CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ PKLB/13	**Course name:** Advances in Clinical Biochemistry

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: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration of a seminar paper on a topic related to the subject Klinical Biochemistry. A discussion with the examiner about the topic of the seminar work, in which the student is given the opportunity to prove that they possess sufficient knowledge of the subject.

Learning outcomes:
Familiarize postgraduate students with newest knowledge from medicinal biochemistry and pathobiochemistry.

Brief outline of the course:
Molecular basis of medicinal biochemistry (urine, kidney, pancreas, gland, heart, blood circulation, lungs and bronchi, liver and bile duct) and its application into practice.

Recommended literature:
Rosenthal, M.D., Glew, R.H.: Medical biochemistry – human metabolism in health and disease, Wiley and Sons, 2009.

Course language:
English

Notes:
Teaching is carried out either face-to-face or remotely/hybrid learning using the MS Teams program. The teaching format is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 6

N	P
0.0	100.0

Provides: prof. RNDr. Mária Kožurková, CSc.

Date of last modification: 13.03.2023

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ BINF/06	**Course name:** Bioinformatics

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

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Independent work on assignments during the semester
Final assignment, exam

Learning outcomes:
The student will obtain information and practical experience with methods of obtaining and analyzing biological sequences using either a PC and freely available software (BioEdit, RasMol, VNTI-Viewer, MAGA), as well as using software available via the www network.
In addition to basic information, students will also get information about some specialized analyzes - molecular taxonomy, phylogenetic analysis and prediction of biopolymer structures.

Brief outline of the course:
Use of PC and online web servers in sequence analysis. Freely available biological databases (PubMed, GenBank, SwissProt). Analysis of nucleotide sequences. Analysis of protein sequences. Pairwise sequence comparisons - blast analysis. Multiple sequence comparison - clustal program. Molecular taxonomy of bacteria. Evolutionary and phylogenetic analyses. Predicting the secondary and tertiary structure of biopolymers.

Recommended literature:
The phylogenetic handbook, Salemi, M. a Vandamme, A-M., Cambridge University Press, 2003, 485 pp
Bioinformatics: a practical guide to the analysis of genes and proteins, Baxevanis, AD; Francis Ouellette, BF. 4th edition, Wiley, 2020, 609 pp.

Course language:
slovak, english

Notes:

Course assessment
Total number of assessed students: 44

N	P
0.0	100.0

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor
Date of last modification: 09.08.2022
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ COK/22	**Course name:** Certified training course

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: III.

Prerequisities:

Conditions for course completion:
Completion of a certified professional/training course.

Learning outcomes:
The PhD student acquires up-to-date scientific knowledge, develops the capabilities of scientific work and familiarizes himself with the methodologies of making scientific knowledge available. He confronts his own knowledge and skills with other course participants, develops the abilities of peer discussion in the given scientific field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ CZC/04	**Course name:** Citation in the International Scientific Journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 71

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ CDC/04	**Course name:** Citation in the Local Scientific Journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 1	

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ CM/04	**Course name:** Citation in the Monograph
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 4	

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SDPR/04	**Course name:** Co-worker of a Local 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: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 518	

abs	n
99.81	0.19

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ SMPR/04	**Course name:** Co-worker of an International 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: 15

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Membership in the research team of an international project.

Learning outcomes:
Active involvement by solving a specific task within a team of international project solvers. The PhD student demonstrates the ability to work in a team, take responsibility for the assigned task, adhere to the time schedule and fulfill the project outputs. The PhD student gains personal experience from the implementation of an international project, participation in its key stages, creation of measurable outputs, grant funding of science.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 43

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ KSB/13	**Course name:** Conformational Stability of Proteins
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 4 / 2 **Per study period:** 56 / 28 **Course method:** present	
Number of ECTS credits: 8	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Examination.	
Learning outcomes: Student should attain extended knowledge in the field of conformation properties of proteins, folding and biosynthesis of proteins, formation and characteristics of missfodled and agregated proteins, new techniques in study of proteins: solvent engineering, display/evolution technologies.	
Brief outline of the course: 1. Chemical properties of polypeptides (the polymeric nature of proteins, amino acid residues, the polypeptide backbone..). 2. Protein structure determination methods. Physical interaction that determine the properties of proteins, conformational properties of polypeptide chains. Biosynthesis of proteins. 3. Proteins in solution and in membrane (folded state, missfolded states and denatured states of globular proteins..) – stability of the folded conformations of proteins, flexibility and dynamics of protein structure. Misfolded and aggregated states of proteins. 4. Protein stability – thermodynamic and kinetic stability. Methods for determination of protein stability. Modification of protein stability: solvent engineering, display/evolution technologies.	
Recommended literature: 1. David L. Nelson, Michael M. Fox, Lenhinger principles of biochemistry, W.H.Freeman, New York, 2004. 2. J.M. Berg, J.L. Tymoczko, L. Stryer, Biochemistry, W.H.Freeman, New York, 2007. 3. Thomas E. Creighton, Proteins, Structure and Molecular Properties (2nd Ed.), W.H.Freeman; New York, 1993. 4. Articles from Scientific Journals.	
Course language:	
Notes:	

Course assessment Total number of assessed students: 4	
N	P
0.0	100.0
Provides: prof. RNDr. Erik Sedlák, DrSc.	
Date of last modification: 13.03.2023	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ODZP/15	**Course name:** Defence of Doctoral Thesis

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

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
The Dissertation thesis is the result of the student's own scientific research. It must not show elements of academic fraud and must meet the criteria of correct research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavel Jozef Šafárik University in Košice and its constituents. Fulfillment of the criteria is verified mainly in the process of supervising and in the process of the thesis defense. Failure to do so is grounds for disciplinary action.

Learning outcomes:
The Dissertation thesis has elements of a scientific work and the student demonstrates extensive mastery of the theory and professional terminology of the field of study, acquisition of knowledge, skills and competences in accordance with the declared profile of the graduate of the field of study, as well as the ability to apply them in an original way in solving selected problems of the field of study. The student demonstrates the ability of independent scientific work in terms of content, formal and ethical aspects. Further details of the Dissertation thesis are determined by Directive no. 1/2011 on the essential prerequisites of final theses and by the Study Rules of Procedure at UPJŠ in Košice for doctoral studies.
The doctoral student demonstrated the ability and readiness for independent scientific and creative activity in the field of study of philology in accordance with the expectations of the relevant qualification framework and the profile of the graduate.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 76

N	P
0.0	100.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ DZS/15	**Course name:** Dissertation examination
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 63	

N	P
0.0	100.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VPZP/22	**Course name:** Elaboration of reviewer report

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration of reviewer report

Learning outcomes:
The PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly recommend another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ AJD1/07	**Course name:** English Language for PhD Students 1

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of e-course English for PhD Students (lms.upjs.sk), consultations (1-3).
Written assignments - Professional/Academic CV, Short Academic Biography.

Learning outcomes:
The development of students´ language skills - reading, writing, listening, speaking; improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects; development of pragmatic competence - students acquire skills for effective and purposeful communication, with focus on Academic English and English for specific/professional purposes, level B2.

Brief outline of the course:
Specific aspects of academic and professional English with focus on correct pronunciation, vocabulary development (noun and verb collocations, phrasal verbs, prepositional phrases, word-formation, formal/informal language, etc.), selected aspects of English grammar (prepositions, grammar tenses, passive voice, etc.), academic writing (professional/academic CV, Short Academic Biography).

Recommended literature:
Moore, J.: Oxford Academic Vocabulary Practice. OUP, 2017.
Kolaříková, Z., Petruňová, H., Timková, R.: Angličtina v akademickom prostredí – cvičebnica. Košice, Vydavateľstvo ŠafárikPress, 2021.
Tomaščíková, S., Rozenfeld, J. Developing Academic English in Speaking and Writing. Vydavateľstvo ŠafárikPress, 2021.
McCarthy, M., O´Dell, F.: Academic Vocabulary in Use. CUP, 2008.
Štepánek, L., J. De Haff a kol.: Academic English-Akademická angličtina. Grada Publishing, a.s., 2011.
Armer, T.: Cambridge English for Scientists. CUP, 2011.
lms.upjs.sk

Course language:
English, level B2 according to CEFR

Notes:

Course assessment
Total number of assessed students: 780

N	Ne	P	Pr	abs	neabs
0.0	0.0	45.64	0.0	54.23	0.13

Provides: Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 06.09.2024

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: CJP/ AJD2/07	**Course name:** English Language for PhD Students 2
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** distance, present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Test, oral exam in accordance with the exam requirements (available at the web-site of the LTC and in MS TEAMS)	
Learning outcomes: The development of students´ language skills - reading, writing, listening, speaking, improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects, development of pragmatic competence - students can efectively use the language for a given purpose, with focus on Academic English and English for specific/professional purposes, level B2.	
Brief outline of the course: Academic communication (self-presentation, presenting at scientific meetings and conferences). Specific aspects of academic and professional English with focus on vocabulary development (formality, academic word-list), English grammar (passive voice, nominalisatio), language functions (expressing opinion, cause/effect, presenting arguments, giving examples, describing graphs/charts/schemes, etc.). Cross-language interference.	
Recommended literature: Moore, J.: Oxford Academic Vocabulary Practice. OUP, 2017. Kolaříková, Z., Petruňová, H., Timková, R.: Angličtina v akademickom prostredí (cvičebnica). UPJŠ Košice, 2021. Tomaščíková, S., Rozenfeld, J. Developing Academic English in Speaking and Writing. Vydavateľstvo ŠafárikPress, 2021. McCarthy, M., O´Dell, F.: Academic Vocabulary in Use. CUP, 2008. Štepánek, L., J. De Haff a kol.: Academic English-Akademická angličtina. Grada Publishing, a.s., 2011. Armer, T.: Cambridge English for Scientists. CUP, 2011.	
Course language: B2 level according to CEFR	
Notes:	

Course assessment
Total number of assessed students: 774

N	Ne	P	Pr	abs	neabs
0.26	0.0	94.06	1.03	4.52	0.13

Provides: Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 05.02.2024

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ GI/06	**Course name:** Genetic Engineering
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 4 / 2 **Per study period:** 56 / 28 **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 17

N	P
0.0	100.0

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor
Date of last modification: 16.11.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/SSOL/04	**Course name:** Individual Study of Scientific Literature

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Independent work of a doctoral student with books, monographies, databases and source documents, obtaining informations for elaboration of the thesis, for preparation of experiments or preparation of publication, respectively.

Brief outline of the course:
Independent study of literature following the suggestions of the tutor.

Recommended literature:
Books, monographs,
Web of Science,
SCOPUS,
original papers

Course language:
English language.

Notes:

Course assessment
Total number of assessed students: 217

abs	n
100.0	0.0

Provides:

Date of last modification: 05.11.2021

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ MK/04	**Course name:** International Conference
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:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 227	
abs	n
100.0	0.0
Provides:	
Date of last modification: 15.09.2021	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ZSP1/22	**Course name:** International Study Stay less than 30 Days

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of a foreign study stay lasting less than 30 days.

Learning outcomes:
By completing a shorter study stay, the PhD student demonstrates the ability to reflect on research problems and work critically with sources at an expert level and in an interdisciplinary context, while being able to generate new knowledge. He is able to actively communicate at an expert level in more than one language. He acts as a responsible independent scientist, works independently and in a group with the aim of pushing the boundaries of knowledge and transferring them to other areas of research, to practice and to the wider public. He can competently argue and explain his ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 8

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ZSP2/22	**Course name:** International Study Stay more than 30 Days

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

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of a foreign study stay lasting more than 30 days.

Learning outcomes:
By completing the study stay, the PhD student demonstrates the ability to reflect on research problems and work critically with sources at an expert level and in an interdisciplinary context, while being able to generate new knowledge. He is able to actively communicate at an expert level in more than one language. He acts as a responsible independent scientist, works independently and in a group with the aim of pushing the boundaries of knowledge and transferring them to other areas of research, to practice and to the wider public. He can competently argue and explain his ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 7

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/DK/04	**Course name:** Local Conference

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in the home conference.

Learning outcomes:
By actively participating in the national scientific conference, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology in his scientific field. He demonstrates the ability to reflect on a specific scientific problem by using the latest approaches and applying them critically. Demonstrates competence in using existing theories and concepts in an innovative way, as well as generating new original scientific knowledge and communicating research results to a wider audience using adequate means and through the Slovak language.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 133

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ DKZU/04	**Course name:** Local Conference with Foreign Participation
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: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 256

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/POVK/22	**Course name:** Membership in a Conference organizing Committee

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Work in the organizing committee of the conference

Learning outcomes:
By working in the organizing committee of the conference, the PhD student demonstrates the abilities and competences to organize a scientific or professional event independently or in a team, to manage the implementation in terms of time and content, to communicate effectively verbally and in writing using various technical means as needed, including in a foreign language at a professional level with various types of people, if necessary, correctly recommend solutions or make independent decisions.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 4

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MPEP/06	**Course name:** Methodology of Experimental Work

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: III.

Prerequisities:

Conditions for course completion:
Elaboration of a seminar paper on a topic related to the methodical approaches in experimental work and the topic of the student's doctoral studies. A discussion with the examiner about the topic of the seminar work, in which the student is given the opportunity to prove that they possess sufficient knowledge of the subject.

Learning outcomes:
The aim of the course is to provide students with a basic understanding of the methodology of scientific work, the creation and verification of scientific theories, the design, implementation and interpretation of scientific experiments, the presentation of scientific results in biochemistry and other related fields.

Brief outline of the course:
The science of science, the scientific method, scientific logic, induction and deduction, empirical methods of science, the construction of scientific theories, the methodology of biological and chemical sciences, problem formulation, the implementation, interpretation and evaluation of experiments, the presentation of results, the principles of creating scientific publications.

Recommended literature:
Wanunu M., Tor, Yitzhak.: Methods for studing nucleic acids/drug interaction. CRc Press, Taylor and Francis Group, 2012.
Chaires, J.B., Waring, M.J.: Methods in Enzymology, Academic Press, 2001.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 19

abs	n
100.0	0.0

Provides: prof. RNDr. Mária Kožurková, CSc., doc. RNDr. Viktor Víglaský, PhD., prof. RNDr. Erik Sedlák, DrSc., RNDr. Danica Sabolová, PhD., univerzitná docentka, doc. RNDr. Rastislav Varhač, PhD.
Date of last modification: 07.03.2023
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ MBPS/22	**Course name:** Mitochondria: biochémia procesov starnutia a neurodegeneratívnych ochorení
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 4 / 2 **Per study period:** 56 / 28 **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Active problem solving; attendance at lectures; an exam.	
Learning outcomes: The main goal of the course is to provide a comprehensive review of up-to-date knowledge of mitochondrial bioenergetics and oxidative stress. The focus is given to the mechanisms of energy generation, characterization of the individual complexes of electron-transport chain, oxidative stress generation, the origin, and characterization of individual reactive species, cellular defense against oxidative stress, as well as the biochemical mechanisms of aging and age-related diseases. The course will allow the students to gain valuable insight into the interplay between mitochondrial bioenergetics, oxidative stress, and pathological processes leading to age and age-related neurodegenerative diseases.	
Brief outline of the course: 1. Oxidative stress – general introduction On the history of oxidative stress. Theories of aging. The mitochondrial free radical theory of aging. Oxygen. Oxygen and its derivative. Reactive oxygen species (ROS). Free radicals. Sources of ROS. The chemistry of free radicals and non-radical reactive species. Oxidative damage to biomolecules Oxidative nuclear and mitochondrial DNA damage. Lipid peroxidation. Products of lipid peroxidation. Oxidative modifications of proteins. 2. The role of mitochondria in the development of oxidative stress Introduction in mitochondrial structure and function. Mitochondrial electron transport chain. Monitoring of mitochondrial membrane potential. Description of individual electron transport complexes and their role in oxidative stress. Generation of oxygen radicals and oxidative stress in mitochondria. Initiation of apoptosis in mitochondria. 3. Cellular redox status: free radicals and oxidative stress Generation and characterization of the reactive species: Singlet Oxygen. Superoxide Radical. Hydrogen Peroxide. Hydroxyl Radical. Peroxyl Radicals. Reactive Nitrogen Species (RNS). The chemistry of free radicals and related “reactive species”. How do radicals react? Radical chemistry, thermodynamics and kinetics. Chemistry of biologically important radicals and non-radicals. Detection of free radicals and other reactive species. 4. Oxidative stress in pathogenesis	

Neurodegenerative Diseases: Parkinson's and Alzheimer's Diseases. Role of Oxidative Stress in Pathogenesis of AD and PD. Cascades Leading to Dopamine Cell Degeneration. Antioxidants Link in Neurodegenerative Disorders. Cardiovascular Diseases. Hypoxia and Stroke. ROS and Myocardial Infarction. Reproductive Systems Disorders (Male and Female). Autoimmune Diseases Oxidative Stress in Metabolic Disorders/Diseases. Oxidative Stress and Carcinogenesis. Physiological Significance of Oxidative Stress.
5. Managing oxidative stress/targeting ROS
Antioxidant defenses - Definitions and classifications. Mechanism of action of antioxidants Endogenous: Cellular Antioxidant defense System - Exogenous: Essential Trace Elements, Vitamins, Dietary supplements, and their modes of action.
Oxidative stress-scavenging strategies/targeting: endogenous and exogenous - molecular network and modes of actions of antioxidants in transcriptional regulation of ROS and oxidative stress.
6. Detection of free radicals other reactive species
ESR and spin trapping. Detection of superoxide – histochemical method. Detection of nitric oxide. Nitration assay – detection of peroxynitrite. Direct and indirect detection of hydrogen peroxide and singlet oxygen. Lipid peroxidation detection. Analysis of total antioxidant activity.

Recommended literature:

1. B. Halliwell and J.M.C. Gutteridge: Free Radicals in Biology and Medicine, Oxford Science Publications, 2000.
2. M.B. Jackson: Molecular and Cellular Biophysics, Cambridge Univ. Press 2006.
3. R.M.J. Cotterill: Biophysics – An Introduction, J.Wiley & Sons,Ltd. 2002.
4. G. Krauss: Biochemistry of Signal Transduction and Regulation, Wiley/VCH 2003.
5. D. G. Nicholls and S.J Ferguson: Bioenergetics 4, Elsevier, 2013.
6. M. Ramirez-Alvarado, J. W. Kelly, C. M. Dobson: Protein Misfolding Diseases: Current and Emerging Principles and Therapies; 2010 John Wiley & Sons, Inc.
7. L. Montagnier, R. Olivier, C. Pasquier: Oxidative Stress in Cancer, AIDS, and Neurodegenerative Diseases. CRC Press , 2019.

Course language:

Notes:

Course assessment

Total number of assessed students: 0

N	P
0.0	0.0

Provides: MUDr. Andrey Musatov, DrSc., Ing. RNDr. Katarína Šipošová, PhD.

Date of last modification: 22.11.2021

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ MTB/13	**Course name:** Modern Trends in Biotechnology
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: 6	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Writing the seminar work.	
Learning outcomes: Students will have the latest knowledge and trends in biotechnology.	
Brief outline of the course: Methods, disciplines and the use of biotechnology. The material base for biotechnology. Genetic engineering, cloning, artificial insemination and conventional techniques of plant biotechnology. Biomass - Biotechnology substrate. Biogas. Fermentation processes, cultivation equipment, types of fermenters and mixers. Food Biotechnology: alcoholic fermentation, production of spirits, beer and wine. Production of dairy products, amino acids and vitamins. Manufacture of organic solvents: acetone, butanol, ethanol. Biotechnology in medicine. Production of antibiotics, vaccines and proteins for therapeutic purposes. Wastewater treatment: biological filters, membrane bioreactors, sludge disposal, removal of solid impurities and water disinfection.	
Recommended literature: 1. Y.H. Hui, Ph.D, Wai-Kit Nip, Leo M.L. Nollet, PhD, Gopinadhan Paliyath, Ph.D., Benjamin K. Simpson, Food Biochemistry and Food Processing, Wiley-Blackwell, 2006. 2. E. M. T. El-Mansi, C. F. A. Bryce, Arnold L. Demain, A.R. Allman, Fermentation Microbiology and Biotechnology, Second Edition, CRS Press, 2006. 3. Principles of Fermentation Technology, Second Edition, P F Stanbury, S. Hall, A. Whitaker, Elsevier Science Ltd., 1999. 4. J. G. Black, Microbiology (seventh edition), John Wiley & Sons, Inc. 2008. 5. J. E. Smith, Biotechnology (fifth edition), UK, University Press, Cambridge, 2009. 6. W. Bains, Biotechnology from A-Z (third edition), Oxford university Press, 2004.	
Course language:	
Notes:	

Course assessment Total number of assessed students: 8	
N	P
0.0	100.0
Provides: RNDr. Danica Sabolová, PhD., univerzitná docentka	
Date of last modification: 07.03.2023	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ NKSF/13	**Course name:** Nucleic Acids: Structure and Function

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: 6

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Participation in the lectures (also by distance learning).
The lecturer conducting the lecture/seminar will excuse the justified absence of the student (sickness, family reasons, etc.) at a maximum of two lectures/seminars during the semester. In the event of longer-term justified absence (e.g. due to sickness), the student must provide evidence of mastery of the missed course content by means of an agreed substitute; oral examination

Learning outcomes:
The main objective of the course is to provide studenst of PhD degree the newest trends in the field of molecular biology and biochemistry focused on nucleic acids.

Brief outline of the course:
Cell signaling system. Molecular basis of neoplastic cell transformation leading to development of cancer - oncogenes, tumor suppressing genes, regulatory regions of DNA. Gene mutations and DNA repair mechanisms. Induced pluripotent stem cells. Current trends and advances in the study of nucleic acids, their biological significance in cell metabolism. Gene therapy. Gene editing-CRISPR Cas technology. Gene silencing. The classification of viruses based on genetic material, the effect of physical and chemical factors on viruses. Biochemistry of viruses. Virus replication. Viral oncogenicity. Retroviruses and HIV. Pandemic viruses - Covid, SARS, MERS, Ebola, influenza papillomaviruses. Prions. Aptamers and nanobioconjugates. Molecular basis of the manifestation of genetically determined diseases and their detection and diagnostic.

Recommended literature:
1. B. Alberts, A. Johnson, J. Lewis , M. Raff , K. Roberts , P.: Walter Molecular Biology of the Cell, Garland Science, Fifth edition, New York, NY, 2008.
2. Neidle S.: Cancer Drug Design and Discovery, Academic Press, First edition, 2007.
3. Krauss G.: Biochemistry of Signal Transduction and Regulation, Wiley-VCH Verlag GmbH, Second Edition, 2003.

Course language:

Notes:

Course assessment Total number of assessed students: 9	
N	P
0.0	100.0
Provides: doc. RNDr. Viktor Víglaský, PhD.	
Date of last modification: 13.03.2023	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ PVS/04	**Course name:** Patents, Inventions, Software
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Patent filed, invention, software product created.	
Learning outcomes: The PhD student demonstrates the ability to create an innovative product in a given scientific field, or with impact on an interdisciplinary scale or in technical practice.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPE/ PgVU/17	**Course name:** Pedagogy for University Teachers

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
1. Development of a teaching diary—100%
2. Compulsory active participation and attendance in accordance with the Study Regulations.

Learning outcomes:
After completing the course, the student will acquire knowledge, skills, and competencies, i.e., will be able to:
Knowledge
Define and apply basic didactic principles, methods, forms, and tools in the teaching process of university-level professional subjects. Identify and specify educational procedures of a university teacher aimed at effective teaching management, pedagogical diagnostics, and assessment of learning outcomes. Recognize different approaches to pedagogical evaluation and their impact on improving the quality of the educational process at the university level.
Skills
Implement effective educational methods and techniques into the teaching of professional subjects, tailored to the needs of university students. Conduct pedagogical diagnostics, assess students' progress, and apply appropriate evaluation methods to improve learning outcomes. Analyze and reflect on one's own teaching process, identify areas for improvement, and enhance the teaching of professional subjects, including the rationalization of the time and content structure of teaching. Present specific proposals for improving the teaching process, including the use of new technologies and innovative pedagogical approaches.
Competencies
Confidently and effectively manage the teaching of university subjects, applying educational competencies that consider the specifics of higher education. Critically reflect on one's own pedagogical practice and the learning outcomes of students to improve teaching methods and achieve a higher quality of the educational process. Apply innovative solutions to streamline and optimize the teaching process, aiming to increase the engagement and success of university students.

Brief outline of the course:
The personality of a university teacher. Teaching styles. Student in university education. Student learning styles. Possibilities of adapting teaching styles and student learning styles. University teacher–student interaction and communication in the teaching process. Pedagogical competencies

of a university teacher. Didactic analysis of the curriculum; teaching materials and textbooks. Forms of university teaching. Methods of university teaching. Verification methods and student assessment. Creation of a didactic test. Designing university teaching process. University teacher self-reflection.

Recommended literature:

Beránek, J. (2023). Moderní pedagogické metody a přístupy. Praha: Portál.
Fiala, M. (2023). Didaktika a metodika v současné škole. Praha: Grada Publishing.
Kováč, M. (2023). Vzdelávanie v 21. storočí: Inovatívne prístupy a metódy. Nitra: Vydavateľstvo UKF v Nitre.
Koudelka, J. (2023). Moderní didaktika a její aplikace. Praha: Karolinum.
Křížová, M., & Šebová, P. (2023). Vzdělávání učitelů: Teoretické a praktické přístupy. Praha: Triton.
Kučerová, M. (2023). Vzdělávání učitelů a profesionální rozvoj. Praha: Triton.
Mocová, M., & Lázňovská, M. (2023). Pedagogika a jej aplikácie v praxi. Bratislava: Vydavateľstvo Spolku slovenských pedagogických pracovníkov.
Novák, J., & Pol, M. (2024). Pedagogické výzkumy a inovace ve vzdělávání. Praha: Portál.
Sikora, J. (2022). Didaktika a metodika vzdelávania: Nové výzvy a trendy. Bratislava: Vydavateľstvo Univerzity Komenského v Bratislave.
Škoda, J. (2022). Efektivní výuka: Praktické strategie a metody. Praha: Grada Publishing.
Švec, J. (2023). Didaktika a školní politika: Teorie a praxe. Praha: Grada Publishing.
Vojtová, K. (2024). Diferenciace a inkluze ve vzdělávání. Praha: Wolters Kluwer.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 121

abs	n	neabs
98.35	0.0	1.65

Provides: doc. PaedDr. Renáta Orosová, PhD.

Date of last modification: 14.09.2024

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ FBB/06	**Course name:** Physiology and Biochemistry of Rumen Microorganisms
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 4 / 2 **Per study period:** 56 / 28 **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 10

N	P
0.0	100.0

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor
Date of last modification: 16.11.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ POPV/22	**Course name:** Popularisation of science

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active involvement in the popularization of science.

Learning outcomes:
Demonstrated ability to present science to the lay public, use interactive methods of scientific communication, identify the target group and adapt the communication language to the level of professional knowledge. A PhD student is able to arouse interest and motivate specific target groups in the field of his scientific work, but also in the wider context of science

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 36

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ VYS/04	**Course name:** Presentation in Seminar
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 191

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/PsVU/17	**Course name:** Psychology for University Lecturers

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

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Case study, micro-output, its analysis
Current modifications of the course are listed in the electronic bulletin board of the course.

Learning outcomes:
After completing the course, students will gain knowledge that allows them to understand, summarize and explain selected psychological knowledge from cognitive psychology, emotion and motivation psychology, personality psychology, developmental, social, educational psychology and health psychology. They will acquire skills to apply the above psychological knowledge necessary for the professional, competent performance of university teaching practice of doctoral students to create and implement the teaching of a professional topic with applied psychological knowledge and develop the competences to create and implement teaching of a professional topic with the application of psychological knowledge, as well as to evaluate their performance and the performance of their classmates in the form of constructive feedback.

Brief outline of the course:
The content of the course is based on selected psychological knowledge of cognitive psychology, psychology of emotions and motivation, personality psychology, developmental, social, educational psychology and health psychology. Teaching is realized by a combination of lectures with interactive, experiential methods, discussion, open communication with mutual respect, support of independence, activity and motivation of students. Syllabus: University teacher and his work in the teaching process with a focus on: teachers in relation to themselves (cognitive, personal, social and competencies in the use of methods), in relation to students and as part of the teacher-student relationship on the basis of selected areas of cognitive psychology, psychology of emotions and motivation, developmental psychology, social psychology, educational psychology and health psychology with application to the university environment

Recommended literature:
Alexitch, L. R. (2005). Applying social psychology to education. Social Psychology.–Ed.: Schneider F., Gruman J., Coutts L.–Sage Publications, Inc, 205-228.
Fry, H., Ketteridge, S., & Marshall, S. (2008). A handbook for teaching and learning in higher education: Enhancing academic practice. Routledge.
Mareš, J.: Pedagogická psychologie. Portál, 2013.

Kniha psychologie. Universum, 2014
Čáp, J., Mareš, J.: Psychologie pro učitele. Praha: Portál 2007.
Vágnerová, M.: Školní poradenská psychológie pro pedagogy. Praha: Karolínum 2005.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 87

abs	n	neabs
98.85	0.0	1.15

Provides: PhDr. Anna Janovská, PhD.

Date of last modification: 02.12.2024

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VIM/13	**Course name:** Research of Individual Molecules

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Examination.

Learning outcomes:
In biological systems, many biopolymers present in small amounts, even as individual molecules. Recently, new methods have been developed to study such systems. The lectures will be given to work regularities of such systems, as well as biochemical and biophysical research methods of individual molecules.

Brief outline of the course:
Biomacromolecules, cells in terms of their individual characteristics. Basic knowledge about the function of lasers and other devices (eg XFEL), suitable for the study of biomacromolecules. GFP protein, dyes - fluorescent probes, nano and microparticles. Atomic force microscopy - AFM, MSM. Microchip electrophoresis and microhydrodynamic devices (MEMS, Lab on a Chip). Super resolution microscopy, two-photon processes, and more. TERS, SERS, Fano resonance. SNOM, fluorescence correlation spectroscopy. GSDM, STED. Storm, FRET, TIRF. Manipulation of individual molecules, cells. Optical tweezers, magnetic tweezers, optical crystals with cavity. Electron microscopy (SEM, TEM), X-ray microscopy. Study of membrane processes, Patch clamp. The electrical conductivity of the molecules, graphene, carbon nanotubes.

Recommended literature:
1. Christoph Zander, Jörg Enderlein, Richard A. Keller Single molecule detection in solution: methods and applications Wiley, 2002.
2. Chris Gell, David Brockwell, D. Alastair Smith, Handbook of single molecule fluorescence spectroscopy, Oxford University Press, 2006.
3. Experimental oriented journal articles:
/ Keir C Neuman & Attila Nagy Single-molecule force spectroscopy: optical tweezers, magnetic tweezers and atomic force microscopy Nature Methods - 5, 491 - 505 (2008)
/ Chirlmin Joo, Hamza Balci, Yuji Ishitsuka,1 Chittanon Buranachai, and Taekjip Ha, Advances in Single-Molecule Fluorescence Methods for Molecular Biology, Annual Review of Biochemistry 77, 51-76 (2008).

Course language:

Notes:	
Course assessment Total number of assessed students: 3	
N	P
0.0	100.0
Provides: doc. RNDr. Viktor Víglaský, PhD.	
Date of last modification: 13.03.2023	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ SCI/04	**Course name:** SCI Citation
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 298	

abs	n
100.0	0.0

Provides:
Date of last modification: 15.09.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ VKBM/13	**Course name:** Selected Topics in Biochemistry of Microorganisms

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration of a seminar paper on a topic related to the subject biochemistry of microorganism and the topic of the student's doctoral studies. A discussion with the examiner about the topic of the seminar work, in which the student is given the opportunity to prove that they possess sufficient knowledge of the subject.

Learning outcomes:
Familiarize postgraduate students with newest knowledge from Biochemistry of microorganism.

Brief outline of the course:
Diversity of microbial world – microbial evolution, taxonomy and diversity.
Ecology and symbiosis – Biogeochemical cycling and introductory microbial ecology, microbial interactions.
Antimicrobial chemotherapy – development of chemotherapy, general characteristics of antimicrobial drugs, determining the level of antimicrobial activity, antibacterial drugs, factor influencing antimicrobial drug effectiveness, drug resistance, antifungal, antiviral and antiprotozoal drugs.
Food and industrial microbiology – microbiology of food, food-borne pathogens.
Applied and industrial microbiology – microorganisms used in industrial microbiology, major products of industrial microbiology.

Recommended literature:
1. Black, J. G.: Microbiology, Wiley & Sons, Inc., 2008.
2. Johnson, T. R., Case, J.: Laboratory Experiments in Microbiology, 9th Ed., Pearson, 2010.
3. Kayser, F. H., Bienz, K. A., Eckert, J., Zinkernagel, R. M.: Medical Microbiology, Thieme, Stitgart-New York, 2001.
4. Levinson, W.: Review of Medical Microbiology and Immunology, McGraw-Hill International Edition, 2010.
5. Willey, J. M., Sherwood, L. M., Woolverton, C. J.: Prescott, Harley, and Klein´s Microbiology, McGraw-Hill International Edition, 2008.

Course language:
English

Notes:
Teaching is carried out either face-to-face or remotely/hybrid learning using the MS Teams program. The teaching format is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment
Total number of assessed students: 15

N	P
0.0	100.0

Provides: prof. RNDr. Mária Kožurková, CSc.

Date of last modification: 07.03.2023

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VKB/06	**Course name:** Selected Topics in Biochemistry

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

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration of a seminar paper on a topic related to the subject and the topic of the student's doctoral studies. A discussion with the examiner about the topic of the seminar work, in which the student is given the opportunity to prove that they possess sufficient knowledge of the subject.

Learning outcomes:
Acquainting doctoral students with the most up-to-date findings in biochemistry.

Brief outline of the course:
Biomacromolecular structures, interactions of ligands with biomacromolecules, newly identified types of biologically active substances, proteomics, mechanisms of enzyme action, new findings in metabolism, apoptosis, supramolecular complexes, metabolites, hormonal processes, molecular physiology, bioenergetics.

Recommended literature:
Latest articles from scientific journals.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 43

N	P
0.0	100.0

Provides: prof. RNDr. Mária Kožurková, CSc.

Date of last modification: 07.03.2023

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ VKBMB/04	**Course name:** Selected Topics in Biochemistry and Molecular Biology
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: 8	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 42

N	P
0.0	100.0

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor
Date of last modification: 18.11.2021
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: Dek. PF UPJŠ/JSD/14	**Course name:** Spring School for PhD Students

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 4d
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in the Spring School of PhD students of UPJŠ.

Learning outcomes:
By actively participating in the Spring School of PhD Students of UPJŠ, the PhD student demonstrates a high level of ability to process the issues of his dissertation for a multidisciplinary audience with an emphasis on clarifying the motivation, scientific problem, processing methodology and own contribution to the solution of the selected topic. The PhD student demonstrates the ability to professionally discuss various research topics, present his own positions and accept a plurality of opinions. Demonstrates the ability to communicate research results to a wider professional audience with adequate means and through the Slovak language.

Brief outline of the course:
1. Interdisciplinary lectures from the fields of medicine, natural sciences, law, public affairs, humanities. Lecturers - top foreign or national experts from the mentioned fields.
2. Scientific lectures in sections created within related disciplines. Lecturers - top experts from UPJŠ from the mentioned fields.
3. Scientific contributions of PhD students in sections of related fields.
4. Panel discussions on the issue of PhD studies and current trends in the development of scientific disciplines at UPJŠ.

Recommended literature:
Proceedings of the Spring School of Doctoral Students.

Course language:

Notes:

Course assessment
Total number of assessed students: 202

abs	n
100.0	0.0

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

Date of last modification: 08.11.2022
Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VPSV/22	**Course name:** Supervision of a Students Scientific Work

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Supervision of Student's Scientific Activity

Learning outcomes:
By guiding a student within the SOČ or ŠVOČ, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PPC1/22	**Course name:** Teaching activities 1 h/s

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 1 semester hour

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PPC2/22	**Course name:** Teaching activities 2 h/s

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: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 2 semester hours

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 15

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PPC3/22	**Course name:** Teaching activities 3 h/s

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:

Course level: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 3 semester hours

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 5

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PPC4/22	**Course name:** Teaching activities 4 h/s

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 4 semester hours

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/KZP/22	**Course name:** Thesis consultant

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: III.

Prerequisities:

Conditions for course completion:
Final thesis consultant.

Learning outcomes:
By consulting the final thesis, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 46

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VZP/22	**Course name:** Thesis supervising

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Supervisor of the final thesis.

Learning outcomes:
By supervising the final thesis, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Mária Kožurková, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ TBFC/04	**Course name:** Trends in Biophysical Chemistry
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 4 / 2 **Per study period:** 56 / 28 **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course: Structure hierarchy of biological systems Time hierarchy in biological systems Regulatory mechanism Cooperativity Autocatalytic processes Atractors, fractals Surface interfaces Evolution of biological systems Molecular principles of morphogenesis, signal transductions Communications, chemotaxis Biomimetic materials Modern biophys.chem methods and devices Modern biophys. Methods and devices	
Recommended literature: Cantor,C.R.,Schimmel,P.R Biophysical Chemistry, W.H. Freeman and Co., S. Francisco,1980 Voet,D. Voet,J.G. Biochemistry, John Willey @Sons, 1990 Kersal E. van Holde, W. Curtis Johnson, P. Shing Ho: Principles of Physical Biochemistry, Prentise Hall, 1998 Articles from Journals	
Course language:	
Notes:	

Course assessment Total number of assessed students: 34	
N	P
0.0	100.0
Provides: doc. RNDr. Rastislav Varhač, PhD.	
Date of last modification: 18.11.2021	
Approved: prof. RNDr. Mária Kožurková, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ PUI/06	**Course name:** Work with Literar Data from Internet
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 38	

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved: prof. RNDr. Mária Kožurková, CSc.	