aqueous conditions at preparation of elements (H2, O2, Cu, Ni), oxides(CO2, Al2O3·xH2O), nitrides(Mg3N2), acids (HNO3, H3BO3), salts((NH4)2SO4, KMnO4), binary salts(NH4)Fe(SO4)2·12H2O), halides (CuCl, CuCl2·2H2O, SnI4, CuBr2) and coordination compounds ([Cr2(CH3COO)4(H2O)2], [CoCl2(en)2]Cl, [Cu(NH3)4]SO4·H2O, K3[Al(C2O4)3]·3H2O).

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 542

A	B	C	D	E	FX
57.38	33.95	5.35	2.03	1.11	0.18

Provides: prof. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Juraj Kuchár, PhD., doc. RNDr. Miroslav Almáši, PhD., Mgr. Nikolas Király, PhD.

Date of last modification: 28.10.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PANCH/06	**Course name:** Practical in Analytical Chemistry

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:

Course level: I.

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 might excuse without substitute the student's absence (incapacity for work, family reasons, etc.) for a maximum of two exercises during the semester with substitute supplying.
2. The assigned teacher, who leads the seminar, assesses the preparation of students and their activity in seminars. For the active participation in the exercises, the student can get a maximum of 10 points.
3. Two written tests are obligatory. The written test will consist of 15 questions with 15 points, together for 2 written testes of 30 points. To successful completion of the exam, it is necessary to achieve at least 8 points from each test.
Overall score: Max. number of points: 50 (elaboration of protocols / assignments - 10 points; active participation in practical exercises - 10 points; written tests - 2 × 15 points). Min. number of points to successful completion of course: 26.
Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

Learning outcomes:
Application of theoretical knowledge of quantitative analysis into analytical laboratory practise.

Brief outline of the course:
Practical in quantitative analysis. Quantitative methods. Gravimetry, general principles of method. Volumetric methods. Preparation of accurate solutions. Indication of equvivalency point. Titration curves, calculations in volumetric analysis, measurement errors. Acidimetry, alkalimetry. Manganometry. Iodometry. Complexometry. Argentometry. Selected instrumental analytical methods - electrochemical, optical, separation. Evaluation of the results in instrumental analysis.

Recommended literature:
1. Y. Bazel a kol.: Praktikum z analytickej chémie, PF UPJŠ, Košice 2019.
2. T. Gondová a kol.: Praktikum z analytickej chémie, PF UPJŠ, Košice 1999.
3. V. Szmereková, P.Meľuch: Praktikum z analytickej chémie, PF UPJŠ, Košice 1988.
4. J. Labuda a kol. Analytická chémia, STU, Bratislava 2014.
5. Z. Holzbecher a kol: Analytická chemie, SNTL, ALFA Praha 1987.

6. L. Koller: Analytická chémia, TU Košice, 2002, skriptum a v digitálnej forme.
7. 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: 473

A	B	C	D	E	FX
55.18	24.52	15.64	2.54	2.11	0.0

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

Date of last modification: 15.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/PFCH/03	**Course name:** Practical in Physical Chemistry

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:

Course level: I.

Prerequisities: ÚCHV/FCH1a/03 or ÚCHV/FCH1a/21

Conditions for course completion:
1. Adequate theoretical preparation for individual tasks of experimental practice according to the recommended literature.
2. Passing tasks with relevant results.
3. Processing of experimental work results in the form of a protocols and its acceptance.
4. Elaboration of a paper on a selected topic and its presentation.
5. Assessment of theoretical knowledges and practical skills.
<p>
In the case of distance learning:
1. Elaboration of a paper on a selected topic and its presentation.
2. Theoretical preparation in the form of protocols, where the basic principles of individual tasks are stated.
3. Teaching is realized in blocks without limiting the scope in the alternative term.

Learning outcomes:
Theoretical principles, description of each technique and appropriate physical chemistry experiments.

Brief outline of the course:
Experimental verification of theoretical knowledge on thermodynamics, thermochemistry, chemical equilibria (determination of enthalpy, phase diagrams), colligative properties (cryoscopy, ebulioscopy), adsorption.
Experimental verification of theoretical knowledge on electrochemistry (conductivity, dissociation constants, activity coefficients, electromotive force of galvanic cell, Daniell cell, potentials, polarography) and chemical kinetics (determination of rate constants).

Recommended literature:
B.P. Levitt: Findlay´s Practical Physical Chemistry, Longman, London 1973
W.J. Moore: Physical Chemistry, Longman, London 1972
P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002

Course language:

Notes:

Teaching is carried out in person. If a distance form is required, the conditions will be specified by the teacher.

Course assessment
Total number of assessed students: 464

A	B	C	D	E	FX
69.61	21.77	6.25	0.86	1.51	0.0

Provides: RNDr. František Kaľavský, RNDr. Radka Gorejová, PhD., RNDr. Jana Shepa, PhD.

Date of last modification: 22.07.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/PLCV/23	**Course name:** Prístrojové laboratórne cvičenie v praxi
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides:
Date of last modification: 18.12.2023
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/STN/23	**Course name:** STN normy výrobkov chemického priemyslu

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: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/CHV1/99

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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: doc. RNDr. Miroslav Almáši, PhD.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

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: 62

abs	n
9.68	90.32

Provides: Mgr. Agata Dorota Horbacz, PhD.

Date of last modification: 29.03.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SPPI/23	**Course name:** Semestrálny projekt z praxe I
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 0 / 1 **Per study period:** 0 / 14 **Course method:** present	
Number of ECTS credits: 1	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides:
Date of last modification: 18.12.2023
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SPPII/23	**Course name:** Semestrálny projekt z praxe II
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 0 / 2 **Per study period:** 0 / 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides:
Date of last modification: 18.12.2023
Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ASM/03	**Course name:** Separation 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:	
Course level: I.	
Prerequisities: (ÚCHV/ANCHU/03 or ÚCHV/ANCHU/21 or ÚCHV/ANCHE/09 or ÚCHV/ANCH1b/03 or ÚCHV/ANCH1b/21) and (ÚCHV/PAEC/03 or ÚCHV/PANCH/06 or ÚCHV/PANCHE/09 or ÚCHV/PACU/03)	
Conditions for course completion: 1. Preparation and presentation of a project focused on the application of separation methods. 2. Examination. The exam consists of 3 questions (each of 33%), 50% must be obtained for the pass exam.	
Learning outcomes: Survey of basic principles, theoretical background and applications of separation methods in research and analytical practice.	
Brief outline of the course: Basic principles, classification, theory and applications of separation methods. Extraction - LLE, SPE, SPME. Chromatographic methods - theory, classification. Gas chromatography, stationary phases. Instrumentation, detectors in GC. Data evaluation - qualitative and quantitative analysis. High-performance liquid chromatography, principles, classification. Stationary and mobile phases in LC, instrumentation. Applications. Planar chromatographic methods - TLC, HPTLC, PC. Electrophoretic techniques and their applications.	
Recommended literature: Skoog D. A., Leary J. J.: Principles of instrumental analysis. Saunders College Publishing, New York 1997. Pawliszyn J., Lord H. L.: Handbook of sample preparation, Wiley 2010. Current scientific literature	
Course language: Slovak, english language	
Notes:	

Course assessment
Total number of assessed students: 506

A	B	C	D	E	FX
28.66	26.09	25.1	12.65	5.34	2.17

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 01.08.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ASC1/99	**Course name:** Separation Methods Practicals

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 5 **Per study period:** 70
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚCHV/ASM/03

Conditions for course completion:
1.Take part in all exercises.
2. Assessment is based on active participation in all exercises according to the schedule and submitted protocols from individual tasks.

Learning outcomes:
To obtain practical experiences for applications of separation methods in analytical practice.

Brief outline of the course:
Application of gas chromatography, high-performance liquid chromatography and thin-layer chromatography methods in analysis. Application of electrophoretic methods. Spectrophotometric determination of selected analytes after extraction treatment of sample. Application of ion-exchange chromatography in analytical practice.

Recommended literature:
Skoog D. A., Leary J. J.: Principles of instrumental analysis. Saunders College Publishing, New York 1997.
Pawliszyn J., Lord H. L.: Handbook of sample preparation, Wiley 2010.
T.Gondová a kol.: Separation methods practicals - actual texts for exercises

Course language:

Notes:

Course assessment
Total number of assessed students: 146

A	B	C	D	E	FX
89.04	10.27	0.68	0.0	0.0	0.0

Provides: doc. RNDr. Taťána Gondová, CSc.

Date of last modification: 15.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

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: 15203

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
86.07	0.07	0.0	0.0	0.0	0.05	8.67	5.15

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

Date of last modification: 07.02.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

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

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

Brief outline of the course:
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: 13788

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
83.84	0.49	0.01	0.0	0.0	0.04	11.18	4.43

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

Date of last modification: 07.02.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

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: 9104

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.38	0.07	0.01	0.0	0.0	0.02	4.46	7.06

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

Date of last modification: 07.02.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

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: 5839

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
82.51	0.27	0.03	0.0	0.0	0.0	8.25	8.92

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

Date of last modification: 07.02.2024

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MUS/21	**Course name:** Structure determination - spectroscopic methods

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
1. Participation in exercises in accordance with the Study Rules of PF UPJŠ. 2. Successful execution of 3 control written works on exercises after 4., 8. and.12. weeks of teaching. Obtaining a minimum grade E from seminars. The test consists of: 1. Solution of 2 structures of unknown compounds on the basis of combined application of spectral methods. 2. Theoretical and practical questions. Percentage rating: 100-91% (A), 90-81% (B), 80-71% (C), 70-61% (D), 60-51% (E), 50% and less FX.

Learning outcomes:
Learn students fundamentals of molecular spectroscopy and magnetic properties study, as powerful tools for structure determination in chemistry. Ultraviolet, visible, infrared and Raman spectroscopy, mass spectrometry and methods based on magnetic resonance (1H NMR, 13C NMR).

Brief outline of the course:
Fundamentals of molecular spectroscopy, mass spectrometry and magnetic methods as powerful tools for structure determination in chemistry. Ultraviolet and visible spectroscopy. Emission spectroscopy. Symmetry and group theory. Infrared and Raman spectroscopy. Mass spectrometry in organic and analytical chemistry and biochemistry. Nuclear magnetic resonance - NMR. Chemical shift and splitting of signals by spin-spin coupling. Coupling constants. 1H NMR, 13C NMR, NMR of other nuclei. Two- and more dimensional NMR. NMR applications. Methods and instruments used for spectra measurements. Combined application of spectral methods for solution of chemical problems.

Recommended literature:
1. Kováč Š., Ilavský D., Leško J.: Spektrálne metódy v organickej chémii a technológii, ALFA, Bratislava, 1987.
2. Milata V., Segľa P.: Vybrané metódy molekulovej spektroskopie. STU BA, 2007.
3. Milata V., Segľa P.: Spektrálne metódy v chémii. STU FCHPT Bratislava 2002.
4. Miertuš S. a kol.: Atómová a molekulová spektroskopia, ALFA, Bratislava 1991.
5. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, 5. Ed., Elsevier, 2016.

Course language:

slovak

Notes:
In-person course, alternatively online course using the BigBlueButton tool or MS Teams.
The form of teaching is specified by the teacher at the beginning of the semester, 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. Ján Imrich, CSc., doc. RNDr. Juraj Kuchár, PhD., RNDr. Monika Tvrdoňová, PhD., RNDr. Zuzana Kudličková, PhD.

Date of last modification: 07.11.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/SVKA1/00	**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:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 14

abs	n
100.0	0.0

Provides: prof. RNDr. Juraj Černák, DrSc., prof. RNDr. Vladimír Zeleňák, DrSc., doc. RNDr. Miroslav Almáši, PhD., doc. RNDr. Ivan Potočňák, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Juraj Kuchár, PhD., RNDr. Martin Vavra, PhD.

Date of last modification: 08.09.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ LKSp/13	**Course name:** Summer Course-Rafting of TISA River

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

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: 232

abs	n
36.64	63.36

Provides: Mgr. Dávid Kaško, PhD.

Date of last modification: 29.03.2022

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

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: 459

abs	n
45.97	54.03

Provides: Mgr. Ladislav Kručanica, PhD.

Date of last modification: 16.05.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FTEP1/03	**Course name:** Theory of electrochemical processes

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: I., II.

Prerequisities:

Conditions for course completion:
1. Participation in seminars (also applies to the online form of teaching) and laboratory exercises. Students are required to attend seminars and laboratory exercises. The relevant teacher who leads the seminar or practical exercise will justify the student's justified non-participation (incapacity for work, family reasons, etc.) in a maximum of two seminars during the semester without the need for substitute performance. In the case of a longer-term justified absence (for example due to incapacity for work), the relevant teacher will assign the student an alternative form of mastering the missed material.
2. Activity at seminars and practical exercises. The preparation of students and their activity in seminars and exercises is always assessed by the relevant teacher who conducts the seminar or exercise, within his / her competence.
3. The exam is carried out in the form of a written test, resp. in case of restrictions of contact forms of the pedagogical process, the exam will be performed in a suitable distance - electronic form.
4. To successfully master the subject, it is necessary to prove mastery of the required curriculum at least 51%.

Learning outcomes:
To provide the students with knowledge on the basic theoretical principles, kinetics and mechanism of electrode and electrochemical processes and with selected experimental methods.

Brief outline of the course:
Fundamentals of electrochemical thermodynamics. Electrochemical potential and equilibrium at the electrode/solution interface. Electric double layer - fundamental models of the double layer structure. Adsorption phenomena at the electrode/solution interface. Fundamentals of electrochemical kinetics. Polarization curves and informations provided by them (charge transfer coefficient, heterogeneous rate constant). Influence of transport processes on electrode kinetics (convection, diffusion, migration). Reversibility of electrode reactions. Influence of the double layer structure on kinetics of electrode processes. Theory of electrolytic deposition.
Experimental methods for electrochemical kinetics (single pulse and multipulse potentiostatic methods, cyclic voltammetry with dc and dp scan, coulometry, chronopotentiometry). Spectroelectrochemistry. QCM

Recommended literature:

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

Course language:
Slovak language.

Notes:
Teaching is carried out in person or, if necessary, remotely using the bbb or MS Teams 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: 40

A	B	C	D	E	FX
75.0	15.0	5.0	0.0	5.0	0.0

Provides: prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Ján Macko, PhD.

Date of last modification: 12.11.2021

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ZMCHL/23	**Course name:** Základné metodiky v chemickom laboratóriu

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 0 / 6 **Per study period:** 0 / 84
Course method: present

Number of ECTS credits: 6

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides: doc. RNDr. Miroslav Almáši, PhD., Mgr. Michaela Rendošová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Slávka Hamuľaková, PhD., univerzitná docentka, prof. RNDr. Renáta Oriňaková, DrSc., Mgr. Gabriela Kuzderová, RNDr. Jana Šandrejová, PhD., univerzitná docentka

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ZCHI/23	**Course name:** Základy chemického inžinierstva

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course 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: Ing. RNDr. Andrea Džubinská, PhD.

Date of last modification: 18.12.2023

Approved: RNDr. Zuzana Kudličková, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Miroslava Matiková Maľarová, PhD., RNDr. Martin Vavra, PhD., RNDr. Jana Špaková Raschmanová, PhD., Ing. RNDr. Andrea Džubinská, PhD.