CONTENT

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

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

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

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

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

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

Notes:

Course assessment
Total number of assessed students: 435

A	B	C	D	E	FX
36.09	22.3	14.94	9.89	5.75	11.03

Provides: Mgr. Viktória Mária Slovenská

Date of last modification: 11.09.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ANCHB/22	**Course name:** Analytical Chemistry for Biologists

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: I.

Prerequisities:

Conditions for course completion:
Completion of block experimental exercises. Written control test. Oral examination.

Learning outcomes:
Fundamentals of Analytical Chemistry for biologists.

Brief outline of the course:
What is the Analytical Chemistry? Basic principles, classification and selection of analytical methods. Qualitative and quantitative analysis. Qualitative analysis, separation by selective precipitation. Quantitative methods. Gravimetry, general principles of method. Volumetric methods. Preparation of accurate solutions. Indication of equvivalency point. Titration curves, calculations in volumetric analysis. Acidimetry, alkalimetry. Manganometry. Iodometry. Complexometry. Argentometry. Instrumental methods of analytical chemistry (basic principles, instrumentation and applications) - electroanalytical, optical and separation methods. Chromatographic and electrophoretic methods.

Recommended literature:
1.D.Harvey: Modern Analytical Chemistry. McGraw Hill Companies, Boston, 2000.
2.D.A.Skoog: Principles of Instrumental Analysis. Saunders Col. Publishing, New York 1985.
3.E.Prichard: Quality in the Analytical Chemistry Laboratory, Wiley, 1995

Course language:

Notes:

Course assessment
Total number of assessed students: 23

A	B	C	D	E	FX
21.74	30.43	30.43	13.04	4.35	0.0

Provides: doc. RNDr. Katarína Reiffová, PhD.

Date of last modification: 18.02.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/BZj/19	**Course name:** Animal Biology

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚBEV/CYT1/15 and ÚBEV/PMZ/10 and ÚBEV/FZ1/10 and ÚBEV/ZO1/03 and ÚBEV/ZOO1/03 and ÚBEV/HIS1/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 22

A	B	C	D	E	FX
9.09	27.27	31.82	22.73	9.09	0.0

Provides:

Date of last modification: 19.02.2025

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/FZ1/10	**Course name:** Animal Physiology

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

Number of ECTS credits: 7

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚBEV/HIS1/15 or ÚBEV/HISE1/15

Conditions for course completion:
Active participation on practicals.
Passing the test in recognition of microscopical preparations (min. 50% of correct identification and description)
Passing the final examination of knowledge and practical skills from the content of practicals.
Oral examination.

Learning outcomes:
To provide students with basic knowledge on the physiological processes in animals on different levels of the phylogenesis. Learn the principles of their control, aimed to secure the inner integrity of the animal and to its adaptation to the environment. To point out the unity of the structure (on the molecular, cellular, tissue and organ levels) and of the functions of the body.

Brief outline of the course:
1. Basic physiological principles. Homeostatic mechanisms.
2. Physiology of blood and hemopoetic organs.
3. Physiology of respiration.
4. Thermoregulation.
5. Physiology of cardio-vascular system.
6. Physiology of the gastro-intestinal system.
7. The functions of the liver.
8. Physiology of nutrition and the energetic metabolism. The water and mineral household.
9. General neurophysiology.
10. Sensory and motoric functions of the nervous system. Associative functions of the brain.
11. Physiology of excretion. The work of the muscles.
12. Sensory physiology.
13. Hormonal regulation. Physiology of reproduction.
12. Sensory physiology.

Recommended literature:
Varder, A. J., Sherman, J. H., Luciano, D. S.: The mechanisms of body functions, McGraw-Hill, 1990
Schmidt, R. F., Thews, G.: Human Physiology, Springer-Verlag, 1989

R.W.Hill, R.Wyse, M.Anderson : Animal Physiology, Sinauer Assoc., 2008

Course language:

Notes:

Course assessment
Total number of assessed students: 1629

A	B	C	D	E	FX
8.96	16.7	21.73	23.51	23.27	5.83

Provides: doc. RNDr. Monika Kassayová, CSc., doc. RNDr. Bianka Bojková, PhD.

Date of last modification: 21.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ SBPa/15	**Course name:** Bachelor Thesis 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: 4	
Recommended semester/trimester of the course: 5.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 223	

abs	n
99.55	0.45

Provides:	
Date of last modification:	
Approved: doc. RNDr. Andrej Mock, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ SBPb/15	**Course name:** Bachelor Thesis 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: 4	
Recommended semester/trimester of the course: 6.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 204

abs	n
96.08	3.92

Provides:	
Date of last modification:	
Approved: doc. RNDr. Andrej Mock, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ BPO/14	**Course name:** Bachelor Thesis and its Defence

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 389

A	B	C	D	E	FX
53.21	26.22	15.94	3.08	1.54	0.0

Provides:

Date of last modification: 07.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ BAKP/23	**Course name:** Bakalársky projekt
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 6s **Course method:** present	
Number of ECTS credits: 1	
Recommended semester/trimester of the course: 3.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides: RNDr. Jana Vargová, PhD.
Date of last modification: 23.02.2023
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ SMP/10	**Course name:** Basic statistics for sciences

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

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:
Given on the basis of individual working out of a data evaluation project.

Learning outcomes:
Understanding basics of descriptive statistics used in sciences.

Brief outline of the course:
• Data types. Frequencies.
• Measures of location and variability. Quantiles.
• Basic probability distributions.
• Point and interval estimators.
• Testing of basic statistical hypotheses. Power of tests.
• Nonparametric tests.
• Measuring the strength of a dependence.
• Fundamentals of regression.

Recommended literature:
• Wonnacott, Wonnacott: Introductory Statistics, 5th ed., Wiley 1990
or any other basic statistics textbook.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 156

A	B	C	D	E	FX
7.05	10.26	12.82	19.23	36.54	14.1

Provides: prof. RNDr. Ivan Žežula, CSc., doc. RNDr. Daniel Klein, PhD.

Date of last modification: 28.03.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ BCHU/03	**Course name:** Biochemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: I.

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

Conditions for course completion:
Successful completion of the exam, which consists of two parts: (i) written and (ii) oral part. The student passes the exam if he / she obtains at least 60% of the points in the written part and at the same time adequately answers the asked questions in the oral part.

Learning outcomes:
Gain knowledge of: (i) the basic building blocks of biomacromolecules (proteins, DNA, RNA, fats and sugars) and their properties, (ii) the basic biochemical processes that take place in living organisms, (iii) the way energy is produced and used in cells.

Brief outline of the course:
1. Protein Structure and Function, Exploring proteins.
2. DNA and RNA and the Flow of Genetic Information, Exploring genes.
3. Enzymes: Basic Concepts and Kinetics, Catalytic Strategies and Regulatory Strategies.
4. Carbohydrates (Monosaccharides, Disaccharides, Polysaccharides – Functions and Properties).
5. Lipids and Cells Membranes, Membrane Channels and Pumps.
6. Metabolis: Basic Concepts and Design, Signal-Transduction Pathways.
7. Glycolysis and Gluconeogenesis, Glycogen Metabolism.
8. The Citric Acid Cycle and Glyoxylate Cycle.
9. Oxidative Phosphorylation, The Light Reactions of Photosyntesis.
10. The Calvine Cycle and the Pentose Phosphate Pathway.
11. Fatty Acids Metabolism, Urea Cycle.
12. DNA Replication, Transcription (RNA Synthesis).
13. Protein Synthesis & Degradation, the Integration of Metabolism.

Recommended literature:

Course language:

Notes:

Course assessment Total number of assessed students: 1294					
A	B	C	D	E	FX
19.32	16.46	20.94	20.48	20.02	2.78
Provides: prof. RNDr. Erik Sedlák, DrSc., RNDr. Nataša Tomášková, PhD.					
Date of last modification: 14.11.2021					
Approved: doc. RNDr. Andrej Mock, PhD.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ PBC2/99	**Course name:** Biochemistry Practical

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

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

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

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

13. Final evaluation of students.

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

Course language:
Slovak

Notes:
Teaching is carried out in person.

Course assessment
Total number of assessed students: 984

A	B	C	D	E	FX
57.72	25.91	9.96	4.67	1.52	0.2

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

Date of last modification: 17.08.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ BFP1/99	**Course name:** Biophysical principles of physiological processes
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: 6.	
Course level: I.	
Prerequisities:	
Conditions for course completion: Oral examination.	
Learning outcomes: To provide the students with knowledge of basic biophysical principles of physiological processes in animals	
Brief outline of the course: 1. Fundamentals of information theory and information processes in biology. 2. Theory of regulation and control and its role in physiology. 3. Basic principles of thermodynamics. 4.Theory of systems and its significance in biology. 5. Biophysical mechanisms of cell excitability and of the propagation of neuronal signals. 6. .Properties of biological membranes and of transport processes. 7. Energetics and kinetics of muscle contraction. 8. Biomechanics of bones and joints. 9. Physical principles of blood circulation, action of heart and lungs. 10. Physiological acoustics. 11. Physical principles of light perception. 12.Biological effects of ionizing radiation. 13. Biologogical effects of non-ionising radiation.	
Recommended literature: Berne, L.: Principles of physiology. Mosby, 1990 S.Lehnert: Biomolecular action of ionizing radiation. Taylor and Francis, 2008 Schmidt: Fundamentals of Sensory Physiology. Springer, Berlín, 1986.	
Course language:	
Notes:	

Course assessment Total number of assessed students: 198					
A	B	C	D	E	FX
8.59	20.2	23.23	15.15	22.22	10.61
Provides: RNDr. Terézia Kisková, PhD.					
Date of last modification: 21.09.2021					
Approved: doc. RNDr. Andrej Mock, PhD.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ BS1/03	**Course name:** Biostatistics

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: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
Active participation on practicals, including successful solving of the assigned numerical examples.
Passing the continual testing.
To absolve the final written test with at least 50% of the maximal score.

Learning outcomes:
To provide the students with knowledge on basic principles of statistic methods used in biology and their scope of application in statistical evaluation of experimental results, and with the principles of the design of experiments, as well.

Brief outline of the course:
1. Sources and theoretical background of biostatistics.
2.Basic principles of the probability theory. Descriptive statistics: variables, measures of mean value and variability of data.
3. Theoretical and empirical distributions. Experimental sampling from the normal distribution.
4. Reliability of estimations. Testing of hypotheses. I.-. and II.-type errors.
5. Statistical sampling. Comparison of two groups.
6. One-way and multiple analysis of variance. Tests for multiple comparisons.
7. Regression analysis.
8. Correlations.
9. Non-parametrical methods.
10. Design and planning of biological experiments.
11. Aanalysis of time series.
12. Analysis of qualitative data.
13. One- and multidimensional methods, use of computer software.

Recommended literature:
Hassard, T. H.: Understanding biostatistics. Mosby Year Book, 1991
Snedecor,G.W., Cochran,W.G.: Statistical methods. The Iowa state university, Ames, 1972.
R.Forthofer, E.S.Lee, M.Hernandez: Biostatistics. A guide to design, analysis and dicovery. Elsevier, Amsterdam, 2007

Course language:

Notes:

Course assessment
Total number of assessed students: 294

A	B	C	D	E	FX
4.42	9.18	19.73	25.17	32.65	8.84

Provides: RNDr. Ivana Ihnatová, PhD.

Date of last modification: 21.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/BO1/03	**Course name:** Botany 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: 5

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1949

A	B	C	D	E	FX
14.16	19.86	25.4	20.01	18.11	2.46

Provides: prof. RNDr. Martin Bačkor, DrSc., doc. RNDr. Michal Goga, PhD., prof. Dr. rer. nat. Marko Sabovljević, Dr. rer. nat., RNDr. Dajana Kecsey, PhD.

Date of last modification: 05.11.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ BOT1/03	**Course name:** Botany 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: 5

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:
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Learning outcomes:
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Brief outline of the course:
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Recommended literature:
Mártonfi P.: Systematika cievnatých rastlín, 4. vydanie. - Vydavateľstvo UPJŠ, Košice, 2013.
Judd W. S., Campbell Ch. S., Kellogg E. A. & Stevens P. F., Donoghue M. J.: Plant Systematics. A phylogenetic Approach, 4th ed. - Sinauer Associates, Sunderland, 2016.
Simpson M. G.: Plant Systematics. - Elsevier - Academic Press, 2019.
Dostál J., Červenka M.: Veľký kľúč na určovanie rastlín I. a II. - SPN, Bratislava, 1991 a 1992

Course language:

Notes:

Course assessment
Total number of assessed students: 1566

A	B	C	D	E	FX
11.11	12.45	17.18	19.92	24.84	14.5

Provides: prof. RNDr. Pavol Mártonfi, PhD., RNDr. Matej Dudáš, PhD.

Date of last modification: 29.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

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

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

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

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

Course language:
SK - slovak

Notes:
The subject is carried out in person or, if necessary, remotely using the online platform Big Blue Button (BBB). The form of teaching is specified by the teacher at the beginning of the semester and updated continuously.

Course assessment Total number of assessed students: 1805					
A	B	C	D	E	FX
26.81	19.0	21.99	19.39	11.58	1.22
Provides: doc. RNDr. Miroslav Almáši, PhD., Mgr. Nikolas Király, PhD.					
Date of last modification: 15.11.2021					
Approved: doc. RNDr. Andrej Mock, PhD.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

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

Learning outcomes:

Brief outline of the course:

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

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

Notes:

Course assessment
Total number of assessed students: 303

A	B	C	D	E	FX
45.21	21.12	17.49	7.59	5.94	2.64

Provides: Mgr. Barbara Mitríková, Mgr. Viktória Mária Slovenská

Date of last modification: 06.02.2025
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

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

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

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

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

Course language:

English language, level B2 according to CEFR.

Notes:

Course assessment
Total number of assessed students: 446

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

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

Date of last modification: 08.02.2025

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KGER/ NJKG/07	**Course name:** Communicative Grammar in German Language

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

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

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

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

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

Course language:
German, Slovak language

Notes:

Course assessment
Total number of assessed students: 58

A	B	C	D	E	FX
62.07	10.34	8.62	3.45	8.62	6.9

Provides: Mgr. Ulrika Strömplová, PhD.

Date of last modification: 13.08.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ PMZ/10	**Course name:** Comparative Animal Morphology

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: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
Lectures and practical exercises, original drawing of some parts of animal body or it derivates, examination.

Learning outcomes:
The student will acquire basic knowledge about the principles of building the animal body from the simplest protostomian invertebrates to vertebrates. Despite the huge taxonomic diversity of animals, their bodies can be interpreted by a relatively limited number of building principles that correspond to the systematic position of the examined animal and functional adaptations to the environment and way of life. The subject examines the structure of the body at the level of organs and organ systems, by applying the method of comparison it seeks general principles and also peculiarities. It is also important to get acquainted with the principal terms, which the student will use in the spectrum of other study subjects.

Brief outline of the course:

Recommended literature:
Fretter, V., Graham, A., 1976: A Functional Anatomy of Invertebrates. Academic Press, London, New York, San Francisco, 589 pp.
Kardong, K. V., 2002: Vertebrates. Comparative anatomy, function, evolution. 3rd ed., Mc-Graw-Hill, New York.
Pough, F. H., Janis, Ch. M., Heiser, J. B., 2008: Vertebrate Life. Prentice Hall, Inc., 752 pp. 8th edition.
Ruppert, E. E., Fox, R. S., & Barnes, R. D., 2004: Invertebrate zoology: a functional evolutionary approach. Belmont, CA: Thomas-Brooks/Cole.

Course language:

Notes:
The study of the animal body structure of animals is a very old scientific discipline that has accumulated a vast amount of detailed knowledge. Comparing them is not only a way to put the knowledge into a comprehensive system, but mainly a way to find general anatomical rules that are tied to one of the animal's phylogenetic linneage or have general validity and reveal the degree of phylogenetic relationship of animals or the degree of adaptation to the environment

and a way of life. A brief summary of the phylogeny of the animal body building plan and organ systems using the knowledge of classical and modern comparative morphological approach, supported by knowledge of embryology and molecular data for interpretation of the phenotype are the content of this course.

Course assessment

Total number of assessed students: 2341

A	B	C	D	E	FX
19.22	19.39	25.16	20.29	11.62	4.31

Provides: doc. RNDr. Andrej Mock, PhD., RNDr. Andrea Rendošová, PhD., Mgr. Dalibor Uhrovič, PhD.

Date of last modification: 19.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/OPR/12	**Course name:** Conservation Biology

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Mandatory participation in lectures, completion of two semestral written examinations, oral examination.

Learning outcomes:
The main goal of the subject is to introduce term biodiversity, principal threats and conservation of species, populations, communities and ecosystems.

Brief outline of the course:
Fundamental and origin of conservation biology. Different levels of biodiversity, biodiversity hotspots on Earth. Economic value of biodiversity as the principal argument of nature conservation. Factors leading to biodiversity threats. Extinctions and problems of small populations. Conservation of populations and species, conservation programs and strategies. Classification and management of protected areas, conservation outside the protected areas. Sustainable development, education to conservation of nature.

Recommended literature:
Primack R.B., 2010: Essentials of conservation biology. Sinauer Associates, 1-603

Course language:

Notes:

Course assessment
Total number of assessed students: 811

A	B	C	D	E	FX
73.61	15.91	6.54	2.84	0.49	0.62

Provides: prof. RNDr. Ľubomír Kováč, CSc.

Date of last modification: 14.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ PPR/15	**Course name:** Cultivation of experimental plants

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: 4., 6.

Course level: I.

Prerequisities:

Conditions for course completion:
1. Active participation at practical lessons. One apologised absence in maximal duration of 2 lessons is possible. In the case of a longer justified absence, in agreement with the teacher an alternative form of practical exercises is necessary to implement.
2. Before the practical exercises, students have to study the theses presented in the introductory lecture according to the assignment. The schedule of the practical exercises topics together with the relevant materials are given to the students at the beginning of the semester in the introductory lecture.
3. Completed realized assignments of practical exercises and realization of own cultivation in domestic conditions connected with detailed documentation is a condition for granting the final evaluation.
Any changes or modifications to the conditions for completing the course due to the COVID19 pandemic, or other serious reasons, are continuously published on the electronic bulletin board of the subject

Learning outcomes:
Students will practically master various techniques of cultivating higher and lower plants. The techniques are performed in sterile and non-sterile conditions. After completing the practical classes, students will gain information and experience, thanks to which they can independently carry out the cultivation of plants using not only in the implementation of diploma theses, but also in general practice.

Brief outline of the course:
1. Basic terms - plant model organisms, seeds, substrates, methods of cultivation
2. Cultivation of higher plants on solid media in sterile conditions - preparation of gel substrates,
3. Transfer of seeds and plant individuals to the gel media
4. Cultivation of higher plants on liquid media - hydroponics - preparation of liquid media
5. Transfer of plant individuals to the gel media
6. Cultivation of lower plants in sterile solid, preparation of gel media,
7. Transfer of microspic algae culture to the media
8. Cultivation of lower plants in sterile liquid media, preparation of media, transfer microscopis algae to liquid media

9. Cultivation of higher plants in various solid substrates in the laboratory
10. Cultivation of higher plants in field conditions.
11. Cultivation of pharmaceutically important species - excursion
12. Semestral work - Cultivation of plants in domestic conditions conditioned by documentation
13. Presentation of semestral works, evaluation realized cultivations

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 123

abs	n
99.19	0.81

Provides: Mgr. Andrea Pogányová, PhD.

Date of last modification: 02.11.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ CYT1/15	**Course name:** Cytology

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
Practicals graduation (without absence); Two written tests graduation (min. 70 % fruitfulness of each); Oral examination

Learning outcomes:
To provide the students with knowledge of basic principles of cell microscopic and submicroscopic structure and function.

Brief outline of the course:
Lectures:
1.) Cell theory. Cell. 2.) Organization of living systems. 3.) Biological membranes. 4.) Transfer of substances across membranes. 5.) Cell wall of plant cells. 6.) Surface structures of cells. Extracellular matrix. Cell movement. 7.) Intercellular connections. 8.) Cytoskeleton. 9.) Cell nucleus. 10.) Mitochondria and cellular metabolism. 11.) Plastids and vacuoles. 12.) Ribosomes. Endoplasmic reticulum. Golgi apparatus. Lysosomes. 13.) Differentiation, aging and cell death, pathological changes in cells.
Exercises:
1.) Safety at work in a cytomorphological laboratory. Conditions for successful completion of exercises. 2.) Basics of optics. Origin and construction of the image with a magnifying glass and a microscope. 3.) Microscopic technique. 4.) Shape and size of cells. 5.) Principle of fluorescence and confocal microscopy. 6.) Control test. Vacuole. 7.) Cytoplasm movement. 8.) Nucleus and nucleolus. 9.) Cytoplasmic membrane. 10.) Osmotic processes. 11.) Cell inclusions. 12.) Cell walls of plant cells. 13.) Cell counting. Control test.

Recommended literature:
K.Kapeller, H.Strakele: Cytomorfológia. Osveta Martin, 1999
M.Babák, J.Šamaj: Cytológia. Univerzita Komenského Bratislava, 2002
Alberts B., Bray D., Johnson A., Lewis J.: Základy buněčné biologie. Espero Publishing, 2003
Campbell N. a Reece J.: Biologie. Computer Press, 2006
Kleban J., Mikeš J., Jendželovská Z., Jendželovský R., Fedoročko P.: Cytológia pracovný zošit na praktické cvičenia, 2018

Course language:

Notes:

Course assessment
Total number of assessed students: 1150

A	B	C	D	E	FX
12.26	19.04	28.52	22.52	16.7	0.96

Provides: doc. RNDr. Rastislav Jendželovský, PhD., RNDr. Zuzana Jendželovská, PhD., RNDr. Mgr. Martin Majerník, PhD., RNDr. Viktória Dečmanová, PhD., Mgr. Gabriela Blašková

Date of last modification: 19.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

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

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

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

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

Recommended literature:

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

Course language:
English, level B2 (CEFR)

Notes:

Course assessment
Total number of assessed students: 3246

A	B	C	D	E	FX
38.63	26.31	16.3	9.52	7.18	2.06

Provides: Mgr. Viktória Mária Slovenská

Date of last modification: 06.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ EF1/03	**Course name:** Experimental methods in physiology

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:
Regular attendance at classes.
Active participation in practices.
Elaboration of assigned tasks.
Successful completion of the oral exam.

Learning outcomes:
Students will learn:
- the principles of breeding laboratory animals and their proper treatment and handling,
- the theory of experimental work and correct experimental habits,
- an overview of experimental methods used in physiological laboratories, with a special focus on methods used in neurophysiology and electrophysiology,
- the other aspects of the experimenter's work in a biological experiment - fundraising, grant systems, writing publications, career promotion,
- the conditions for experimental work in a multimethodic experimental institute.

Brief outline of the course:
1. Laboratory animals - history, the most known species, environment and care, classification in terms of genetic and microbiological, statistics of use, regulations, sources of information.
2. Video on animal manipulation, discussion; visit of the vivaria in UPJŠ and NbU BMC SAS, acquaintance with its system, practical demonstration of manipulation with laboratory rat
3. Theory of experiment - types of studies, basic phases in experimental work, experimental design, hypothesis, experimental and control groups, etc ...
4. Practical methods of research in biology. Characteristics of behavioral, electrophysiological and imaging (CT, MRI, fMRI, PET, ...) methods.
5. Electrophysiology - membrane potential, action potential, synapse, postsynaptic potentials.
6. Electrophysiology - different types of recordnings - field potentials (EEG, ECG, EMG, evoked potentials), unit activity (extracellular, intracellular), tpatch-clamp, principles and configurations.
7. Behavioral methods in a biological experiment - mazes, open field, BBB score, hot plate, pain, reward and punishment, swimming pool, ... demonstration of the experiment in Morris pool
8. Technical conditions for recording of electrical signals of tissue - electrodes, amplifier, filters, A/D conversion, sampling, stimulation, evaluation of signals and their parameters, etc.

9. Demonstration experiments - measurement of EEG, ECG, EMG, evoked potentials
10. Forms of scientific work: from diploma thesis to doctoral thesis; grant system; doctoral student, postdoc, principal investigator; titles and ranks; writing a publication - sources, references,… etc.
11. Use of computers in experiment: Searching in databases, Image analysis - basic concepts of digital image, basic operations with images, basic principles of image analysis and available programs (Image tools, ImageJ, Ellipse)
12. Analysis of scientific article (basic parts - Introduction, Materials and methods, Results, Discussion) - how the experiment was built, experimental and control groups, selected methods, hypothesis, confirmation or negation, discussion
13. Excursion in laboratories in the Institute of Neurobiology BMC SAS.

Recommended literature:

Brain Facts, a primer on the brain and nervous system, published by the Society for Neuroscience, 2018
Mysliveček,J., Myslivečková-Hassmannová,J.: Nervová soustava. Funkce, struktura a poruchy činnosti. Avicenum, Praha, 1989.
Schmidt,R.,F.: Fundamentals of Neurophysiology. Springer Verlag, New York, Berlin, Heidelberg, 1985.
Greenstein,B., Greenstein,A.: Color Atlas of Neuroscience. Thieme. Stuttgart, New York, 2000.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 223

A	B	C	D	E	FX
45.29	31.84	16.59	4.48	1.35	0.45

Provides: RNDr. Ján Gálik, CSc.

Date of last modification: 13.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ ETB1/99	**Course name:** Experimental techniques in Biology
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 4 **Per study period:** 56 **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course: 6.	
Course level: I.	
Prerequisities: ÚBEV/CYT1/15	
Conditions for course completion: active participation on practicals/seminars, exam	
Learning outcomes: To provide the students with the knowledge of basic experimental techniques in biology.	
Brief outline of the course: 1. Course management. Laboratory safety. 2. Molecular markers; Polymerase chain reaction (PCR), RT-PCR, Real-Time PCR). 3. Molecular cytology – Flow cytometry – principles and application in cell biology. 4. Work in aseptic conditions (in vitro); work with cell lines – subculturing, staining, cell counting, MTT test. 5. Laboratory animals, strains and inbreed lines; Breeding and manipulation with animals. 6. Manipulation with laboratory animals; Behavioural tests. 7. Animal dissection; Anatomy of animals. 8. Surgery in experimental research. 9. Fluorescence and confocal microscopy in experimental research. 10. Fieldwork; Botanical fieldwork and follow-up laboratory assessment. 11. Use of scientific literature. Presentation of own results. 12. Transgenic organisms in biological research. 13. Conditional Gene Knockout.	
Recommended literature: Zutphen, L. F. M., Baumans, V., Beynen, A. C.: Principles of Laboratory Animal Science. Elsevier, Amsterdam, 1993	
Course language: English for Erasmus students	
Notes:	

Course assessment
Total number of assessed students: 268

A	B	C	D	E	FX
55.6	13.43	13.06	4.1	12.69	1.12

Provides: RNDr. Ján Košuth, PhD., RNDr. Anna Alexovič Matiašová, PhD., Mgr. Vladislav Kolarčik, PhD., univerzitný docent, doc. RNDr. Juraj Ševc, PhD., doc. RNDr. Rastislav Jendželovský, PhD., RNDr. Natália Pipová, PhD., RNDr. Jana Vargová, PhD.

Date of last modification: 15.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/TCZ/03	**Course name:** Fieldwork from zoology

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:
The condition for successful completion of the field exercises in zoology is active participation in the specified field trips, submission of a collection of 10 correctly identified species of animals or their resident characters, processing of the assigned task and presentation of the results of the task at the final student conference.

Learning outcomes:
Students will see and practically try different methods of collecting, capturing and observing different groups of animals in nature. They will try identifying animals using identification keys. Students will try processing a small scientific project and presenting the obtained results in front of other course participants.

Brief outline of the course:
Study of fauna directly in the field in different habitats of Slovakia; observation, collection, recording, conservation and determination. Getting to know the representatives of fauna connected with the principles of nature conservation.

Recommended literature:
Any literature (identification keys, animal atlases) for identifying different groups of invertebrates and vertebrates. Electronic applications for identifying animals from photographs and voice recordings.

Course language:

Notes:

Course assessment
Total number of assessed students: 1163

abs	n
99.48	0.52

Provides: RNDr. Peter Ľuptáčik, PhD., doc. RNDr. Andrej Mock, PhD., doc. RNDr. Marcel Uhrin, PhD., univerzitný profesor

Date of last modification: 21.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ TCB1/03	**Course name:** Fieldworks from Botany
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 5d **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 2.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes: .	
Brief outline of the course: .	
Recommended literature: .	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 1490

abs	n
99.93	0.07

Provides: prof. RNDr. Pavol Mártonfi, PhD., Mgr. Vladislav Kolarčik, PhD., univerzitný docent
Date of last modification: 15.12.2021
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/VACH/10	**Course name:** General and Inorganic Chemistry

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 462

A	B	C	D	E	FX
22.29	24.89	28.35	18.4	5.19	0.87

Provides: prof. RNDr. Zuzana Vargová, Ph.D., Mgr. Michaela Rendošová, PhD.

Date of last modification: 24.11.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/VB1/01	**Course name:** General botany

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚBEV/CYT1/15

Conditions for course completion:
Two tests during the semester, oral examination

Learning outcomes:
The subject enables to understand the structure and function of plant cells, tissues and organs and to enhance student's ability to describe the biological role of plants for life on earth. Students will acquire skills for simple preparation of native microscopic slides, for working with a light microscope and demonstration of observed plant structures in relation to the lectured theoretical topics.

Brief outline of the course:
The structure and function of plant cells and tissues. Plant organs, their structure, function, shape and organization. Plant reproduction and grounding in embryology. Basic information and terms that are necessary for understanding of relationship between internal structure and functions of organs and functions of plant organism en bloc. 1. Contents of General botany, significant evolutionary adaptations of plants; 2. Plant cell cytology. Basic cell organelles; 3. Plastids, cell wall; 4. Histology, plant tissue systems, meristematic tissues; 5. Dermal and ground tissues; 6. Vascular tissues; 7. Plant organs, root; 8. Stem; 9. Leaf; 10. Flower, Inflorescence; 11. Pollination and fertilisation in plants; 12. Sexual and apomictic reproduction of plants. Seeds and fruits; 13. Alternation of generations and life cycles of bryophytes and vascular plants.

Recommended literature:
Bobák, M. a kol.: Botanika. Anatómia a morfológia rastlín. SPN, Bratislava, 1992;
Vinter V.: Rostliny pod mikroskopem. Základy anatómie cévnatých rostlin. Univerzita Palackého v Olomouci, Olomouc, 2009;
Lux, A. (ed.) Obrazový průvodce anatomií rostlin, Academia, Praha, 2017.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 1277

A	B	C	D	E	FX
16.29	27.02	28.03	16.84	8.46	3.37

Provides: prof. RNDr. Pavol Mártonfi, PhD., Mgr. Vladislav Kolarčik, PhD., univerzitný docent, PaedDr. Andrea Lešková, PhD.

Date of last modification: 29.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/GE1/10	**Course name:** Genetics

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

Number of ECTS credits: 7

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities: ÚBEV/MOB1/15 or ÚBEV/MB1/01

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1715

A	B	C	D	E	FX
19.18	15.57	15.98	14.34	19.71	15.22

Provides: doc. RNDr. Katarína Bruňáková, PhD., RNDr. Miroslava Bálintová, PhD., RNDr. Linda Petijová, PhD.

Date of last modification: 15.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ LR1/03	**Course name:** Healing Plants

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: 5.

Course level: I., II.

Prerequisities:

Conditions for course completion:
1. Participation in an excursion in the area of the Botanical Garden focused on practical demonstrations of medicinal plants, methods of their cultivation and collection.
2. Written exam, which must be passed at least 50%.

Learning outcomes:
Get an overview of the most important medicinal plants in Slovakia. Students will learn to identify medicinal plants. In addition, they will learn about the possibilities of growing medicinal plants, the substances contained in these plants and their practical use.

Brief outline of the course:
Introduction to the study of medicinal plants.
Production, processing and preservation of medicinal plants.
Collection of medicinal plants
Secretory structures of plants
Synthesis of biologically active metabolites in plants - secondary metabolism
Classification of constituents and their effects
Medicinal plants from the families Papaveraceae, Droseraceae, Hypericaceae, Rosaceae
Medicinal plants from the families Malvaceae, Ericaceae.
Medicinal plants from the families Scrophulariaceae, Plantaginaceae, Lamiaceae.
Medicinal plants from the families Caprifoliaceae, Apiaceae, Valerianaceae.
Medicinal plants from the families Asteraceae, Equisetaceae, Ginkgoaceae.
Practical use of medicinal plants.
Poisonous plants.

Recommended literature:

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 464

A	B	C	D	E	FX
31.25	26.08	18.53	9.7	7.54	6.9

Provides: RNDr. Matej Dudáš, PhD.

Date of last modification: 10.03.2025

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ HIS1/15	**Course name:** Histology
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 3 / 2 **Per study period:** 42 / 28 **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 2.	
Course level: I.	
Prerequisities: ÚBEV/CYT1/15 and ÚBEV/ACL/03	
Conditions for course completion: Oral examination	
Learning outcomes: To provide the students with knowledge of basic morphology of tissues of animals.	
Brief outline of the course: 1. Epithelium and glands. 2. Connective tissue. 3. Cartilage. Bone. 4. Muscle. 5. Nervous Tissue. 6. Blood and hemopoiesis. 7. Circulatory system. Lymphoid system. 8. Endocrine system. 8. Respiratory system. Integument. 9. Digestive system. 10. Urinary system. 11. Female reproductive system. 12. Male reproductive system. 13. Nervous system. Special senses.	
Recommended literature: Michel H. Ross, Wojciech Pawlina: Histology, Lippincott Wiliams & Wilkins, 2011 Renate Lullmann-Rauch: Histologie, Grada, 2012 Gartner, L.P., Hiatt, J.L.: Color Texbook of Histology. W.B. Saunders Company, Philadelphia, 1997 Juanqueira, L.C., Carneiro, J., Kelley, R.O.: Basic Histology. Prentice Hall International Inc., Apleton & Lange, 1997	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 250

A	B	C	D	E	FX
26.4	16.8	19.6	13.2	18.4	5.6

Provides: RNDr. Anna Alexovič Matiašová, PhD., doc. RNDr. Juraj Ševc, PhD.

Date of last modification: 11.01.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/SBD/08	**Course name:** History of Biology 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: 3

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Introduction to history of science, especially biology

Brief outline of the course:
Introduction to history of biology (and related scientific areas) from ancient times, through middle ages to present.

Recommended literature:
Magner, L.N. (2002) A history of the life sciences. Marcel Dekker, Inc.

Course language:

Notes:

Course assessment
Total number of assessed students: 508

A	B	C	D	E	FX
97.64	2.17	0.2	0.0	0.0	0.0

Provides: prof. RNDr. Martin Bačkor, DrSc.

Date of last modification: 03.05.2015

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ ACL/03	**Course name:** Human Anatomy

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:
1. active participation on Anatomy lectures, max. 3 absences per semester
2. two written exams (20 points each) during semester, results of written exams contribute to the overall ranking
3. elaboration and presentation of the seminar paper (max. 5 points to overall ranking)
4. written exam (test, 55 points max.) during winter exam period; 3 regular exam dates (unlimited number of students) + 1 date for correction (for students, which failed in regular exam dates). Final grade will be calculated based on the total sum of earned points from written exams (20+20), seminar paper (5) and test (55). Grading scale: A (100-91 points), B (90.5-81), C (80.5-71), D (70.5-61), E (60.5-51), FX (50.5 and less)

Learning outcomes:
After successful completion of the lectures, student masters the systemic human anatomy and has an accurate idea about the arrangement of the individual organs in particular organ system, or across various systems. Student understands the function and basic physiology of particular organs in human body in context of both; evolution and processes occurring in cells and tissues. Successful completion of the lectures prepare students for further study of histology, animal physiology, comparative morphology, immunology, etc.

Brief outline of the course:
1. Anatomical terminology
2. The skeletal system
3. The muscular system
4. The respiratory system
5. The gastrointestinal system
6. The urinary system
7. The male reproductive system
8. The female reproductive system
9. The circulatory system
10. The lymphatic system
11. The immune system
12. The nervous system

13. The sensory organs

Recommended literature:

Miklošová M.: Anatómia, vysokoškolská učebnica, UPJŠ, Equilibria, Košice, 2011
Ševc, J., Mochnacký, F.: Anatomické termíny pre jednoodborové a medziodborové štúdium biológie, UPJŠ, e-book (https://unibook.upjs.sk/sk), 2020
Kluchová, D. a kol.: Anatómia trupu a končatín, UPJŠ, Equilibria, Košice, 2015
K. S. Saladin: Anatomy and Physiology: The Unity of Form and Function, Mc Graw-Hill; 3rd edition, 2004
Mráz, P. a kol.: Anatómia ľudského tela 1-3, Slovak Academic Press, 2015-2021

Course language:

Notes:

Course assessment

Total number of assessed students: 2083

A	B	C	D	E	FX
6.48	16.99	26.64	24.53	21.89	3.46

Provides: RNDr. Anna Alexovič Matiašová, PhD.

Date of last modification: 07.09.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ HDR1/99	**Course name:** Hydrobiology

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: 3., 5.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
The transfer of knowledge of hydrobiology takes place in the form of lectures, seminars, field trips and independent work of students in the field according to the instructions of the teacher.
Teaching is focused on understanding the basic dynamics of abiotic and biotic relationships, conditions and interactions in different types of freshwater environments. It notes current issues such as biodiversity loss, degradation of aquatic habitats and drinking water sources, water loss in the country of pollution, historical degradation of watercourses by regulations, migration barriers and pollution, wetland extinction, acquaints students with the starting points of renaturalization and ecosystem revitalization. Water is the key to understanding the functioning of the landscape, living organisms are an indispensable part of the self-cleaning, productive and other properties of water, on which life depends on our planet. The climate crisis is opening up these problems with new urgency.

Recommended literature:
Dobson, M., Frid, C. Ecology of Aquatic Systems. Oxford University Press, 2009
Wetzel, R.G..: Limnology. Academic Press. 3rd Edition, 2001
Wetzel, R.G.: Limnological analyses. Springer Verl., 3rd Edition, 2000

Course language:

Notes:

Course assessment
Total number of assessed students: 236

A	B	C	D	E	FX
44.49	20.34	16.53	17.37	1.27	0.0

Provides: doc. RNDr. Andrej Mock, PhD., Mgr. Dalibor Uhrovič, PhD.

Date of last modification: 18.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ VEK1/03	**Course name:** Introduction to Ecology
Course type, scope and the method: **Course type:** Lecture **Recommended course-load (hours):** **Per week:** 3 **Per study period:** 42 **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course: 5.	
Course level: I., II.	
Prerequisities:	
Conditions for course completion: oral examination	
Learning outcomes: Fundamental parameters and relations in ecological science. Abiotic, biotic and anthropogenic factors in air, aquatic and terrestrial/soil environment. Autecology, Demecology and Synecology. Ecosystem and Nature Protection.	
Brief outline of the course: Ecological factors and relations in environment (air, water, soil); influence of ecological factors on individuals (morphological adaptations, behavioral reactions); populations and communities; ecosystems (impact assessment); conservation and biodiversity. 1. Basic ecological terms. 2. Characterisation of the basic ecological factors (light, temperature, water). 3. Air environment (composition of atmosphere, physical and chemical factors, air pollutants, organisms and their adaptations in air environment). 4. Aquatic environment (water properties physical and chemical factors, gases in water, water pollutants, eutrophication and saprobity, aquatic organisms). 5. Soil environment (physical and chemical properties, soil profile, humus layer, soil pollutants, soil organisms and their adaptations). 6. Characterization of Populations, structure and ppuatin dynamics. 7.Biocenoses and biotops. 8. Qualitative and quantitative community characteristics. 9. Ecosystems. 10. Biomes and their characteristics, 11. Bidiversity-factors affecting biodiversity, Species-Area relationships. 12. Biodiversity protection.13. Biospheric cycles.	
Recommended literature: Begon, M., Harper, J. L., Townsend, C. L.: Ecology: individuals, populations, and communities. Blackwell Sci. Publ., 1990	
Course language:	
Notes:	

Course assessment Total number of assessed students: 1871					
A	B	C	D	E	FX
21.65	17.42	24.85	17.1	11.65	7.32
Provides: RNDr. Natália Raschmanová, PhD., univerzitná docentka					
Date of last modification: 16.03.2023					
Approved: doc. RNDr. Andrej Mock, PhD.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ULP/08	**Course name:** Introduction to Laboratory Work

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 18s
Course method: present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 541

A	B	C	D	E	FX
63.22	27.17	7.39	1.48	0.37	0.37

Provides: RNDr. Martin Vavra, PhD., RNDr. Miroslava Matiková Maľarová, PhD.

Date of last modification: 23.11.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: Dek. PF UPJŠ/USPV/13	**Course name:** Introduction to Study of Sciences
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week: Per study period:** 12s / 3d **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 1.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 2369

abs	n
90.12	9.88

Provides: doc. RNDr. Marián Kireš, PhD.
Date of last modification: 30.08.2022
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KKF/LB/07	**Course name:** Latin for Students of Biology

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: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 630

A	B	C	D	E	FX
20.63	19.68	24.76	14.44	15.87	4.6

Provides: Mgr. Alexandra Kavečanská, PhD.

Date of last modification: 17.05.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ eMTSa/21	**Course name:** Mathematics I for science

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: 7

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1

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

Provides: doc. RNDr. Miroslav Ploščica, CSc.

Date of last modification:

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ eMTSb/21	**Course name:** Mathematics II for science

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: 7

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

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

Provides:

Date of last modification:

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ MTB/13	**Course name:** Mathematics for biologists

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:
In the covered areas of mathematics, skills in solving standard problems related to given topics are required.
Evaluation based on the results of two tests (during the semester): A ... at least 80%, B ... at least 70%, C ... at least 60%, D ... at least 50%, E ... at least 40%, FX ... less than 40% .

Learning outcomes:
Short introduction to mathematics, mathematical problem solving strategies and their applications to solving problems in biology and other sciences. Introduction to the computer algebra system MAPLE.

Brief outline of the course:
- (week 1) Basic terms
- (week 2) Geometry in the plane (vectors, lines in the plane and their representations)
- (week 3) Systems of linear equations (linear equation and inequality, system of linear equations, Gaussian elimination)
- (week 4-6) Functions (monotonicity, local extrema, function composition, inverse function, elementary functions and their properties)
- (week 7) Combinatorics (binomial theorem, combinations and permutations without / with repetition, inclusion-exclusion principle)
- (week 8) Sequences and series (monotonicity and boundedness, recurrent sequence, geometric series)
- (week 9) Limit (limit of a sequence, limit of function, convergence, divergence, methods for computing limits, continuity)
- (week 10-11) Derivatives (sum, product, quotient and chain rule, derivatives of elementary functions, Taylor polynomial, analysis of functions)
- (week 12) Integrals (indefinite integral, integration methods: by substitution, by parts, by partial fractions; definite integral)
- (week 13-14) Ordinary differential equations (first order separable ODE, first order linear ODE)

Recommended literature:
E. Bohl, Mathematik in der Biologie, Springer, Berlin Heidelberg, 2006.

D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006.
D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 790

A	B	C	D	E	FX
12.78	13.29	16.58	20.38	27.72	9.24

Provides: RNDr. Igor Fabrici, Dr. rer. nat., RNDr. Jana Borzová, PhD., Mgr. Daniela Kovalčíková

Date of last modification: 28.10.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/MKV/15	**Course name:** Microbiology and basics of virology

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities: ÚBEV/CYT1/15

Conditions for course completion:
Attendance of practicals (at least 90%), 2 written examinations during semester, final oral examination

Learning outcomes:
Students will obtain a basic informations on viruses, prokaryotic and eukaryotic microorganisms, their cytology, physiology, genetics, ecology, classification, and importance . Information on basic methods for studying microorganisms will be provided.

Brief outline of the course:
Viruses, prokaryotic and eukaryotic microorganisms, their cytology, physiology, genetics, ecology, classification. The importance of microorganisms for humans and environment.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1523

A	B	C	D	E	FX
24.56	13.46	18.19	18.65	20.75	4.4

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor, RNDr. Mariana Kolesárová, PhD., RNDr. Lenka Maliničová, PhD.

Date of last modification: 10.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/MOB1/15	**Course name:** Molecular Biology

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

Number of ECTS credits: 7

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚCHV/BCHU/03

Conditions for course completion:
Oral examination.

Learning outcomes:
To provide the students with knowledge of molecular basis of inheritance and control of gene expression and development.

Brief outline of the course:
Structure and properties of information macromolecules. Molecular mechanisms of DNA replication and repair, transcription and translation. Prokaryotic and eukaryotic genome. Control of gene expression in prokaryotes and eukaryotes. Control of cell cycle.

Recommended literature:
Lodish, H., Baltimore, D., Berk, A. et al.: Molecular Cell Biology. Sci. Amer. Books Inc., W.H. Freeman and Company, New York, 1995
Myers, R.A.: Molecular Biology and Biotechnology. VCH Publishers Inc., New York, 1995

Course language:

Notes:

Course assessment
Total number of assessed students: 264

A	B	C	D	E	FX
30.3	17.05	16.67	18.94	14.39	2.65

Provides: doc. RNDr. Peter Pristaš, CSc., univerzitný profesor, RNDr. Zuzana Jendželovská, PhD., RNDr. Ján Košuth, PhD., RNDr. Jana Vargová, PhD.

Date of last modification: 14.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/MBGj/19	**Course name:** Molekular Biology and Genetics

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚBEV/CYT1/15 and ÚBEV/MOB1/15 and ÚBEV/GE1/10

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 66

A	B	C	D	E	FX
45.45	24.24	15.15	6.06	9.09	0.0

Provides:

Date of last modification: 15.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/OCHB/10	**Course name:** Organic Chemistry

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚCHV/VACH/10

Conditions for course completion:
1.Participation in seminars (also applies to the online form of teaching): justified non-participation of the student in two seminars will be excused by the teacher; longer-term justified non-participation of the student in seminars must be proven by the student's mastery of the subject matter in an alternative form determined by the teacher (e.g. preparation of assignments and others...).
2. Activity at seminars (also applies to the online form of teaching) - theoretical preparation of students is required for all seminars.
3.Short written examinations at seminars (max. 50b). Credit slips in the 7th and 14th week with a total sum of 100b. To pass the E rating, it is necessary to obtain 25.5b from each test.
4. The exam is a form of test. A minimum of 51 points is required to pass the exam. The final grade is calculated as the average of the evaluation of papers in seminars, credit papers and the exam itself. Final Grade: A: 91-100b, B: 81-90b, C: 71-80b, D: 61-70b, E: 51-60b, FX: 0-50b.

Learning outcomes:
After completing the course, the student, based on the study of common and different features of compounds, should be able to assess the properties of a given type of compound from the structure and name the corresponding type of compound based on nomenclature principles. From the acquired knowledge about the structure and properties of the relevant types of hydrocarbon compounds, the student should be able to independently derive the mechanisms of individual reactions.

Brief outline of the course:

Recommended literature:
1. Online ppt presentations in the system MOODLE na moodle science.upjs.sk
2. Organic chemistry, Clayden, Greeves Warren & Wothers, Oxford university Press, 2010.
3. Organická chémia, John McMurry, Vysoké učení technické v Brne, 2007, VUTIUM, ISBN: 978-80-214-3291-8 (VUT v Brne).
4. Organická chémia, Pavol Zahradník, Mária Mečiarová, Peter Magdolen, Univerzita Komenského v Bratislave, 2019, ISBN: 978-80-223-4589-7.

Course language:
anglický

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

Course assessment
Total number of assessed students: 319

A	B	C	D	E	FX
19.44	21.32	32.92	19.44	6.58	0.31

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

Date of last modification: 15.08.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ PAR1/03	**Course name:** Parasitology 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: 6

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:
active participation in practical exercises
presentation of seminar work
continuous written examinations
oral examination

Learning outcomes:
Upon completion of this Parasitology I., students will demonstrate:
-an understanding of the fundamental terms and principles of parasitism
-an ability to outline the general life cycles of the major parasites of medical and veterinary importance
-an understanding of the ecology of parasites, and of the importance of parasites in the ecosystem
-an understanding of the methods of control
-an ability to determine species of human and animal parasites

Brief outline of the course:
The subject classifies epidemiologically and epizootologically important parasites. Basic parasitological concepts are discussed like adaptations, evolution, parasite-host interactions, systematic overview of parasitic animals, their ecology and epidemiology, natural focus and transimissive parasitoses.
Syllabus:
1 week: Fascinating world of parasites
2 week: General parasitology, basic epidemiological terms
3 week: Evolution of parasites
4 week: Forms of transmission
5 week: Unicelluar parasites: Excavata - Trypanosomatida, Diplomonadida
6 week: Unicelluar parasites: Excavata - Trichomonadida; Amebozoa
7 week: Unicelluar parasites: Chromalveolata - Apicomplexa
8 week: Helminths: Trematoda, Monogenea
9 week: Helminths: Cestoda
10 week: Helminths: Nematoda, Acanthocephala
11 week: Arachnoentomology: Crustacea, Pentastomida, Chelicerata

12 week: Arachnoentomology: Insecta
13 week: Arachnoentomology: Insecta - Diptera

Recommended literature:
1. Roberts, Janovy Jr. Nadler,Foundations of Parasitology, 9th edition, 2012 McGraw-Hill Education, 701pp.
2. Loker, Parasitology: A Conceptual Approach, 2015, Garland Science, 560 pp.

Course language:
slavak, english

Notes:

Course assessment
Total number of assessed students: 511

A	B	C	D	E	FX	N	P
53.23	19.77	11.94	10.37	2.94	0.59	0.0	1.17

Provides: RNDr. Viktória Majláthová, PhD., univerzitná docentka

Date of last modification: 17.09.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ FCH1/02	**Course name:** Physical Chemistry for Biological Sciences

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:
Test
Exam
During an exam, a student should demonstrate his/her ability to solve theoretical exercises from the selected parts of the Physical chemistry for biological sciences. Morever, the students should be able to manifest theoretical knowledge from the chapters which are present in the brief outline of the course.

Learning outcomes:
The introduction into the fundamental knowledge of selected parts of physical chemistry with emphasis on the utilization of these knowledge for the study of physico-chemical properties of biomacromolecules and biological systems. After completing the course, the students should understand physico-chemical mechanisms of many biological processes.

Brief outline of the course:
Week 1
Physical chemistry - areas of research, importance for science, definition. Thermodynamics - definition, areas of interest. Thermodynamic system. Properties of thermodynamic system. Basic thermodynamic quantities (pressure, volume, temperature, internal energy). Zero law of thermodynamics. Ideal gas. Equation of state of an ideal gas. Gas mixtures - Dalton's law. Real gas. Van der Waals equation of state.
Week 2
1st law of thermodynamics. Internal energy, work, heat. Mathematical formulation of the 1st law of thermodynamics. Enthalpy. Heat capacity. Relationship between heat capacities at constant pressure and volume. Isothermal expansion of an ideal gas. Work in reversible and irreversible isothermal expansion. Adiabatic expansion of an ideal gas. Exothermic and endothermic reactions and processes. Standard state of substances. Hess's law.
Week 3
Examples of spontaneous processes in nature. Definitions of the 2nd law of thermodynamics (Kelvin, Celsius). Entropy - introduction of the term. Thermodynamic definition of entropy. Entropy as a state function. Carnot cycle. Efficiency of a heat engine. Claussius inequality. Entropy

of isothermal expansion, gas mixing, melting and evaporation processes. Dependence of entropy on temperature. Nernst's heat theorem. 3rd law of thermodynamics.
Week 4
Entropy as a property determining the spontaneity of processes. Criteria of process spontaneity at constant volume and constant pressure. Helmoltz and Gibbs free energy. Properties of Helmoltz energy. Properties of Gibbs energy. Standard Gibbs energy of a chemical reaction. Dependence of Gibbs energy on temperature - Gibbs-Helmoltz equation. Dependence of Gibbs energy on pressure for solids, liquids and gases. Simple mixtures. Partial molar volume. Partial molar Gibbs energy, chemical potential.
Week 5
Chemical potential in a liquid. Raoult's law, the ideal solution. Henry's law, ideally diluted solution. Mixing solutions, ideal solutions. Residual functions and regular solutions. Colligative properties. Increasing the boiling point and decreasing the melting point of the liquid in which the soluble chemical compound is located. Osmosis. Solvent activity, soluble substance activity.
Week 6
Chemical equilibrium. Gibbs energy of a chemical reaction. Chemical equilibrium in an ideal gas. Equilibrium constant of chemical reaction. Temperature dependence of the equilibrium constant - van‘t Hoff's equation. Stability of protein structure. Thermal denaturation of proteins. Van’t Hoff enthalpy of protein denaturation. Chemical denaturation of proteins. Physiological consequences of incorrectly folded proteins.
Week 7
Examples of molecular associations and their significance for biological systems. Dissociation and association binding constants. Determination of dissociation binding constant - Langmuir isotherm. Cooperativity in ligand-macromolecule interactions. Cooperativity - simultaneous ligand binding, Hill's equation. Cooperativity - gradual binding of ligands. Allosteric interactions. Qualitative description of the Monod - Wyman - Changeaux model for cooperative binding of ligands to macromolecules. Experimental methods used to study the ligand - macromolecule interactions.
Week 8 Chemical and biochemical kinetics - basic definitions. Rates of chemical reactions. Rate constant. Order of chemical reaction. First order reactions. Second order reactions. Consecutive reactions. Determination of the rate law. Reverse chemical reactions. Relaxation processes. Temperature dependence of rate constants - Arrhenius equation. Experimental techniques used to determine the rates of chemical reactions. Transition state theory - Eyring's theory.
Week 9
Enzymes - characterization and classification. Equilibrium model of enzyme kinetics. Steady state model of enzyme kinetics. Experimental determination of maximum rate and Michaelis-Menten constant in enzymatic reactions. Deviations from Michaelis-Menten kinetics. Enzyme inhibition. Reversible inhibition. Competitive, non-competitive and uncompetitive inhibition.
Week 10
Kinetics of photophysical and photochemical processes. Jablonski diagram. Fluorescence, phosphorescence. Quantum yields of photophysical processes. Quenching of the excited states of molecules by external factors. Fluorescence quenching. Stern-Volmer equation. Förster resonance energy transfer (FRET). Biological application of FRET.
Week 11
Electrochemical reactions. Electrochemical cell. Standard redox potentials. Relationship between Gibbs energy change and electrochemical potential. Temperature dependence of electrochemical potential. Use of electrochemical cells. Determination of redox potential. Ionic electrochemical gradient. Proton motive force. Nernst potential. Introduction to the respiratory chain in mitochondria.
Week 12

Acids and bases. Acid-base properties of water. pH - measurement of environmental acidity. Dissociation of acids and bases - acid-base equilibrium. Henderson - Hasselbalch equation. Buffers.

Recommended literature:

1. P. Atkins and J. de Paula. Atkins's Physical Chemistry (9th Edition), Oxford University Press, 2010.
2. P. Atkins. Fyzikálna chémia (slovenský preklad 6. vydania), STU Bratislava, 1999.
3. P. Atkins, J. De Paula. Fyzikální chemie (český preklad 9. vydania), VŠCHT Praha, 2013
4. R.Chang. Physical Chemistry for the Biosciences, University Science Book, 2006.
5. D. Eisenberg and D. Crothers. Physical Chemistry with Applications to the Life Sciences, Benjamin/Cummings, 1979.
6. K. van Holde, W. Johnson and P. Ho. Principles of Physical Biochemistry, Prentice Hall, 1988.
7. D.T. Haynie. Biological Thermodynamics (2nd Edition), Cambridge University Press, 2008.
8. A.P.H. Peters. Concise Chemical Thermodynamics (3rd Edition), CRC Press, Taylor & Francis Group, 2010.
9. I. Tinoco, jr., K. Sauer, J.C. Wang, J.C. Puglisi, G. Harbison and D.Rovnyak. Physical Chemistry – Principles and Applications in Biological Sciences (5th Edition), Pearson, 2014.
10. A. Cooksy. Physical Chemistry- Thermodynamics, Statistical Mechanics, and Kinetics, Pearson, 2014.

Course language:
English language

Notes:

Course assessment
Total number of assessed students: 123

A	B	C	D	E	FX
17.89	27.64	34.15	11.38	8.94	0.0

Provides: prof. Mgr. Daniel Jancura, PhD., RNDr. Veronika Huntošová, PhD.

Date of last modification: 17.09.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/FPB/13	**Course name:** Physics for Biologists

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: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 908

A	B	C	D	E	FX
14.65	17.07	26.65	22.69	17.62	1.32

Provides: RNDr. Gabriela Fabriciová, PhD.

Date of last modification: 25.11.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ FG1/03	**Course name:** Phytogeography

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: 3., 5.

Course level: I., II.

Prerequisities:

Conditions for course completion:
1. Lectures are optional, but highly recommended due to the presentation of otherwise difficult-to-access information and its synthesis.
2. In addition to the exam, the student must complete a mandatory 5-hour field trip focusing on the aspects that determine the spread of plants on Earth, solve practical tasks from the topic of the subject and prepare a semester presentation on the given topic, the presentation is defended at a scientific mini-conference.

Learning outcomes:
After completing the subject, the student is oriented in various aspects of phytogeographic issues and can apply the acquired knowledge both in basic research within chorology, historical and regional phytogeography, as well as in the evaluation of world biomes. The practical application of the subject is within the study of geographically and climatically conditioned changes in vegetation, in the assessment of the reduction of biodiversity and the extinction of the natural plant communities of the Earth, and the acquired knowledge can be used in work in environmental protection.

Brief outline of the course:
1. History of the subject. Plants and environment. Dynamics of the earth's surface.
2. Abiotic and biotic factors of the plant environment.
3. Chorology, range, areal disjunctions, relics, endemism, vicarism.
4. Elements of flora - older and newer approaches.
5. Main features of florogenesis. Paleozoic, Mesozoic, Cenozoic.
6. Main features of florogenesis. Cenozoic - Pleistocene, Holocene.
7. Basics of GIS (geographic information systems) and their use in botanical research.
8. Postglacial development of vegetation in Slovakia.
9. Current changes in terrestrial vegetation and their study, plant invasions.
10. Geography of vegetation: from tropical rainforests to tundra I.
11. Geography of vegetation: from tropical rainforests to tundra II.
12. Geographical origin of cultivated plants.
Seminars and exercises consist of a 5-hour excursion focusing on the connections and conditionality of plant distribution and indoor exercises focusing on an overview of phytogeographical literature, atlases of plant distribution and their importance, types of mapping, types of areas, practical

assessment of floristic elements and types of disjunctions , work with maps of specific taxa throughout Europe. Further: regional phytogeography of the Earth, historical overview of opinions on the phytogeographical (floristic) division of Slovakia. Plant phylogeography. Student presentations of final semester theses (phytogeographical mini-conference).

Recommended literature:

Hendrych R.: Fytogeografie. - SPN, Praha 1984.
Prach K., Štech M., Říha P.: Ekologie a rozšíření biomů na Zemi. - Scientia, Praha 2009.
Krippel E.: Postglaciálny vývoj vegetácie Slovenska. – Veda, vyd. SAV, Bratislava, 1986.
Dahl, E.: The Phytogeography of Northern Europe, - Cambridge University Press, 2007.
Brown J. H., Lomolino M. V.: Biogeography. - Sinauer Associates, Sunderland, 1998.
Myers A. A., Giller P. S.: Analytical Biogeography. - Chapman & Hall, 1990.
Various literature devoted to the geography of vegetation (mainly nature and travel), articles in National Geographic, Živa, Vesmír and other magazines.

Course language:

Notes:

Course assessment

Total number of assessed students: 404

A	B	C	D	E	FX
38.61	22.03	21.53	8.66	8.42	0.74

Provides: prof. RNDr. Pavol Mártonfi, PhD., Mgr. Vladislav Kolarčik, PhD., univerzitný docent

Date of last modification: 24.07.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/BRj/19	**Course name:** Plant Biology

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚBEV/CYT1/15 and ÚBEV/VB1/01 and ÚBEV/FR1/10 and ÚBEV/BO1/03 and ÚBEV/BOT1/03

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11

A	B	C	D	E	FX
45.45	18.18	18.18	18.18	0.0	0.0

Provides:

Date of last modification: 20.02.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ BTR1/06	**Course name:** Plant Biotechnology

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 5.

Course level: I., II., III.

Prerequisities:

Conditions for course completion:
Active participation at the practicals, protocols, oral examination

Learning outcomes:
To gain theoretical and practical knowledge on plant tissue culture in vitro.

Brief outline of the course:
Definition and history of plant biotechnology. Aseptic techniques, culture conditions. Micropropagation, types of plant explant cultures used in biotechnology. Somatic hybridization and embryogenesis, direct and indirect organogenesis. Somaclonal varation. Secondary metabolites production, bioreactors, biotransformation, immobilization and elicitation. Genetic transformation, direct and indirect methods of transformation. Types of vectors, promotors, selection markers and reporter genes used in plant transformation. Germplasm storage, gene banks. Cryopreservation and slow growth method. Genetically modified organisms - metabolic engineering, genetic engineering, plants resistant to biotic and abiotic stresses, molecular farming, the role of tissue and organ specific plant promoters, plastome engineering, plant-based edible vaccines. RNA silencing, the application of microRNAs in plant biotechnology.

Recommended literature:
Abdin M.Z., Kiran U., Kamaluddin M., Ali A. (eds.): Plant Biotechnology: Principles and Applications. 2017, Springer Nature Singapore Pte Ltd., Singapore
Chawla H.S.: Introduction to Plant Biotechnology. 2009, third edition, Science Publisher, Enfield, USA
Periodicals and Internet sources

Course language:

Notes:

Course assessment
Total number of assessed students: 190

A	B	C	D	E	FX	N	P
40.0	17.89	13.16	10.53	11.05	2.63	0.0	4.74

Provides: RNDr. Miroslava Bálintová, PhD., RNDr. Jana Henzelyová, PhD.
Date of last modification: 02.02.2021
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ FR1/10	**Course name:** Plant Physiology

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚBEV/VB1/01

Conditions for course completion:
1. Active participation in laboratory practicals. In case of justified non-participation, the teacher will determine an alternative form of lessons.
2. Before the practicals, the students will study the main points of the task that will be carried out. Students will receive an exact list of tasks according to individual lessons at the beginning of the semester.
3. Students make a written report of the practicals. The students will evaluate the results of the tasks and form a conclusion. The protocols are handed over to the teacher before the next lessons at the latest. The teacher checks the protocols and, in case of errors, returns the protocols for revision. If the submitted protocol is correct, the task is considered validly completed.
4. Practicals are considered to have been completed when at least 10 practical tasks are validly completed. Completion of practicals by the end of the semester at the latest (the date will be specified by the teacher) and succesfull test result (6 of 10 points) is obligatory for participation in the exam.
5. The activity in the practicals is evaluated by means of an ongoing point evaluation. A student can get 1-3 points. Obtaining 2 points is considered a standard completion of practicals. The best students can get 3 points for high-quality performance in the laboratory or excelent protocols. On the other hand, 1 point will be awarded to students who completed the practicals despite the teacher's minor reservations.
6. The examination of the subject takes place orally. Students need to answer to three questions and have a max. 30 minutes to prepare them.
Any changes or modifications to the conditions for completing the subject due to the COVID19 pandemic or other serious reasons are continuously posted on the subject's electronic board.

Learning outcomes:
Getting a basic overview of life processes in plants. Acquisition of basic laboratory practice in biochemical methods and work with plant material. Ability to evaluate results and form the conclusions.

Brief outline of the course:
1. Water in plant life, properties of water, water regime; uptake and transport of water, transpiration.

2. Mineral substances in plants, transport mechanisms of mineral substances, Essential elements and their main functions, useful substances and toxic substances.
3. Photosynthesis: Meaning of photosynthesis, photosynthetic pigments, electron and proton transport, ATP production.
4. Metabolic phase of photosynthesis, CO2 fixation, Calvin cycle, Photorespiration, C4 and CAM plants, ecophysiology of photosynthesis.
5. Mobilization of storage substances, Glycolysis, Pentose cycle, Citrate (Krebs) cycle, Mitochondrial respiration, Biosynthesis and mobilization of lipids
6. Nitrogen and sulfur metabolism: Nitrogen uptake and reduction, assimilation of nitrogen, nitrogenase, assimilation of sulfur
7. Secondary plant metabolism: Isoprenoids, phenolic substances, substances derived from amino acids, stress metabolites
8. Plant growth, cell division, cellulose formation, embryogenesis, meristems, regeneration
9. Photoreceptors: Phytochromes, physiological effects of phytochromes, blue light receptors
10. Plant hormones: Characteristics and method of signaling, auxins, gibberellins, cytokinins, abscisic acid, ethylene, brassinosteroids and other hormones
11. Plant movements, tropisms, circadian rhythms
12. Flowering control: Internal and external regulation of flowering, floral meristem and control of flower development.
13. Physiology of stress: Abiotic stress, biotic stress, response of plants to stress.

Recommended literature:
Bhatla S.C., Lal M.A. Plant Physiology, development and metabolism. Springer Nature Singapore Pte Ltd. 2018

Course language:

Notes:

Course assessment
Total number of assessed students: 2015

A	B	C	D	E	FX
16.48	13.5	17.12	14.59	22.03	16.28

Provides: doc. RNDr. Peter Paľove-Balang, PhD.

Date of last modification: 04.02.2025

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ IOR/09	**Course name:** Plant Protection

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: 6.

Course level: I., II.

Prerequisities: ÚBEV/VEK1/03

Conditions for course completion:
1. Attending lectures is voluntary, participation in exercises is mandatory.
2. During the exercises, it is necessary to master the principles of collecting, labeling, storage, processing and identification of plant samples, their potential pests and other accompanying organisms visible at least with a binocular magnifying glass. The data obtained in the field and in the laboratory will be further statistically processed. Specific application procedures in plant protection will be tested according to current possibilities in the area of the P.J. Šafárik University Botanical Garden.
3. Separate processing of a model example regarding effective temperatures and their significance for the development of plant pests and pathogens.
4. Elaboration of an overview of the most significant harmful agents and measures against them when prioritizing biological methods in the protection of the specified type of cultivated plant.

Learning outcomes:
Providing basic information about agents damaging plants and information on plant protection. To a greater extent, paying attention to biological and other more acceptable methods of regulating unwanted organisms in various areas of plant cultivation. Learning practical procedures and principles in applying these gentler methods on model examples. This should make it possible to apply and develop this knowledge in other areas of the management of natural and close to nature systems, where the regulation of undesirable and, conversely, the support of desired types of organisms is expected.

Brief outline of the course:
1. Integrated plant protection (IOR), basic concepts, history of plant protection.
2. Symptoms of plant damage, harmful agents - basic division.
3. Selected viral, bacterial and fungal plant diseases.
4. Selected phytophagous animals.
5. Procedures in plant protection - basic division.
6. Chemical plant protection.
7. Biological protection of plants.
8. Integrated protection of plants in greenhouses.
9. Integrated plant protection in agriculture (external areas).

10. Integrated plant protection in forestry.
11. Invasive species of plants and animals and the possibilities of solving problems associated with them based on the principles of integrated plant protection.
12. Models, perspectives of integrated plant protection.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 74

A	B	C	D	E	FX
5.41	24.32	20.27	20.27	29.73	0.0

Provides: Ing. Martin Suvák, PhD.

Date of last modification: 11.07.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: I., II., P

Prerequisities:

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

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

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

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

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

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 15781

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.74	0.06	0.0	0.0	0.0	0.04	9.0	5.15

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

Date of last modification: 07.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II., P

Prerequisities:

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

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

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

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

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

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 13802

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
83.85	0.49	0.01	0.0	0.0	0.04	11.17	4.43

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

Date of last modification: 07.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 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: 9334

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
87.96	0.06	0.01	0.0	0.0	0.02	4.92	7.03

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

Date of last modification: 07.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 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: 5846

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
82.54	0.27	0.03	0.0	0.0	0.0	8.24	8.91

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

Date of last modification: 07.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ SVK/01	**Course name:** Student Scientific 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: 4	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 31

abs	n
100.0	0.0

Provides:
Date of last modification: 30.11.2021
Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DGS/21	**Course name:** Students` Digital Literacy

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.

Prerequisities:

Conditions for course completion:
Summary evaluation based on ongoing assessment:
1. Practical ongoing assignments and their defense (at least 50% needed)
3. Active participation during face-to-face contact learning in classical or virtual classroom (3 absences allowed) and during online learning (no absence, uploading all individual ongoing assignments)

Learning outcomes:
The student should obtain and know to apply basic knowledge and skills in working with current digital technologies (mobile phone, tablet, laptop, web technologies):
1. according to the current European framework for the Digital competence DigComp and ECDL
2. for better and more effective learning, work and active life in higher education, later lifelong learning and further career prospects.

Brief outline of the course:
01.-02. Basic digital skills, DigComp framework, ECDL
- modern web browser and its personalization
- security, privacy, responsible use of DT
03.-05. Search, collection and evaluation of digital content
- scanning, audio recording and speech resolution, optical resolution (OCR)
- digital notebooks (Google keep, Evernote, Onenote)
- evaluation of digital resources (Google forms and sections)
06.-08. Editing and creating digital content
- cloud and interactive documents
(text and spreadsheet editors - Google, Microsoft, Jupyter)
- work with pdf documents, e-books and videos
(Kami, Google books, Screencasting)
09. - 10. Organization, protection and sharing of digital content
- modern LMS and cloud storage
(Google Classroom, Microsoft team, Google Drive, Dropbox)
- time management (Google Calendar)
11.-13. Digital communication and cooperation

- collaborative interactive whiteboards (Jamboard, Whiteboard)
- online presentations and online meetings
(Google presentations, Powerpoint, Google meet, Microsoft teams)

Recommended literature:

1. Carretero Gomez, S., Vuorikari, R. and Punie, Y., DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, Luxembourg, 2017, ISBN 978-92-79-68006-9, https://www.ecdl.sk/
2. Bruff, D. (2019). Intentional Tech: Principles to Guide the Use of Educational Technology in College Teaching (1st edition). Morgantown: West Virginia University Press.
3. Baker, Y. (2020). Microsoft Teams for Education. Amazon Digital Services.
4. Miller, H. (2021). Google Classroom + Google Apps: 2021 Edition. Brentford: Orion Edition Limited.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 245

A	B	C	D	E	FX
76.33	5.31	2.86	0.0	14.69	0.82

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 26.01.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II., P

Prerequisities:

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

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

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

11. Capsizing
12. Commands

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

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 232

abs	n
36.64	63.36

Provides: Mgr. Dávid Kaško, PhD.

Date of last modification: 29.03.2022

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II., P

Prerequisities:

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

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

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

Recommended literature:

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

Course language:
Slovak language

Notes:

Course assessment
Total number of assessed students: 461

abs	n
46.2	53.8

Provides: Mgr. Ladislav Kručanica, PhD.

Date of last modification: 16.05.2023

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MSB/10	**Course name:** System Biology Modeling
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: 5.	
Course level: I.	
Prerequisities:	
Conditions for course completion: Solving intermediate motivating challenges given at the lectures. Exam.	
Learning outcomes: To provide an overview of the computational techniques and achievable results in the emerging field of systems biology.	
Brief outline of the course: Basics of molecular modeling. Physical structure of biopolymers. Foldamers, Levinthal paradox and Anfinsen principle. Essentials of molecular modeling and molecular simulations. Examples of procedures and their results. Biological polymers as sequences. Sequence comparision. Biological databases of sequences, acces and work. BLAS, FASTA, scoring matrices. Sugar code as an example of non-linear code. Examples of use and results. Molecular interaction networks, modeling of reaction kinetics. Application of graph-based approaches. Stochastic and deterministic modeling. Typical examples of use. Outlines and perspectives of systems biology and systems medicine. Chalenges of synthetic biology.	
Recommended literature: Alon, Uri. *An Introduction to Systems Biology: Design Principles of Biological Circuits*. 1st ed. Chapman and Hall/CRC, 2006. Campbell, A. Malcolm, and Laurie J. Heyer. *Discovering Genomics, Proteomics and Bioinformatics*. 2nd ed. Benjamin Cummings, 2006. Gabius, Hans-Joachim. *The Sugar Code: Fundamentals of Glycosciences*. Wiley-VCH, 2009.	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 224

A	B	C	D	E	FX
91.52	6.25	1.79	0.45	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 08.09.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ ZOG1/03	**Course name:** Zoogeography

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: 5.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Active participation in seminars.
Preparation of oral presentation to a selected topic.
Completion of two semestral written examinations.
Oral examination.

Learning outcomes:
The main goal of the subject is to get knowledge on the basic reasons of recent distribution of the animals on the Earth, zoogeographic regionalization of the Earth´s surface and human influence on the faunal distribution in the history.

Brief outline of the course:
This course will review our current understanding of the patterns of animal distribution and the processes that influence distributions of species and their attributes. Zoogeography will integrate information on the historical and current ecology, genetics, and physiology of animals and their interaction with environmental processes (continental drift, climate) in regulating geographic distributions. The course will emphasize descriptive and analytical approaches useful in hypothesis testing in zoogeography and will illustrate applied aspects of zoogeography (e.g. refuge design in conservation).

Recommended literature:
Buchar, J., 1983: Zoogeografie. SPN Praha
Darlington, P.J., 1998: Zoogeography: The geographical distribution of animals. Krieger, USA
Lomolino M.V., Brown J.H., Riddle B. R., 2005: Biogeography. Sinauer Associates, 1-845
Plesník, P., Zatkalík, F., 1996: Biogeografia. Vysokoškolské skriptá, PríFUK Bratislava

Course language:

Notes:

Course assessment
Total number of assessed students: 1033

A	B	C	D	E	FX
25.56	23.14	23.43	18.49	7.74	1.65

Provides: prof. RNDr. Ľubomír Kováč, CSc., RNDr. Natália Raschmanová, PhD., univerzitná docentka

Date of last modification: 10.12.2021

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚBEV/ ZO1/03	**Course name:** Zoology 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: 5

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities: ÚBEV/PMZ/10

Conditions for course completion:
The condition for passing the subject is active participation in mandatory exercises, completion of all interim assessments during the exercises and successful completion of the final exam.
After successfully completing the exercises, students proceed to the final exam, bringing with them points from the exercises that make up 40% of the final grade. Students receive 60% of the final grade from the final oral exam.
Continuous evaluations during the exercises are: a test on zoological terms (knowing how to define selected terms; the list is published at the beginning of the semester), recognizing animals according to the picture (assign the Slovak and scientific genus and species name to the depicted animal and classify it into a class or series; the list of animals is published at the beginning of the semester, the students' task is to find the correct animal pictures for the names and learn to name the animal according to the picture). Students have one correction period for the paper and animal knowledge. All interim assessments are scored. The maximum number of points from the exercises is 40, while the student must obtain at least 28 points to pass the exercises.
If students get less than 28 points from the interim evaluations in the exercises, they have not completed the exercises and must enroll in the subject again in the next academic year. If the students get at least 28 points, they have successfully completed the exercises and can register for the final exam, bringing with them the points from the exercises, which make up 40% of the final grade.
The exam is always oral. Specific exam dates will be posted in AIS2 at the end of the semester. More detailed information on the types of questions on the exam is published in the Moodle course for the subject. Students get 60% of the final grade from the exam.
Point limits for individual grades:
A - 100.0-93.0 points
B - 92.9-86.0 points
C - 85.9-79.0 points
D - 78.9-72.0 points
E - 71.9-65.0 points
FX - less than 65 points

Learning outcomes:

Students will gain knowledge of the systematic classification and phylogenetic relationships of the higher groups of non-chordates, knowledge of their morphology, anatomy, mode of reproduction, biology and geographic distribution.

Brief outline of the course:

1. Fundamentals of the history of zoology.

System, anatomy, morphology, development, phylogenetic relationships and exemplary species of selected groups of invertebrates:

2. Porifera, Cnidaria, Ctenophora
3. Platyhelminthes, Rotifera, Acantocephala
4. Entoprocta, Ectoprocta, Cycliophora
5. Mollusca, Annelida
6. Nematode, Onychophora, Tardigrad
7. Arthropoda - Chelicerata
8. Arthropoda - Myriapoda
9. Arthropoda - Crustacea (Branchiata)
10. Arthropoda - Hexapoda / Entogantha
11. Arthropoda - Hexapoda / Insecta Heterometabola
12. Arthropoda - Hexapoda / Insecta Holometabola
13. Deusterostomia - Echinodermata

Recommended literature:

Course language:

Notes:

If necessary, students have the opportunity to consult with the lecturer. Unless otherwise stated at the first lecture, consultations take place every Wednesday between 10:00 and 11:00. If the date is not convenient for someone, it is advisable to arrange a consultation date individually by contacting the lecturer by email (peter.luptacik@upjs.sk).

Course assessment

Total number of assessed students: 1355

A	B	C	D	E	FX
8.71	16.53	22.29	21.85	22.73	7.9

Provides: RNDr. Peter Ľuptáčik, PhD., RNDr. Andrea Rendošová, PhD.

Date of last modification: 21.02.2024

Approved: doc. RNDr. Andrej Mock, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ZOO1/03	**Course name:** Zoology 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: 5

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚBEV/PMZ/10

Conditions for course completion:

Learning outcomes:
Fundamental information on taxonomy and morphology of vertebrates

Brief outline of the course:
Systematic and phylogenetic relationships of vertebrate. Review of important groups of fishes, amphibians, reptiles, bidrs and mammals.
1. Introduction
2. Chordata, Protochordata
3. Verrtebrata introduction
4. Agnatha
5. Chondrichthyes
6. Osteognathostomata
7. Actinopterygii
8. Sarcopterygii
9. Tetrapoda
10. Lissamphibia
11. Reptilia
12. Aves
13. Mammalia

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1169

A	B	C	D	E	FX
21.98	29.0	18.91	14.97	9.32	5.82

Provides: doc. RNDr. Marcel Uhrin, PhD., univerzitný profesor, RNDr. Monika Balogová, PhD.

Date of last modification: 20.09.2021
Approved: doc. RNDr. Andrej Mock, PhD.