CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/BAP/15	**Course name:** Advanced Practical from Coordination and Bioinorganic Chemistry

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: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Gaining practical skills using advanced methods in the characterization of prepared coordination compounds. The credit evaluation of the subject takes into account the following student workload: direct teaching 2 credits, elaboration of a protocol - 2 credits. The minimum limit for obtaining the evaluation is the active completion of all practical exercises in accordance with the study regulations and the submission of all protocols. 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:
The student will obtain skills and knowledge of modern methods of characterization and study of physico-chemical properties of new inorganic and coordination compounds with a focus on the bio-inorganic field. The acquired skills will also include methods for identifying biologically important elements in the mentioned materials.

Brief outline of the course:
Preparation of coordination compounds as model receptors imitating molecules of biological significance.
Study of SOD mimetic activity of prepared complexes by UV-VIS spectroscopy.
Photometric determination of biologically important metals (Fe, Cu, Ca, Na, K, Mg) and other bioelements (Cl, P) in a model biological sample.
Determination of ions in selected mineral waters by means of ion-selective electrodes and potentiometry.
Potentiometric determination of protonation constants of binary bio metal systems: amino acid.

Recommended literature:
M. Almáši, Z. Vargová, V. Zeleňák, M. Ganajová, Pokročilé praktikum z anorganickej, koordinačnej a bioanorganickej chémie, UPJŠ, Košice, 2017

Course language:
SK - slovak

Notes:
Teaching is carried out in person in a practical laboratory. Teaching is carried out in person on a weekly basis at a set time according to the schedule, or in blocks if necessary (several exercises

per week). 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: 50

A	B	C	D	E	FX
82.0	12.0	6.0	0.0	0.0	0.0

Provides: prof. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Miroslav Almáši, PhD.

Date of last modification: 15.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

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

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

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

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

Course language:
Slovak

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

Course assessment
Total number of assessed students: 124

A	B	C	D	E	FX
35.48	37.9	16.13	9.68	0.81	0.0

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 25.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BCM/04	**Course name:** Biochemistry of Microorganisms

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

Number of ECTS credits: 6

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

Course level: II.

Prerequisities:

Conditions for course completion:
2 tests
test

Learning outcomes:
The aim of biochemistry of microorgamism teaching is to acquire knowledge in the field of microorganisms.

Brief outline of the course:
Structure and physiology of microorganisms; microbial nutrition, growth and control; microbial molecular biology and genetics; medical microbiology; immunology and applied microbiology; microbial diseases and their control.

Recommended literature:
McCall D., Stock D., Achrey P., Introduction to Microbiology, Blackwell Science, USA, 2001
Willey, J.M., Sherwood L.M., Woolverton C.J., Prescott, Harley, and Klein´s Microbiology, McGraw-Hill Int. Ed., USA, 2008
Black J.G., Microbiology, John Wiley and Sons, USA, 2008

Course language:

Notes:

Course assessment
Total number of assessed students: 183

A	B	C	D	E	FX
49.18	25.68	17.49	7.1	0.55	0.0

Provides: prof. RNDr. Mária Kožurková, CSc.

Date of last modification: 11.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/BACM/22	**Course name:** Bioinorganic Chemistry

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities: ÚCHV/BAC1/04 and ÚCHV/BAC2/05

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 3

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

Provides:

Date of last modification: 14.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

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: 1., 3.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Test or seminar works
examination

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 373

A	B	C	D	E	FX
42.36	27.61	19.03	5.9	4.83	0.27

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

Date of last modification: 28.10.2021
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/BAC2/22	**Course name:** Bioinorganic Chemistry II

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚCHV/BAC1/04

Conditions for course completion:

Learning outcomes:
Goal of the course is to provide the students with a knowledge of biocoordination compounds and their physicochemical properties, biological efficiency of some coordination compounds with transition elements (Zn, Fe, Co, Mn, Cu).

Brief outline of the course:
Goal of the course is to provide the students with a knowledge of biocoordination compounds and their physicochemical properties, biological efficiency of some coordination compounds with transition elements (Zn, Fe, Co, Mn, Cu).

Recommended literature:
Kendrick J. M., May M. T., Plishka M. J., Robinson K. D.: Metals in biological systems, Ellis Horwood, New York,1992.
Kaim, W., Schwederski, B.: Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, John Wiley and Sons, Chichester 1994.

Course language:

Notes:

Course assessment
Total number of assessed students: 3

A	B	C	D	E	FX
66.67	33.33	0.0	0.0	0.0	0.0

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

Date of last modification: 19.08.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/BOC/18	**Course name:** Bioorganic Chemistry

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
1. Individual work and activity in seminars.
2. Passing a written exam with a success rate of min. 51%.

Learning outcomes:
Metodology of organic chemistry used to understanding of processes in living forms. Mechanism of the basic biochemical processes including proteosynthesis, enzymatic catalysis, nucleic acid chemistry, photosynthesis.

Brief outline of the course:

Recommended literature:
H. Dugas: Bioorganic Chemistry, Wiley, London 1995.

Course language:
Slovak language

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

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
53.57	28.57	3.57	14.29	0.0	0.0

Provides: doc. RNDr. Ladislav Janovec, PhD., RNDr. Jana Špaková Raschmanová, PhD.

Date of last modification: 21.12.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHE2/03	**Course name:** Chemical Excursion

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

Number of ECTS credits: 4

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 109

A	B	C	D	E	FX
87.16	12.84	0.0	0.0	0.0	0.0

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

Date of last modification: 28.10.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ TOX1/03	**Course name:** Chemical Toxicology

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Goal of the course is to provide the students with a knowledge of toxic substances and their toxic effect, interactions between chemicals and biological systems.
Special Toxicology: Knowledge of toxicological properties of elements, inorganic and organic compounds with a focus on the environment and human protection when exposed to toxic chemicals.
Legislation: The knowledges about the risks of working with chemical substances, Decree Regulation of the Government of the Slovak Republic on poisons and other harmful substances. European directives on health and environmental protection as well as a directive specifying the classification, labeling and packaging of chemicals

Brief outline of the course:
Historical aspects, types of toxic substances, dose-response relationship. Disposition of toxic compounds (absorption, distribution, excretion, metabolism of toxic compounds, factors affecting toxic responses). Types of exposure and response. Drugs as toxic substances. Industrial toxicology. Food additives and contaminants. Pesticides. Environmental pollutants. Natural products. Risk and safety practices with chemical substances, designation of substances in accordance of norm of European Union and order of Government of Slovak Republic.

Recommended literature:
J. A. Timbrell: Introduction to Toxicology, Taylor and Francis, London 1989
V. E. Forbes, T. L. Forbes: Toxicology in Theory and Practice, Chapmane Hall, London 1994
H. M. Stahr: Analytical Methods in Toxicology, John Wiley & Sons, New York 1991
J.H.Duffus, H.G.J. Worth: Fundamental toxicology, RSC Publishing, Cambridge, 2006.
J. Horák, I.Linhart, P.Klusoň, Uvod do toxikologie a ekologie pro chemiky, 2004.

Course language:

Notes:

Course assessment
Total number of assessed students: 56

A	B	C	D	E	FX
26.79	30.36	23.21	12.5	3.57	3.57

Provides: RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D.

Date of last modification: 22.07.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CNM/22	**Course name:** Chemistry of nanomaterials

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

Number of ECTS credits: 4

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:
The course is standardly realized in full-time form, in case of necessary circumstances by distance.

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
66.67	33.33	0.0	0.0	0.0	0.0

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 14.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

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

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

Brief outline of the course:

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

Course language:
Slovak, english.

Notes:

Course assessment
Total number of assessed students: 223

abs	n
99.1	0.9

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

PhD., prof. RNDr. Mária Kožurková, CSc., doc. RNDr. Viktor Víglaský, PhD., RNDr. Nataša Tomášková, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, prof. RNDr. Erik Sedlák, DrSc.
Date of last modification: 25.01.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Evaluation:
A condition for student evaluation is his active participation in the seminar. It is expected that the student will actively participate in the discussions and will express their positions and possible solutions.
The output for evaluation will be the development of a project in the form of a Power Point presentation or a video on a selected communication topic.

Learning outcomes:
The goal of the subject Communication, cooperation is the formation and development of students' language and communication skills through experiential activities.
The student can demonstrate an understanding of individual behavior in various communication contexts.
The student can describe, explain and evaluate communication techniques (cooperation, assertiveness, empathy, negotiation, persuasion) in practical contexts.
The student can apply these techniques in common communication schemes.

Brief outline of the course:
Communication
Communication theory
Non-verbal communication and its means
Verbal communication (basic components of communication, language means of communication) about active listening
Empathy
Short conversation and effective communication (principles and principles of effective communication)
Cooperation
About the basics of cooperation
About types, signs, types and factors of cooperation
Characteristics of the team (positions in the team)
Small social group (structure, development, characteristics of a small social group, position of the individual in the group)

About leadership (characteristics of the leader, management, leadership styles)

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 281

abs	n	z
98.22	1.78	0.0

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

Date of last modification: 31.07.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VMS1/03	**Course name:** Computing Methods in X-Ray Structure Analysis

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚCHV/STA1/03

Conditions for course completion:
Semester project - student has to solve and describe a crystal structure of unknown sample.

Learning outcomes:
Crystal structure analysis of simple samples, tabular and graphical processing of the results.

Brief outline of the course:
Practical course of crystal structures solution for substances with the number of atoms less than 200 since the data processing to publishing structures: selection of the correct space group and generate the necessary files for the structure solution (Wingx); search for the model of the structure (SHELX and SUPERFLIP), refinement of the model (SHELX); graphical representation of the structure (DIAMOND); calculations of bond lengths, angles and hydrogen bonds (PARST); tabulation of the results of crystal structure analysis, obtaining the necessary data for similar structures from the Cambridge Structural Database System. Processing of results of powder diffraction technique, modeling of powder diffraction patterns (MERCURY).

Recommended literature:
Manuals for the programs.

Course language:
Slovak and English

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: 78

A	B	C	D	E	FX
83.33	8.97	2.56	5.13	0.0	0.0

Provides: doc. RNDr. Ivan Potočňák, PhD.

Date of last modification: 21.07.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/KCH/14	**Course name:** Coordination Chemistry

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities: ÚCHV/KCH1/00 and ÚCHV/VKA/04

Conditions for course completion:
Successful verbal answer before the commission for state final exams. Alternatively, the state exam may be performed in a convenient online form.

Learning outcomes:
The student's verbal answer is evaluated and the evaluation is given after a closed consultation of the commission.

Brief outline of the course:

Recommended literature:
Recommended literature for the conditional subjects of the state exam.

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 40

A	B	C	D	E	FX
72.5	22.5	2.5	0.0	2.5	0.0

Provides:

Date of last modification: 25.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ KCH1/00	**Course name:** Coordination Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
1. Students are required to attend seminars (this also applies to the online form of teaching). 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 event of a longer-term justified absence (for example due to ilness), 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. The exam is usually carried out in writing form at the end of the semester with the possibility of oral examinations, respectively. in case of restrictions of contact forms of the pedagogical process, the exam will be performed in a appropriate on-line - electronic form.
4. To successfully complete the course, it is necessary to obtain at least 51% of the maximum number of points in the final test.
Credit evaluation of the course takes into account the following student workload: direct teaching (2 hours of lectures and 1 hour of exercises) and self-study of recommended literature - 3 credits, elaboration of a ppt project - 1 credit, preparation for the exam - 1 credit.
The minimum limit for obtaining the evaluation is successful completion of the final exam and elaboration of a ppt presentation according to the assignment.

Learning outcomes:
The student aquires knowledge on the coordination compounds, preparation, isomerism and properties of coordination compounds as well as about the chemical bonding in coordination compounds.

Brief outline of the course:
1. Definition and nomenclature of coordination compounds.
2. Central atom and ligands
3. Coordination numbers, coordination polyhedra.
4. Isomerism of coordination compounds
5. Preparation of coordination compounds
6. Stability of coordination compounds

7. Chemical bonding in coordination compounds.

Recommended literature:
J. Ribas: Coordination Chemistry, Wiley-VCH, Weinheim, 2008.
J. C. Huheey, E. A. Keiter, R. L. Keiter: Inorganic Chemistry, Haper Collins, New York, 1993.
G. A. Lawrance: Introduction to Coordination Chemistry, Wiley, 2010.

Course language:

Notes:

Course assessment
Total number of assessed students: 127

A	B	C	D	E	FX
51.97	18.9	16.54	6.3	5.51	0.79

Provides: prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.

Date of last modification: 19.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 16

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX
70.83	25.0	4.17	0.0	0.0	0.0

Provides:

Date of last modification: 14.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

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: 2.

Course level: 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: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ HGS/15	**Course name:** Host-Guest and Supramolecular Systems

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

Number of ECTS credits: 3

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Clathate, inclusion compound, supramolecular systems. Water clathates, clathrates of urea and thiourea, Hofmann type clathates and its analogs, Werner-type clathtaes, calixarenes, crown-ethers, cryptates, possibilities of their practical use. From molecular to supramolecular chemistry, types and importance of weak interactions in supramolecular chemistry, crystal engineering.

Recommended literature:
Beer P.D., Gale P.A., Smith D.K.: Supramolecular Chemistry, Oxford University Press, Oxford, 2003.
J.W. Steed, J.L. Atwood: Supramolecular chemistry, Wiley 2000.

Course language:

Notes:

Course assessment
Total number of assessed students: 25

A	B	C	D	E	FX
52.0	24.0	16.0	4.0	4.0	0.0

Provides: prof. RNDr. Juraj Černák, DrSc., RNDr. Miroslava Matiková Maľarová, PhD.

Date of last modification: 19.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

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: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
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: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/AKO/15	**Course name:** Inorganic Polymers, Clusters and Organometallics

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Definition and classification of inorganic polymers. Linear polymers S, Se, Te, (SN)x. Chalkogenic glasses, BN, borate glasses. Quartz and silicate glasses. Crystalline silicates and aluminosilicates. Boranes and heteroboranes, polyoxovanadium compounds. Hetero and isopolyanions. Polymeric cyanocomplexes.
Cluster compounds, metal-metal bonding in clusters, intersticial atoms.
Organometallic compounds, bondings M-C, typs of ligands, preparatin and their propereties.

Recommended literature:
Ray, N.H.: Inorganic Polymers, Academic Press, New York, 1978.
Haiduc I., Zuckerman J.J.: Basic Organometallic Chemistry, W. de Gruyter, Berlin, N.Y. 1985.
Gupta, B.D., Elias, A.J.: Basic Organometallic Chemistry, CRC Press, Taylor and Francis group, Hyderabad (India), 2010.
Chandrasekhar, V.: Inorganic and Organometallic Polymers, Springer, Berlin, 2005.
Archer, R.D.: Inorganic and Organometallic Polymers, Wiley, New York, 2001.
Greenwood, N.N., Earnshaw, A.: Chemie prvku I a II, Informatorium, Praha, 1993

Course language:

Notes:

Course assessment
Total number of assessed students: 23

A	B	C	D	E	FX
26.09	26.09	8.7	30.43	8.7	0.0

Provides: RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Juraj Černák, DrSc.

Date of last modification: 19.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MAG/03	**Course name:** Magnetochemistry

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Continuous active acquisition of the subject is required during the course of Magnetochemistry, which is necessary for independent mastery of individual tasks in self-study and in solving specific homework assignments. During the semester, the student will get a theoretical project based on the study of foreign journal literature (understanding of a specific scientific article and based on it the elaboration and presentation). Another condition for completing the course is active participation in lectures and seminars. In the exercises, the student will get a concrete idea of how the experimental data are analyzed. Subsequently, the student independently analyzes the experimental data of the selected magnetic compound in the frame of two to three home projects and presents the results of the analysis at a joint meeting. Another condition for obtaining credits is successful completion of the exam from the theoretical part in the form of an extensive oral discussion, where the student demonstrates understanding of basic concepts and relationships between them, finding connections and understanding the course as a coherent whole logically built on the basis of gradual incorporation of individual interactions. The minimum threshold for passing the course is successful completion of self-study projects and individual assignments during the semester and mastering the final oral exam by more than 50 percent.
Credit evaluation takes into account the scope of direct teaching (2 credits), self-study of recommended literature and preparation of presentation (1 credit) elaboration of home assignments (1 credit), consultations and evaluation (1 credit)

Learning outcomes:
Introduction to the basic interactions in the electron subsystem of insulators, demonstration of the correlations between the structure and magnetic properties. Students will learn the basic standard methods used in the analysis of thermodynamic data (specific heat, susceptibility, magnetization) and EPR, since the study of magnetic properties yield an important information about the structure of material especially at low temperatures.

Brief outline of the course:
Bohr model of atom. Hydrogen atom. Paramagnetic and diamagnetic atoms. Atom in magnetic field. Specific heat, susceptibility, magnetization and electron paramagnetic resonance (EPR) in the paramagnets. Atom in the crystal field. Spin Hamiltonian. Thermodynamics and EPR of paramagnetic atoms in the crystal field. Exchange and dipole interaction. Heisenberg Hamiltonian.

Magnetic dimer. Long-range and short- range order. Low-dimensional magnets. Spatial anisotropy of exchange coupling. Exchange anisotropy. Heisenber, Ising and XY model.

Recommended literature:

1. R.L. Carlin, A.J. Duyneveldt: Magnetic properties of transition metal compounds. New York, inc. Springer Verlag, 1977.
2. A.P.P. Lever: Inorganic electronic spectroscopy, Elsevier, Amsterdam, 1987.
3. J.-P. Launay, M. Verdaguer, Electrons in Molecules, Oxford 2018.

Course language:

english language

Notes:

The course Magnetochemistry is realized in the attendance form. In some special cases (as was pandemics of Covid) the teaching is realized online using software MS Teams, which enables to keep the contact with students and to keep the level and quality of the course.

Course assessment

Total number of assessed students: 28

A	B	C	D	E	FX
42.86	25.0	17.86	14.29	0.0	0.0

Provides: doc. RNDr. Alžbeta Orendáčová, DrSc.

Date of last modification: 19.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MAB/15	**Course name:** Mechanisms of Inorganic Reactions

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
two written tests

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 29

A	B	C	D	E	FX
51.72	17.24	27.59	3.45	0.0	0.0

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

Date of last modification: 28.10.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ FMCH/18	**Course name:** Medicinal Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Written seminar paper and its presentation.
One written test 50 pts. A minimum of 26 points must be obtained in test.
Written exam 50 pts. A minimum of 26 points must be obtained in 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:
Explanation of basic principles in the research and development of chemical drugs, 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:
1. Introduction, classification of drugs
2. Factors influencing design and activity of drugs of the third generation
3. Drug chirality
4. Search for new drugs, structure-activity relationships
5., 6. Chemotherapeutics of central, peripheral and vegetative nervous system
7. Antibacterial compounds
8. Antitumor compounds
9. Antiviral compounds
10. Antitussives and expectorants
11. Disinfectants
12. Excretory and digestive system drugs

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. Gareth T.: 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: 33

A	B	C	D	E	FX
48.48	33.33	9.09	6.06	3.03	0.0

Provides: RNDr. Mariana Budovská, PhD., univerzitná docentka

Date of last modification: 21.12.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

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

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

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

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

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 6

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

Provides: prof. PhDr. Eugen Andreanský, PhD.

Date of last modification: 01.02.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ JCH1/04	**Course name:** Nuclear Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:
Realization of practical exercises, without absence.
Elaboration of a project on a selected topic and its presentation.
Examination, each question must be answered at least 50%.

Learning outcomes:
Study of natural and artificial radioactivity, acquaintance with nuclear quantities and nuclear reactions. Gaining new knowledge about the preparation of radionuclides and labeled compounds and their use in technical practice and in general and physical chemistry. Overview of biological effects of nuclear radiation and practical use of nuclear medicine and nuclear chemistry in healthcare.

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

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

Course language:

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: 63

A	B	C	D	E	FX
44.44	30.16	14.29	6.35	3.17	1.59

Provides: RNDr. Andrea Morovská Turoňová, PhD., RNDr. František Kaľavský, doc. RNDr. Andrea Straková Fedorková, PhD., RNDr. Jana Shepa, PhD.

Date of last modification: 24.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ OS/03	**Course name:** Organic synthesis

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
Midterm exam.
Presentation of a multistep synthesis.
Final written exam, student have to receive min. 51%.
A: 91-100b, B: 81-90b, C: 71-80b, D: 61-70b, E: 51-60b, FX: 0-50b.

Learning outcomes:
The aim is to become familiar with the most important methods for the synthesis of organic compounds, their combination and application in the synthesis of complex molecules.

Brief outline of the course:
Retrosynthetic analysis of organic compounds and synthesis planning. Building of a carbon backbone using organometallic compounds and enolates. Reactions resulting in creation of multiple bonds. Synthesis of cyclic molecules. Synthesis of halogenderivatives, oxygen containing organic molecules, nitrogen derivatives. Protecting groups and special synthetic techniques. Synthesis of complex molecules and natural products.

Recommended literature:
Carruthers W., Coldham I.: Modern Methods of Organic Synthesis, Fourth Edition, Cambridge University Press, 2005.
Hanson, J. R.: Organic Synthetic Methods, The Royal Society of Chemistry 2002.
Wyatt P., Warren S.: Organic Synthesis: Strategy and Control, John Wiley & Sons 2007.

Course language:
english

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

Course assessment
Total number of assessed students: 184

A	B	C	D	E	FX
56.52	28.26	10.33	2.72	2.17	0.0

Provides: RNDr. Ján Elečko, PhD.

Date of last modification: 28.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/FAK1a/07	**Course name:** Pharmacology I

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

Number of ECTS credits: 4

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

Course level: II.

Prerequisities: ÚCHV/FMCH/04

Conditions for course completion:
Two tests, in 7th and 14th week. Test max 50 points. A student must obtain at least 51% of points from each test. Writing of the tests is mandatory.
Written exam, 100 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:
To provide students with a comprehensive introduction to the fundamental Pharmacology and uses of the major classes of drugs currently used in medical practice. To master the scientific methods of pharmacology, to be able to apply in a creative way to solve a wide range of problems in the field of human sciences as part of living nature.

Brief outline of the course:
Basic pharmacology (pharmacokinetic and pharmacodynamic principles), factors influencing drug effects, routes of drug application. Basic knowledge about the major classes of drugs currently used in medical practice.

Recommended literature:
1. Whalen, K. et al.: Lippincott Illustrated Reviews: Pharmacology 7th edition, 2019.
2. Ritter, J. M. et al.: Rang & Dale's Pharmacology, 2019.

Course language:
english

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

Course assessment
Total number of assessed students: 12

abs	n
100.0	0.0

Provides: prof. MVDr. Ján Mojžiš, DrSc., prof. MUDr. Ladislav Mirossay, DrSc., doc. MVDr. Martina Bago Pilátová, PhD.
Date of last modification: 11.01.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/FAK1b/07	**Course name:** Pharmacology II

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities: ÚCHV/FAK1a/07

Conditions for course completion:
Two tests, in 7th and 14th week. Test max 50 points. A student must obtain at least 51% of points from each test. Writing of the tests is mandatory.
Written exam, 100 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:
To provide students with a comprehensive introduction to the fundamental Pharmacology and uses of the major classes of drugs currently used in medical practice. To master the scientific methods of pharmacology, to be able to apply in a creative way to solve a wide range of problems in the field of human sciences as part of living nature.

Brief outline of the course:
Basic knowledge about the major classes of drugs currently used in medical practice.
Detailed knowledge about drugs used to treat cancer diseases

Recommended literature:
1. Whalen, K. et al.: Lippincott Illustrated Reviews: Pharmacology 7th edition, 2019.
2. Ritter, J. M . et al.: Rang & Dale's Pharmacology, 2019.

Course language:
english

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

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
0.0	11.11	33.33	11.11	44.44	0.0

Provides: prof. MVDr. Ján Mojžiš, DrSc., prof. MUDr. Ladislav Mirossay, DrSc., doc. MVDr. Martina Bago Pilátová, PhD.
Date of last modification: 11.01.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ FILA/22	**Course name:** Philosophical Antropology

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

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

Provides: doc. PhDr. Kristína Bosáková, PhD.

Date of last modification: 01.02.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ADP/03	**Course name:** Porous materials and their applications

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: I., II., III.

Prerequisities:

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

Learning outcomes:
To make the acquaintance of various types of advanced porous solids and basic methods for their investigation. To gen up the students with the methods used in characterisation of specific surface area and pore size of different types of porous materials.

Brief outline of the course:
Terminology and principal terms associated with powders, porous solids and adsorption. Methodology of adsorption at the gas-solid interface, liquid-solid interface. Assessment of surface area and porosity. Inorganic materials (active carbon, metal oxides, zeolites, clay minerals, new advanced materials) and phenomenon of adsorption. Application in the industry and everyday life.

Recommended literature:
1. F. Rouquerol, J. Rouquerol, K. Sing: Adsorption by powders and porous solids, Academic press, London, UK, 1999
2. S. J. Gregg, K.S.W. Sing: Adsorption, surface area and porosity, Academic Press, London,, UK, 1982.
3. V. Zeleňák: Adsorption and porosity of solid substances, internal study text, PF UPJŠ, 2020.

Course language:

Notes:
The course is standardly realized in full-time form, in case of necessary circumstances by distance.

Course assessment
Total number of assessed students: 100

A	B	C	D	E	FX	N	P
77.0	10.0	4.0	0.0	0.0	0.0	0.0	9.0

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 21.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
The examination can consist of written and/or oral examination as the examiner may determine. In order to pass this course, each student must complete ALL of the following compulsory requirements: Students may only miss 1 practise session. Students must obtain at least 51 percent of the total number of points of the written examination. The final evaluation is assigned on the basis of the mark of the written examination. 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.

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

Brief outline of the course:
Historical overview of quantum mechanics. Operators in quantum mechanics. Axioms of quantum mechanics. Introduction to the theory of chemical bonding. Time-independent Schrodinger equation. Induction and formulation of the Schrodinger equation for a particle in a one-dimensional potential well and in a simple harmonic motion. Induction of the Schrodinger equation for a hydrogen atom and a molecular hydrogen ion. Examples of solving the Schrodinger equation for a free particle and a particle in a potential well, and its consequences. Examples of solutions of the Schodinger equation for harmonic oscillator, rigid rotor and hydrogen atom. Electron spin. Approximate methods for solving the Schrodinger equation. Multielectron atoms and Pauli's principle. Hartree and Hartree-Fock method. Periodic law from the point of view of quantum theory. Quantum theory of molecules. Basic approximations in the theory of chemical bonding. Movement of atoms in molecules. Electronic structure of molecules. Ab initio methods. Density functional theory. Semiempirical approach. Properties of molecules. Intermolecular interactions. Modeling of liquid phase and solutions. Electronic exit states. Chemical reactivity. Relativistic effects. Quantum chemistry in practice.

Recommended literature:
1. Zahradník R., Polák R.: Základy kvantové chemie, TKI, SNTL Praha 1976
2. Polák R., Zahradník R.: Kvantová chemie, SNTL Praha 1985
3. Remko M.: Molekulové modelovanie, SAP, Bratislava 2000

4. Jensen F. : Introduction to Computational Chemistry, Wiley, 2000
5. Kvantová chemie: První čtení. Petr Slavíček, Eva Muchová, Daniel Hollas, Vít Svoboda, Ondřej Svoboda. VSCHT Praha 2014 - 2019.

Course language:
slovak language and english language

Notes:
Teaching is carried out in person or, if necessary, online using the MS Teams platform. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously. Teaching will take place if at least 5 students are enrolled in the course.

Course assessment
Total number of assessed students: 32

A	B	C	D	E	FX
81.25	15.63	3.13	0.0	0.0	0.0

Provides: doc. RNDr. Ladislav Janovec, PhD.

Date of last modification: 11.08.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

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: 54

abs	n
11.11	88.89

Provides: Mgr. Agata Dorota Horbacz, PhD.

Date of last modification: 29.03.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ VKA/04	**Course name:** Selected Topics in Inorganic Chemistry

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:
1. Attendance at seminars is mandatory (this also applies to the online form of teaching). 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. At the seminar, the teacher assigns students a written assignment, which they develop based on the results of their own literary research. Successful completion of the seminar is considered if the student submits the completed assignment. Successful completion of the seminar is a condition for the exam.
4. The examination is usually carried out in writing with the possibility of oral examination, 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 course, it is necessary to obtain at least 51% of the maximum number of points in the written form of the exam

Learning outcomes:
To deepen students' knowledge and understanding in the field of systematic inorganic chemistry with a focus on coordination chemistry and organometals, as well as in inorganic materials based on current research results of the department teachers, lead to independent thinking and finding connections between properties and structure in inorganic chemistry.

Brief outline of the course:
Selected aspects of non-metallic elements as donor atoms in coordination compounds and organometals.
Chemistry of 3d, 4d and 5d elements as central atoms in coordination compounds and organometals.
Chemistry of lanthanides as central atoms in coordination compounds and organometals.
Chemistry of selected non-transition metals as central atoms in coordination compounds and organometals.

Selected aspects of some types of coordination compounds:
Cu-Zn heterobimetallic compounds,
zinc complexes with bioactive ligands,
pentacoordinated Cu (II) compounds,
cyanido complexes of 3d elements,
pseudohalide complexes.
Selected aspects of some inorganic materials:
nanoparticles based on TiO2,
silicon and MOF formation,
materials based on inclusion compounds.

Recommended literature:

1. Greenwood, N.N., Earnshaw, A.: Chemistry of the elements I and II, Pergamon Press N.Y., 1993
2. J. E. Huheey, E.A. Keiter, R.L. Keiter: Inorganic Chemistry: Principles of Structure and Reactivity (4th Edition, Addison-Wesley Pub Co, 4th edition,1997.
3. Individual study of scientific papers found by own search in the databases.

Course language:
Slovak language, English language

Notes:

Course assessment
Total number of assessed students: 245

A	B	C	D	E	FX
44.08	29.39	15.92	6.53	4.08	0.0

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

Date of last modification: 25.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KF/ FIVYC/22	**Course name:** Selected Topics in Philosophy of Education (General Introduction)
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 1 / 1 **Per study period:** 14 / 14 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 2

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

Provides: PhDr. Dušan Hruška, PhD.
Date of last modification: 27.04.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

Course assessment
Total number of assessed students: 231

abs	n
99.57	0.43

Provides: RNDr. Rastislav Serbin, PhD., prof. RNDr. Mária Kožurková, CSc., prof. Dr. Yaroslav Bazeľ, DrSc., doc. RNDr. Ján Imrich, CSc., doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, prof. RNDr. Erik Sedlák, DrSc., RNDr. Nataša Tomášková, PhD., doc. RNDr. Viktor Víglaský, PhD., doc. RNDr. Rastislav Varhač, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, RNDr. Jana Šandrejová, PhD., univerzitná docentka, doc. RNDr. Ivan Potočňák, PhD., RNDr. Marián Fabián, CSc., doc. RNDr. Miroslav Almáši, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., RNDr. Martin Vavra, PhD., prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD., prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 24.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SP2/14	**Course name:** Semestral Project II
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Based on the information obtained from the subject Semester Project I, theoretical preparation of experimental works in the laboratory and their realization according to the instructions of the teacher. The condition for successful completion is realization of the assigned experiments and their evaluation in the form of presentation. After the implementation of experiments, successful presentation of results and answering any comments, the teacher will give the evaluation "completed".	
Learning outcomes: Mastering independent and creative work concerning the preparation and implementation of scientific experiments in the laboratory on the basis of the assigned topic and the ability to present the results.	
Brief outline of the course: Design of experimental work based on the study of the original literature, taking into account the rules of safety at work and laboratory equipment. Design of experimental work based on the study of the original literature, taking into account the rules of safety at work and laboratory equipment. Realization of the experiment. Critical evaluation of the obtained results and their processing into the form of presentation. Presentation of results.	
Recommended literature: Literature as recommendation by the teacher. Current papers.	
Course language: Slovak, English.	
Notes:	

Course assessment
Total number of assessed students: 158

abs	n
100.0	0.0

Provides: RNDr. Rastislav Serbin, PhD., prof. RNDr. Mária Kožurková, CSc., prof. Mgr. Vasiľ Andruch, DSc., prof. Dr. Yaroslav Bazeľ, DrSc., prof. RNDr. Erik Sedlák, DrSc., doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka, doc. RNDr. Andrea Straková Fedorková, PhD., RNDr. Monika Tvrdoňová, PhD., doc. RNDr. Mária Ganajová, CSc., RNDr. Martin Vavra, PhD., prof. RNDr. Jozef Gonda, DrSc., doc. Ing. Viera Vojteková, PhD., prof. RNDr. Vladimír Zeleňák, DrSc., doc. RNDr. Ján Imrich, CSc., doc. RNDr. Ivan Potočňák, PhD., doc. RNDr. Katarína Reiffová, PhD., RNDr. Nataša Tomášková, PhD., doc. RNDr. Viktor Víglaský, PhD., RNDr. Danica Sabolová, PhD., univerzitná docentka, doc. RNDr. Rastislav Varhač, PhD., doc. RNDr. Peter Pristaš, CSc., RNDr. Jana Šandrejová, PhD., univerzitná docentka, doc. RNDr. Miroslav Almáši, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D., prof. RNDr. Juraj Černák, DrSc., doc. RNDr. Juraj Kuchár, PhD.

Date of last modification: 25.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ NPC1a/00	**Course name:** Seminar from Advanced Inorganic Chemistry

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

Number of ECTS credits: 1

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
The student is obliged to attend all seminars in the given semester, which take place in person or remotely (via BBB or MS Teams), depending on the pandemic situation. The seminars also include lectures by domestic and external lecturers.
From each seminar, resp. lecture the student submits a one-page summary.
The student receives the evaluation on the basis of participation in lectures, activity (manifested, for example, by asking questions on the topic) and the quality of the summaries prepared.
In case of non-participation for serious reasons, compensation is possible in agreement with the teacher.

Learning outcomes:
To get acquainted with the current state of academic, resp. applied research in the field of inorganic chemistry both in Slovakia and abroad. The added value is to gain an overview of the possibilities of future employment in the field of inorganic chemistry after graduation and the possible possibility of establishing new working contacts.

Brief outline of the course:
Current research topics in the field of inorganic chemistry, organometals, bioinorganic chemistry, materials chemistry and used study methods enriched with industrial application possibilities.

Recommended literature:
Actual scientific papers and literature concerning the actual research topics in inorganic chemistry.
Shriver D.F. Shriver, Atkins P.W.: Inorganic Chemistry. Oxford University Press, Oxford 1999.

Course language:
Slovak language, English language

Notes:

Course assessment
Total number of assessed students: 83

A	B	C	D	E	FX
81.93	12.05	6.02	0.0	0.0	0.0

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

Date of last modification: 27.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ NPC2/02	**Course name:** Seminar from Advanced Inorganic Chemistry
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 1 **Per study period:** 14 **Course method:** present	
Number of ECTS credits: 1	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion: The student is obliged to attend all seminars in the given semester, which take place in person or remotely (via BBB or MS Teams), depending on the pandemic situation. The seminars also include lectures by domestic and external lecturers. From each seminar, resp. lecture the student submits a one-page summary. The student receives the evaluation on the basis of participation in lectures, activity (manifested, for example, by asking questions on the topic) and the quality of the summaries prepared. In case of non-participation for serious reasons, compensation is possible in agreement with the teacher.	
Learning outcomes: To get acquainted with the current state of academic, resp. applied research in the field of inorganic chemistry both in Slovakia and abroad. The added value is to gain an overview of the possibilities of future employment in the field of inorganic chemistry after graduation and the possible possibility of establishing new working contacts.	
Brief outline of the course: Current research topics in the field of inorganic chemistry, organometals, bioinorganic chemistry, materials chemistry and used study methods enriched with industrial application possibilities.	
Recommended literature: Actual scientific papers and literature concerning the actual research topics in inorganic chemistry. Shriver D. F. Shriver, Atkins P. W.: Inorganic Chemistry. Oxford University Press, Oxford 1999.	
Course language: Slovak language, English language	
Notes:	

Course assessment
Total number of assessed students: 86

A	B	C	D	E	FX
89.53	6.98	3.49	0.0	0.0	0.0

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

Date of last modification: 27.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

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

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

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

Recommended literature:
As recommended by the teacher.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 393

A	B	C	D	E	FX
96.18	1.78	1.02	0.25	0.25	0.51

Provides: RNDr. Martin Vavra, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Mária Kožurková, CSc., prof. RNDr. Juraj Černák, DrSc., prof. Dr. Yaroslav Bazeľ, DrSc., prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Zuzana Vargová, Ph.D., doc. RNDr. Ivan Potočňák, PhD., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., prof. Mgr. Vasiľ Andruch, DSc., prof. RNDr. Renáta Oriňaková, DrSc., RNDr.

Miroslava Matiková Maľarová, PhD., doc. RNDr. Juraj Kuchár, PhD., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Miroslav Almáši, PhD., RNDr. Rastislav Serbin, PhD.
Date of last modification: 25.01.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CTF1/00	**Course name:** Solid State Chemistry

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

Number of ECTS credits: 5

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

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 78

A	B	C	D	E	FX
57.69	26.92	12.82	1.28	1.28	0.0

Provides: RNDr. Martin Vavra, PhD., doc. RNDr. Juraj Kuchár, PhD.

Date of last modification: 17.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ NPC3/02	**Course name:** Special Seminar
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion: The student is obliged to attend all seminars in the given semester, which take place in person or remotely (via BBB or MS Teams), depending on the pandemic situation. The seminars also include lectures by domestic and external lecturers. From each seminar, resp. lecture the student submits a one-page summary. The student receives the evaluation on the basis of participation in lectures, activity (manifested, for example, by asking questions on the topic) and the quality of the summaries prepared. In case of non-participation for serious reasons, compensation is possible in agreement with the teacher.	
Learning outcomes: To get acquainted with the current state of academic, resp. applied research in the field of inorganic chemistry both in Slovakia and abroad. The added value is to gain an overview of the possibilities of future employment in the field of inorganic chemistry after graduation and the possible possibility of establishing new working contacts.	
Brief outline of the course: Current research topics in the field of inorganic chemistry, organometals, bioinorganic chemistry, materials chemistry and used study methods enriched with industrial application possibilities.	
Recommended literature: Actual scientific papers and literature concerning the actual research topics in inorganic chemistry. Shriver D.F. Shriver, Atkins P.W.: Inorganic Chemistry. Oxford University Press, Oxford 1999.	
Course language: Slovak language, English language	
Notes:	

Course assessment
Total number of assessed students: 46

A	B	C	D	E	FX
76.09	21.74	0.0	2.17	0.0	0.0

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

Date of last modification: 27.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

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: 15193

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
86.05	0.07	0.0	0.0	0.0	0.05	8.69	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., doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD.

Date of last modification: 07.02.2024

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

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: 13318

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
84.37	0.51	0.02	0.0	0.0	0.05	10.78	4.28

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., doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD.

Date of last modification: 07.02.2024

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: I., II.

Prerequisities:

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

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

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

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

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

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 9100

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.37	0.07	0.01	0.0	0.0	0.02	4.46	7.07

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., doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD.

Date of last modification: 07.02.2024

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I., II.

Prerequisities:

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

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

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

Recommended literature:
BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571
BUZKOVÁ, K. 2006. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN 8024715252.
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: 5671

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
82.81	0.28	0.04	0.0	0.0	0.0	7.97	8.9

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., doc. PaedDr. Ivan Uher, MPH, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Zuzana Küchelová, PhD.

Date of last modification: 07.02.2024

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SAZ1/15	**Course name:** Stereochemistry of Inorganic Compounds

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: 3

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

Course level: II.

Prerequisities:

Conditions for course completion:
Successful completion of two written tests (2 x 50b) in the middle and at the end of the semester. Final written test (100b) in the examination period. A minimum of 50% for each test is considered successful. 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:
Gaining knowledge of the structure, isomerism and stereochemistry of inorganic compounds.

Brief outline of the course:
Molecular symmetry, distribution of electron pairs on valence shell, configuration of molecules, polyhedral-regular, semi-regular, irregular, chemical coordination polyhedra, secondary building units, spin and charge correlation, non-equivalence of electron pairs, molecular geometry

Recommended literature:
Kepert, D.L.: Inorganic stereochemistry, Sringer, 1982.
Morris, D.G.: Stereochemistry, Royal Society of Chemistry, 2001
Schiermund, T.: Introduction to stereochemistry, Springer, 2021.

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. A notebook is required for the exercises, as some assignments require data analysis in graphics programs.

Course assessment
Total number of assessed students: 38

A	B	C	D	E	FX
65.79	18.42	10.53	5.26	0.0	0.0

Provides: doc. RNDr. Miroslav Almáši, PhD.
Date of last modification: 27.01.2022
Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ STA1/03	**Course name:** Structure Analysis
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 2 / 2 **Per study period:** 28 / 28 **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 1.	
Course level: II.	
Prerequisities:	
Conditions for course completion: 2 written tests during semester and written examination. The final evaluation is based on the results from the tests (30 %) and written examination (70 %). The student must obtain at least 51% of each test and exam. The same is valid also for online education.	
Learning outcomes: Students get an overview about the symmetry at the micro- and macrostructure level, about principles of difraction and about diffraction methods used for the crystal structure determination and they will learn how to use the results of the crystal structure analysis in their own work.	
Brief outline of the course: Macrostructure and microstructure symmetry, individual work with space groups. Theoretical basis of the diffraction experiment. Practical aspects of crystal structure solution. Processing the results of structural analysis. Theoretical basis, practical aspects and possibilities of X-ray powder diffraction analysis, its use at work of a chemist.	
Recommended literature: Massa, W.: Crystal structure determination, 2nd edition. Springer 2004. Clegg, W. et al.: Crystal structure analysis. Principles and practice. Oxford University Press 2009. Hahn, T.: International tables for crystallography, Vol. A. Kluwer Academic Publishers 2002. Klug, H.P. & Alexander, L.E.: X-Ray diffraction procedures for polycrystalline and amorphous materials. John Wiley & Sons, Inc. 1970.	
Course language: Slovak and English	
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: 148					
A	B	C	D	E	FX
26.35	16.22	28.38	20.27	8.11	0.68
Provides: doc. RNDr. Ivan Potočňák, PhD.					
Date of last modification: 21.07.2022					
Approved: prof. RNDr. Juraj Černák, DrSc.					

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: 2., 4.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 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: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ LKSp/13	**Course name:** Summer Course-Rafting of TISA River

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

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: 209

abs	n
37.32	62.68

Provides: Mgr. Dávid Kaško, PhD.

Date of last modification: 29.03.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SMCH/03	**Course name:** Supramolecular 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: 4

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

Course level: II.

Prerequisities:

Conditions for course completion:
Presentation of a chosen topic.
Final written exam, min 51%.
A: 91-100%
B: 81-90%
C: 71-80%
D: 61-70%
E: 51-60%
FX: 0-50%

Learning outcomes:
Study of interactions between molecules and their arrangement into komplexes which are the basic of most of biochemic systems and modern materials.

Brief outline of the course:
Definition and history of supramolecular chemistry. Basics – receptors, recognition, coordination, complementarity, lock-key principle. Nature of interactions in supramolecular chemistry. Supramolecular chemistry in nature. Rhodopsin and bacteriorhodopsin – light as information and energy source. Porfyrins, DNA. Crown ethers, podands, cryptands, spherands, cyclophanes, proton and hydrid sponges. Selectivity and complementarity. Interactions with solvent. Macrocyclic and template effect. Receptors for neutral molecules. Clatrates and intercalates. Cyclodextrines, calyxarenes. Molecular tweezers. Cavites and cages. Fullerenes as host and guest. Modifications of fullerenes. Nanotubes. Analytical methods in supramolecular chemistry. NMR – NOE and more-dimensional experiments, time-depending NMR. Supramolecular catalysis and transport. Proximity effect. Self-organization and recognition in catalysis. Active transport – cation and anion carriers, molecular pumps. Passive transport – transmembrane chanels. Self-organization. Formation of discrete geometric structures and capsules as result of multiple components interactions. Template synthesis. Catenanes, rotaxanes and helicates. Programable supramolecular systems. Miceles and double-layers. Dendrimers. Crystal enginering. Synthesis of crystals and co-crystals on basis of non-covalent interactions of certain molecules and prediction of their structure. Effect of aditives on growing and structure of crystals. Enantiospecific synthesis in crystals. Liquid crystals.

Recommended literature:

1. Lecture handouts can be found at http://lms.upjs.sk/course/view.php?id=385
2. J.W.Steed and J.L.Atwood, Supramolecular chemistry, Wiley : Chichester, 2000.
3. F.Vogtle, Supramolecular chemistry: an introduction, Wiley : Chichester, 1991.
4. J. W. Steed: Supramolecular chemistry, John Wiley and Sons. Ltd. 2009.

Course language:
english

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

Course assessment
Total number of assessed students: 75

A	B	C	D	E	FX
66.67	20.0	10.67	1.33	1.33	0.0

Provides: RNDr. Ján Elečko, PhD.

Date of last modification: 28.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
Successful completion of a written test. In accordance with the UPJŠ Study Regulations, successful completion is conditioned by obtaining at least 51% of the maximum possible points.
Active and mandatory participation in seminars, elaboration of seminar papers. Each student will prepare one seminar paper on a given topic.

Learning outcomes:
The student will gain information about the methods of thermal analysis used to study and characterize the physical and chemical properties of inorganic and organic compounds as well as solid materials during heating, the equipment used to study thermal properties and the reaction kinetics of decomposition processes.
Mastering the basic principles and methods of thermal analysis and its use to characterize changes in the physical and chemical properties of the substance during heating (inorganic compounds and materials, organic substances and pharmaceuticals).

Brief outline of the course:
1. Introduction, history, definition and development of thermal analysis methods. Terminology of thermal analysis.
2. Classification of thermal analysis methods. Overview of individual thermoanalytical techniques and measured parameters. Description of thermoanalytical curves. Isothermal and non-isothermal methods of thermal analysis.
3.) Equipment and instruments used in thermal analysis.
4.) Thermocouples, their construction and division. Temperature measurement method, thermocouples, resistance thermometers, thermistors.
5.) Classification of processes monitored by thermal analysis (solid-solid reaction, solid-liquid, solid-gas, melt reactions).
6.) Thermogravimetry methods (TG / DTG). Principle, methods, thermal scales, types of scales, temperature measurement.
7.) DSC and DTA method (principle, method of connecting thermocouples, sample carriers, registration devices).
8.) Other methods of thermal analysis - emanation thermal analysis, thermodilatometry, thermomechanical analysis, thermomagnetometry.

9.) Analysis of released gases and coupled techniques in thermal analysis (IČ, MS)
10.) Basics of kinetics.
11.) Methods for determining the kinetics of processes from thermoanalytical measurements (ASTM, OFW, Friedman analysis, model-free methods)
12. Presentation and publication of results of thermoanalytical measurements. Application of TA methods to inorganic, organic materials and minerals.

Recommended literature:

1. Zeleňák, V.: Termická analýza, Interný učebný text, PF UPJŠ, 2020.
2. Györyová K., Balek V.: Termická analýza, PF UPJŠ, Edičné stredisko, Košice, 1992.
3. Brown E.M., Gallagher P.K.: Handbook od Thermal Analysis and Calorimetry , Elsevier Amsterdam 2008.
4. Bohne G.H., Hemminger W.F., Flammerschein H.J.. Differential Scanning Calorimetry, Springer Verlag Berlin 2003
5. Blažek A.: Termická analýza, Praha, 1972, SNTL
6. Wendlandt W. W.: Thermal Methods of Analysis, 2. vydanie, New York, 1985.
7. Šesták J.: Měření termofyzikálních vlastností pevných látek, Academia Praha, 1982.

Course language:
Slovak, English

Notes:
The course is standardly realized in full-time form, in case of necessary circumstances by distance.

Course assessment
Total number of assessed students: 89

A	B	C	D	E	FX	N	P
58.43	15.73	8.99	1.12	1.12	0.0	0.0	14.61

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 21.11.2021

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ USOL/09	**Course name:** Určovanie štruktúry organických zlúčenín

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: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
1. Attendance at seminars (this also applies to the online form of teaching): justified student non-participation in two seminars will be justified by the teacher; longer-term justified non-participation of the student in seminars must be demonstrated mastery of the curriculum by the student in an alternative form determined by the teacher (eg elaboration of assignments, preparation of a lecture, ...)
2. Activity at seminars (also applies to the online form of teaching) - theoretical preparation of students for all seminars is required
3. Elaboration of written assignments (50% of the total evaluation) according to the instructions of the teacher through the e-learning portal LMS Moodle.
4. Passing the final test through the e-learning portal LMS Moodle (50% of the total evaluation).

Learning outcomes:
The aim of the course is to gain theoretical knowledge and practical skills to solve the NMR spectra of small organic molecules. Emphasis is placed on successfully managing the work in the MNova program.

Brief outline of the course:
1. Introduction to NMR
2. Assignment of 1H and 13C NMR chemical shifts to atoms of known structure
3. Homonuclear spin-spin (scalar) coupling constants
4. Chemical and magnetic equivalence, topics
5. Spin systems
6. Heteronuclear interactions H-D, C-D
7. Heteronuclear coupling constants H-C, H-N
8. Nuclear Overhauser effect
9. Relaxation
10. NMR of carbohydrates
11. 19 F NMR
12. 15N NMR
13. 31 P NMR
14. Spectrum processing by MNova program

Recommended literature:

1. E. Pretsch, P. Bühlmann, C. Affolter: Structure Determination of Organic Compounds: Tables of Spectral Data.
2. J. H. Simpson: Organic Structure Determination Using 2D NMR Spectroscopy, 2012, Academic Press, Massachusetts USA.
3. Prednášky na e-learningovom portáli LMS Moodle.

Course language:

english

Notes:

The capacity of the course is given by the capacity of the room RB0C08 (max. 18 students). Teaching is carried out in person or, if necessary, online using the MS Teams or BBB (BigBlueButton) tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment

Total number of assessed students: 104

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Provides: doc. RNDr. Mária Vilková, PhD.

Date of last modification: 28.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VES/03	**Course name:** Vibrational and electronic spectroscopy

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 90

A	B	C	D	E	FX
61.11	17.78	11.11	5.56	3.33	1.11

Provides: doc. RNDr. Juraj Kuchár, PhD.

Date of last modification: 21.01.2022

Approved: prof. RNDr. Juraj Černák, DrSc.