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## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KF/AFS/05		<b>Course name:</b> Ancient Philosophy and Present Times			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> When implementing the subject in the classical - face-to-face - form of teaching: 40% - continuous assessment of student activity at seminars, partial seminar work - assignment. 60% - final test, or seminar paper in the range of 10 A4 standard pages (with compliance with the KF citation standard for seminar and qualification papers. In the case of a transition to distance education, students will be assigned sub-tasks for studying philosophical texts and processing the task in written form, which must be submitted by the set deadline, will be assigned points (partial assessment) and at the end will prepare a seminar paper to the same extent as in the face-to-face form teaching.					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Point out the roots of Western civilization that go back to the Greeks. The ancient Greeks, as one of the 3 pillars of European culture, reveal the origins of democracy and critical thinking. Emphasizing the interconnectedness of ancient philosophy and EPISTEME will enable a better understanding of the issues of thought formation, the relationship between philosophy and science, and modern society, where the emergence of mathematical natural science in the 17th century is the pillar on which Europe and European humanity stand. The student will be able to understand the questions and problems of today if he discovers the foundations and contexts leading to serious questions of today's form of society, thinking, science and culture.					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 31					
A	B	C	D	E	FX
80.65	6.45	6.45	0.0	6.45	0.0
<b>Provides:</b> doc. PhDr. Peter Nezník, CSc.					

<b>Date of last modification:</b> 24.08.2022
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ EFZ1/03	<b>Course name:</b> Animal and Human Ecophysiology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Elaboration of semestral thesis.	
<b>Learning outcomes:</b> To understand the basic mechanisms of adaptations to environmental factors in animals and humans.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Definition of the subject. External environment characteristics. Environmental factors, classification, time factor. Reaction, adaptation, deformation. Classification of adaptations. Stress reaction, general adaptation syndrome.</li> <li>2. Pathological reaction, pathological state, disease. General characteristics of disease – pain, fever, inflammation.</li> <li>3. Ageing, theories, physiological changes in ageing. Death of organism. Adaptations to food intake changes and food composition. Food intake regulation.</li> <li>4. Caloric restriction, starving, increased caloric intake, obesity. Time factor in food intake.</li> <li>5. Thermoregulation, heat and cold adaptations. Hibernation, diapause.</li> <li>6. Altitude and hyperbaric adaptations. Osmoregulation.</li> <li>7. The effects of hypergravity and microgravity, physiological changes during space flight. Sound, ultrasound, infrasound effects.</li> <li>8. Electromagnetic fields. Effects of electric current. Infrared, visible, ultraviolet radiation and their significance for organisms. Microwaves. Laser.</li> <li>9. Ionising radiation, classification, sources. The effects of ionising radiation.</li> <li>10. Xenobiotics, biotransformation. Air, water, and soil pollutants.</li> <li>11. Drug abuse, mechanism of drug action. The effects of opioids and CNS depressants – sedatives, hypnotics, and alcohol.</li> <li>12. The effects of CNS stimulants – amphetamines, cocaine, methylxanthines, nicotine. The effects of hallucinogens and solvents.</li> <li>13. Carcinogenesis, chemical, physical, and biological carcinogens. Oncogenes, tumour suppressor genes. Prevention of carcinogenesis. Prions.</li> </ol>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. Piantadosi C.A. Biology of Human Survival: Life and Death in Extreme Environments. Oxford Press 2003.</li> </ol>	

2. Wilmer P and co.: Environmental Physiology of Animals. Blackwell Publishing Inc., 2004
3. Chown SL, Nicolson SW: Insect Physiological Ecology. Oxford University Press 2004

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 434

A	B	C	D	E	FX
14.29	22.58	22.81	22.81	16.36	1.15

**Provides:** doc. RNDr. Bianka Bojková, PhD.

**Date of last modification:** 14.07.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚBEV/ AMK/15		<b>Course name:</b> Applied Microbiology					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present							
<b>Number of ECTS credits:</b> 5							
<b>Recommended semester/trimester of the course:</b>							
<b>Course level:</b> II., III.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Attendance of practicals (at least 90%), final examination							
<b>Learning outcomes:</b> The students will acquire in-depth knowledge on the important role of microorganisms in different fields like food (production of beer, wine, milk products, probiotics), chemical and pharmaceutical industry (production of vitamins, hormones, amino acids, enzymes, commodity chemicals), vaccines and their production, wastewater treatment, as well as microbial bioremediation, biofuels and biomining.							
<b>Brief outline of the course:</b> Application of bacteria in industrial processes, biochemicals production. Application of recombinant DNA techniques in industry. Lactic acid bacteria and its application in food industry. Microbiology in food quality control. Application of microorganisms in environment protection – wastewater treatment, bioremediation, biofuels, microbiology of biogas plants.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 41							
A	B	C	D	E	FX	N	P
53.66	19.51	12.2	4.88	0.0	0.0	0.0	9.76
<b>Provides:</b> doc. RNDr. Peter Pristaš, CSc., RNDr. Lenka Maliničová, PhD., RNDr. Jana Kisková, PhD.							
<b>Date of last modification:</b> 23.06.2022							
<b>Approved:</b>							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ MMZ/20	<b>Course name:</b> Basic molecular methods in Zoology and Animal Physiology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 2 <b>Per study period:</b> 14 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Ongoing evaluation: active participation on practical exercises Final evaluation: fulfilling the practical task	
<b>Learning outcomes:</b> Practical skills in the following techniques: <ul style="list-style-type: none"> <li>- Pipetting methods,</li> <li>- DNA/RNA extraction,</li> <li>- PCR methods (PCR, RT-PCR, qRT-PCR) + electrophoretic visualization</li> <li>- database NCBI (GenBank, BOLD)</li> <li>- basic instructions in using of phylogenetic program Mega: sequences trimming, construction of phylogenetic trees</li> </ul>	
<b>Brief outline of the course:</b> The aim of the subject is to introduce the methods of molecular biology as the tools used to solve problems of zoological, ecological and physiological studies, in both theoretical but first of all in practical form. The course focuses on basic molecular methods used in studies of taxonomy, ecology and physiology of animals (invertebrates and vertebrates). The main task is to provide not only theoretical knowledge, but in the form of practical exercises, mainly skills usable in practice (especially in the solution of future bachelor and master theses).	
<b>Recommended literature:</b> Šmarda a kol. 2005. Metody molekulární biologie. Masarykova univerzita, Brno. Weaver, R.F. 2002. Molecular biology. University of Kansas Pastoráková A. & Petrovič, R. 2016. Molekulárne metódy aktuálne používané v klinickej genetike. Univerzita Komenského v Bratislave, Lekárska fakulta	
<b>Course language:</b> Slovak or English language	
<b>Notes:</b>	



<b>Course assessment</b>					
Total number of assessed students: 18					
A	B	C	D	E	FX
22.22	38.89	16.67	22.22	0.0	0.0
<b>Provides:</b> RNDr. Andrea Parimuchová, PhD., RNDr. Terézia Kisková, PhD.					
<b>Date of last modification:</b> 14.05.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ BIONF/16	<b>Course name:</b> Bioinformatics
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> attendance at lectures and practicals (at least 80%), continuous evaluation of the performance of tasks, final examination	
<b>Learning outcomes:</b> The students will acquire basic knowledge of biological databases, acquisition and analysis of sequencing data, biological approaches in phylogenetic analysis, construction and interpretation of phylogenetic trees and methods for molecular identification of organisms	
<b>Brief outline of the course:</b> Introduction to Bioinformatics, free accessible biological and biomedical databases, free available bioinformatics tools. Analysis of biopolymers - nucleic acids and proteins. Pairwise sequence comparisons, multiple sequence comparisons, analysis of evolutionary and phylogenetic relatedness of biopolymers, creation and analysis of phylogenetic trees, molecular identification of organisms.	
<b>Recommended literature:</b> Cvrčková F. Úvod do praktické bioinformatiky. Česko: Academia, 2006. 148 s. ISBN 80-200-1360-1. Brown, T. A. Genomes 3. 3rd ed. New York : Garland Science Publishing. 2007. 713 p. ISBN 0-8153-4138-5 Nei M, Kumar S. Molecular Evolution and Phylogenetics. Oxford University Press. 2000. 333 p. ISBN 978-0195135855 Lemey P, Salemi M, Vandamme A-M. The Phylogenetic Handbook: A Practical Approach to Phylogenetic Analysis and Hypothesis Testing / Edition 2. Cambridge University Press. 2009. 750 p. ISBN 978-0521730716 Manuals for used software and online tools	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 55					
A	B	C	D	E	FX
96.36	3.64	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Jana Kisková, PhD.					
<b>Date of last modification:</b> 01.08.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ BRS1/03	<b>Course name:</b> Biology of Plant Symbioses
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II., III.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. presentation of a semester project on a selected topic 2. proving knowledge of the subject by oral exam	
<b>Learning outcomes:</b> After completing the subject, the student will get knowledge and understanding of what symbiosis is, what is its role and meaning, with a focus on interactions in the plant kingdom. The student should be able to apply the acquired knowledge in practice, such as when growing crops or in gardening. He should also be able to use the knowledge gained by completing this subject when conducting experiments related to symbioses.	
<b>Brief outline of the course:</b> 1. Introduction to the study of symbioses 2. Viruses and their symbiosis with fungi, algae and plants 3. Bacterial associations with plants 4. Fungal associations with fungi, algae and plants 5. Associations of algae with protozoa and invertebrates 6. Symbiosis of flowering plants 7. Symbiosis of coral reefs 8. Endosymbiosis 9. Morphological, cytological, physiological and biochemical aspects of the most famous examples plant symbioses. 10. signals and communication in plant symbiosis (signaling of cyanobacteria with plants) 11. Signals and communication in plant symbiosis (signaling of ectomycorrhizal symbioses) 12. Ecological use of plant symbioses in practice 13. presentation of the semester project	
<b>Recommended literature:</b> Van den Hoek, C. et al. 1995: Algae, an introduction to phycology, Deacon, J.W. 1997: Modern Mycology Paracer S., Ahmadjian V., 2000: Symbiosis: an introduction to Biological Associations	
<b>Course language:</b>	

slovak, english							
<b>Notes:</b>							
<b>Course assessment</b>							
Total number of assessed students: 338							
A	B	C	D	E	FX	N	P
95.27	0.0	0.0	0.0	0.0	0.0	0.0	4.73
<b>Provides:</b> prof. RNDr. Martin Bačkor, DrSc.							
<b>Date of last modification:</b> 31.07.2022							
<b>Approved:</b>							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ BFR/14		<b>Course name:</b> Botany and Plant Physiology			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 31					
A	B	C	D	E	FX
38.71	16.13	29.03	6.45	6.45	3.23
<b>Provides:</b>					
<b>Date of last modification:</b> 17.02.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ BMR/20	<b>Course name:</b> Carnivorous plant biology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Attending lectures is optional, participation in exercises is mandatory 2. Handing over the developed protocols from practicals constitutes 20% of the grade 3. The oral exam consists of 1 main question and 4 additional questions.	
<b>Learning outcomes:</b> Students will become familiar with carnivorous plants, current knowledge and trends in the research of these plants. The lecture will cover areas related to physiology, ecology, biogeography, genetics and systematic classification of carnivorous plants. As part of the course, students will practically get to know carnivorous plants cultivation in in vitro conditions.	
<b>Brief outline of the course:</b> 1. Carnivorous syndrome - "definition" 2. Description of trap structures and functions 3. Digestive enzymes of carnivorous plants 4. Presence of microorganisms in carnivorous plants, leaf dimorphism, parasitism 5. Species richness, overview of families, genera and species 6. Ecology and biogeography of carnivorous plants 7. Ecophysiology of aquatic carnivorous plants 8. Carnivorous plants in the Czech Republic and Slovakia 9. Cultivation of carnivorous plants, basic procedures 10. Application of physiological knowledge in cultivation 11. Genetics and breeding 12. Current trends in carnivorous plant research 13. Acquaintance with the carnivorous plants collection in the greenhouses of the Botanical Garden in Košice, demonstration of carnivorous plants cultivation and propagation	
<b>Recommended literature:</b> Aaron Ellison, Lubomír Adamec, 2017: Carnivorous plants: Physiology, Ecology and Evolution, Oxford	
<b>Course language:</b> slovak, english	

<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 9					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Michaela Bačovčinová, PhD.					
<b>Date of last modification:</b> 01.08.2022					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KF/KDF/05		<b>Course name:</b> Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction)			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 10					
A	B	C	D	E	FX
50.0	20.0	10.0	0.0	10.0	10.0
<b>Provides:</b> PhDr. Dušan Hruška, PhD.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ CRO1/03	<b>Course name:</b> Chronophysiology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II., III.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Active participation on practicals. Passing of the final oral examination.	
<b>Learning outcomes:</b> To outline the problematics of the time organization of biological processes and their significance in evolution of living organisms. To understand the mechanisms, ensuring the adaptation to regular changes in their environment with various periodicity, as well as of the common action of external and internal factors in control of the biological rhythms..	
<b>Brief outline of the course:</b> 1. Time structure of the physiological variables in animals. 2. Overview of the history of chronobiology. 3. Basic notions and division of biological rhythms. 4. Genetic basis and molecular mechanisms of the biological rhythms in animals. 5. Endogenous character of the biological rhythms. Localization of the biological clock. 6. Synchronisation of rhythms. Multioscillatory system of the body. 7. Model animals in study of biological rhythms. 8. Ultradian rhythms. 9. Circaannual (seasonal) rhythms. 10. Application of chronobiological principles in medicine. 11. Disturbations of the biological rhythms. The jet-lag syndrome. 12. Biological rhythms in shift-work. 13. The significance of biological rhythms in the evolution of living organisms.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>							
Total number of assessed students: 98							
A	B	C	D	E	FX	N	P
21.43	20.41	27.55	11.22	4.08	0.0	0.0	15.31
<b>Provides:</b> prof. RNDr. Beňadik Šmajda, CSc., RNDr. Natália Pipová, PhD.							
<b>Date of last modification:</b> 21.09.2021							
<b>Approved:</b>							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KPPaPZ/KK/07	<b>Course name:</b> Communication and Cooperation
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Evaluation: A condition for student evaluation is his active participation in the seminar. It is expected that the student will actively participate in the discussions and will express their positions and possible solutions. The output for evaluation will be the development of a project in the form of a Power Point presentation or a video on a selected communication topic.	
<b>Learning outcomes:</b> The goal of the subject Communication, cooperation is the formation and development of students' language and communication skills through experiential activities. The student can demonstrate an understanding of individual behavior in various communication contexts. The student can describe, explain and evaluate communication techniques (cooperation, assertiveness, empathy, negotiation, persuasion) in practical contexts. The student can apply these techniques in common communication schemes.	
<b>Brief outline of the course:</b> Communication Communication theory Non-verbal communication and its means Verbal communication (basic components of communication, language means of communication) about active listening Empathy Short conversation and effective communication (principles and principles of effective communication) Cooperation About the basics of cooperation About types, signs, types and factors of cooperation Characteristics of the team (positions in the team) Small social group (structure, development, characteristics of a small social group, position of the individual in the group)	

About leadership (characteristics of the leader, management, leadership styles)		
<b>Recommended literature:</b>		
<b>Course language:</b>		
<b>Notes:</b>		
<b>Course assessment</b>		
Total number of assessed students: 281		
abs	n	z
98.22	1.78	0.0
<b>Provides:</b> Mgr. Ondrej Kalina, PhD., Mgr. Lucia Barbierik, PhD.		
<b>Date of last modification:</b> 31.07.2022		
<b>Approved:</b>		

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚBEV/CK1/03		<b>Course name:</b> Cytogenetics and Karyology					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 2 <b>Per study period:</b> 14 / 28 <b>Course method:</b> present							
<b>Number of ECTS credits:</b> 4							
<b>Recommended semester/trimester of the course:</b>							
<b>Course level:</b> II., III.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> written tests, oral examination; Practicals: The protocols and worksheets from the practical activities or distance learning are required. The e-learning course UBEV/Cytogenetika a karyológia is available in Moodle.							
<b>Learning outcomes:</b> To gain knowledge and experience on genetic processes at the cell level using the newest scientific findings of cytogenetics. To get acquainted in detail with the results and significance of human genome mapping (HUGO project).							
<b>Brief outline of the course:</b> Organisation of eukaryotic genome. Nuclear skeleton. Nucleolus, nucleolar skeleton. Chromatin structure and changes of chromatin. Levels of DNA organisation in cell nucleus. Chromosomes. Polythene chromosomes. Cell cycle. Genetic regulation of a cell cycle. Genetic regulation of cell differentiation. Apoptosis. Telomeres and function of telomerase. Molecular cytology. Basic characteristics of the Human genom project - what we can learn from it?							
<b>Recommended literature:</b> Snustad, P.D., Simmons, M.J.: Principles of Genetics. John Wiley and Sons, 5th edition 2009, 871 pp. Periodicals Internet sources							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 1582							
A	B	C	D	E	FX	N	P
25.22	14.85	15.74	14.22	18.33	10.75	0.0	0.88
<b>Provides:</b> prof. RNDr. Eva Čellárová, DrSc., doc. RNDr. Katarína Bruňáková, PhD.							
<b>Date of last modification:</b> 26.07.2021							

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ DNR/06	<b>Course name:</b> Dendrology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Attending lectures is optional, participation in exercises is mandatory. 2. During the exercises, it is necessary to master the recognition of selected trees and shrubs in their various phenological phases according to significant identifying features (buds, bark, shape of leaves and flowers, habitus) and some species-specific features (cork wings, thorns, prominent pubescence, distinctive color of shoots in winter, etc.). 3. Within the framework of forest tree seed production, it is necessary to master the identification of fruits and seeds of selected taxa of woody plants.	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b> 1. Summary of basic terms within the subject Dendrology. 2. Individual variability of woody plants (morphological, biochemical, biological, technical forms). 3. Geographic variability of woody plants (climate type, edaphotype). 4. Individual ecological requirements of woody plants with a basic overview of taxa (woody plants in shade and sunny conditions, oceanic and continental climate). 5. Special communities of woody plants, their characteristics and overview of the most important taxa. Pioneer woody plants, melioration woody plants, woody plants in ravines and scree, forest-steppe woody plants, floodplain woody plants, peatland woody plants and woody plants of upper forest border. 6. Saving the gene pool of forest trees (generative and clone seed orchards, selected trees and stands). 7. Selected chapters from the seed production of forest trees (external and internal factors of seed production, methods of collecting and technology of seed processing and its subsequent storage). 8. Selected chapters from forest tree seed production (seed lifespan, short-term and long-term seed storage, germination ability and germination process, methods of pre-sowing seed preparation). 9. Introduction of woody plants - definition of the term, phases of introduction. Benefits of introduction and possible environmental risks. 10. Invasive trees, overview and characteristics of the most important taxa. Ecological, economic and health consequences of invasions. 11. The most important dendrological objects in Slovakia (Mlyňany Arboretum, Borová hora Arboretum, Kysihýbel Arboretum, Topoľčianky Castle Park). 12. Introduction to arboriculture, protection and care of trees growing outside the forest. The exercises are aimed at practical recognizing the most important coniferous and deciduous both native and introduced trees. During the summer semester, dealing with woody plants in the winter (in a sterile state), the specific characteristics of woody plants (general habitus of the wood, buds, thorns, specific color of the	



surface of the branch, pubescence, cork lamellas, etc.). During the growing season, recognizing the shape of the leaves and flowers..					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 82					
A	B	C	D	E	FX
71.95	13.41	7.32	7.32	0.0	0.0
<b>Provides:</b> Ing. Peter Kelbel, Dr.					
<b>Date of last modification:</b> 19.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ SDPa/15	<b>Course name:</b> Diploma Thesis Seminar
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 254	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ SDPb/15	<b>Course name:</b> Diploma Thesis Seminar
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 215	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ SDPc/15	<b>Course name:</b> Diploma Thesis Seminar
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 218	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ SDPd/15		<b>Course name:</b> Diploma Thesis Seminar			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 4.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 216					
A	B	C	D	E	FX
85.19	10.65	2.78	0.46	0.93	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ DPO/14		<b>Course name:</b> Diploma Thesis and its Defence			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 20					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 230					
A	B	C	D	E	FX
58.7	24.78	10.0	4.78	1.74	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 17.02.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚBEV/ EMK/15		<b>Course name:</b> Environmental Microbiology					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present							
<b>Number of ECTS credits:</b> 5							
<b>Recommended semester/trimester of the course:</b>							
<b>Course level:</b> II., III.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Attendance of practicals (at least 90%), final oral examination							
<b>Learning outcomes:</b> To provide students data on participation of microorganisms in biosphere processes, characteristics of most frequently occurring microbial communities and interactions of microorganisms with other organisms.							
<b>Brief outline of the course:</b> Evolution and biodiversity of microorganisms, microorganisms in environment, the influence of abiotic factors on microorganisms, biogeochemical cycles, interactions between microorganisms and other organisms							
<b>Recommended literature:</b> 1. BERTRAND, Jean-Claude, et al. (ed.). Environmental microbiology: fundamentals and applications. Dordrecht: Springer, 2015. 2. MITCHELL, Ralph; GU, Ji-Dong (ed.). Environmental microbiology. John Wiley & Sons, 2010. 3. HUDECOVÁ, D.: Mikrobiológia 1. Bratislava: STU, 2002. 4. SCHMIDT, Tom. Topics in ecological and environmental microbiology. Elsevier, 2012. 5. SIGEE, David. Freshwater microbiology: biodiversity and dynamic interactions of microorganisms in the aquatic environment. John Wiley & Sons, 2005. 6. VAN ELSAS, Jan Dirk, et al. Modern soil microbiology. CRC press, 2006.							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 80							
A	B	C	D	E	FX	N	P
57.5	20.0	1.25	0.0	2.5	1.25	0.0	17.5

<b>Provides:</b> doc. RNDr. Peter Pristaš, CSc., RNDr. Lenka Maliničová, PhD., RNDr. Mária Piknová, PhD.
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<b>Date of last modification:</b> 23.06.2022
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<b>Approved:</b>
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## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ ETOP/08		<b>Course name:</b> Etology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Thematical presentation Oral examination					
<b>Learning outcomes:</b> To teach the students to know and to be aware of the importance of the behavioural aspect in biological sciences					
<b>Brief outline of the course:</b> History and development of ethology. Ethological methods. The innate forms of behaviour. The simplest forms of learning – conditioning and instrumental learning. Higher form of learning. Social behaviour. Sexual behaviour. Play behaviour. Biological rhythms. Orientation in space and animal migrations. Communication systems of animals. Emotions. Aggression in animal and human behaviour. Abnormal forms of behaviour					
<b>Recommended literature:</b> 1. J.B. Balcombe: Second nature. The inner life of animals. Palgrave/McMillan, 2010. 2. T.J. Carew: Behavioral Neurobiology. Sinauer Assoc., Sunderland, 2000.					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 657					
A	B	C	D	E	FX
34.86	26.64	26.03	9.28	2.89	0.3
<b>Provides:</b> RNDr. Igor Majláth, PhD., RNDr. Natália Pipová, PhD.					
<b>Date of last modification:</b> 08.04.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ EB1/99	<b>Course name:</b> Evolutionary Biology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> In the written exam, the student must demonstrate, in addition to knowledge in the field of evolutionary biology, knowledge of analytical and synthetic thinking when solving the answers to problem-formulated questions, while using knowledge from the entire bachelor's and master's studies of his field.	
<b>Learning outcomes:</b> Graduates of the course will gain an overview of evolutionary theories in the past and today, and based on the most modern scientific knowledge about macro- and microevolutionary processes in living nature at various levels of investigation and knowledge, they should be able to analytically solve scientific, but also philosophical questions in the field of evolutionary theory. He is able to argue and critically evaluate different views on evolution and apply his knowledge in different types of work tasks not only in an academic environment, but also in practice, e.g. in agriculture, ecology, environmental protection and the like.	
<b>Brief outline of the course:</b> 1. Introduction to evolutionary biology. Historical development of ideas about the evolution of life. Evidence of the theory of evolution. 2. The origin and evolution of the first forms of life on Earth. 3. Theory of natural selection. 4. Molecular evolution I: Evolutionary processes at the gene level. Molecular evolution. 5. Molecular evolution II: Evolutionary processes at the level of species and populations. 6. Molecular evolution III: Evolution of genetic systems. 7. Reproductive strategies of plants, sexuality, asexuality and evolution. 8. Macroevolution and microevolution. Types of speciation. Evolutionary trends of green plants. 9. Extinction - a sad but natural part of evolution. 10. Overview of animal evolution. 11. Origin and development of man I. 12. Origin and development of man II.	
<b>Recommended literature:</b> Mayr, E.: Co je evoluce. Aktuální pohled na evoluční biologii. Academia Praha, 2009. Flegr, J.: Evoluční biologie. Academia Praha 2005	

<p>Kejnovský, E., Hobza, R.: Evoluční genomika. (<a href="http://www.evolucnigenomika.cz/Skripta/Evolucni%20genomika%20skripta%202008.pdf">http://www.evolucnigenomika.cz/Skripta/Evolucni%20genomika%20skripta%202008.pdf</a>) 2009</p> <p>Futuyma, D.J.: Evolution. Sinauer Associates, Sunderland, 2005.</p> <p>Briggs D., Walters S. M.: Proměnlivost a evoluce rostlin. Univerzita Palackého, Olomouc, 2001.</p> <p>Dobzhansky T. et al.: Evolution. San Francisco 1977.</p> <p>E.J.Larson : Evolúcia. Neobyčajná história jednej vedeckej teórie. Slovart, 2006.</p>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 644					
A	B	C	D	E	FX
12.11	22.36	25.47	23.76	14.75	1.55
<b>Provides:</b> prof. RNDr. Pavol Mártonfi, PhD., prof. RNDr. Beňadik Šmajda, CSc., prof. RNDr. Eva Čellárová, DrSc.					
<b>Date of last modification:</b> 24.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ FLS/19	<b>Course name:</b> Flora of Slovakia
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 1 <b>Per study period:</b> 14 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b> 1., 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Exam done more than 60%. The excursion is a half-day, focused on the flora of the selected area. Completing the excursion is a condition for participation in the exam.	
<b>Learning outcomes:</b> Get an overview of plant groups and species growing in Slovakia. Get to know in more detail the diversity of selected groups of plants in relation to the territory of Slovakia. Ability to recognize the most important local species, families and communities of plants.	
<b>Brief outline of the course:</b> 1. Phytogeographical division of Slovakia. Methods of mapping of the species and biotopes. Phytocoenological relevés. Vertical and horizontal vegetation levels. Types of biotopes. Herbarium collections in Slovakia. 2. Diversity of waters and terrestrial ferns. 3. Diversity of selected genres of Ranunculaceae, Hypericaceae, Apiaceae, Violaceae. 4. Campanulaceae, Boraginaceae, Fabaceae, Fagaceae 5. Lamiaceae, Scrophulariaceae, Brassicaceae, Rosaceae 6. Orchidaceae, Iridaceae 7. Asteraceae 8. Grasses and grasses-like groups from Poaceae, Juncaceae, Cyperaceae, Typhaceae 9. Forests and forest flora. Flora of lowland rivers. 10. Mountain flora. Ruderal flora. Segetal flora. Flora of meadows and pastures. 11. Bogs. Saline sites. Peat-bogs. East-carpathian endemics 12. Alien species. Invasions. Field course. Mapping in the field.	
<b>Recommended literature:</b>	
<b>Course language:</b> Slovak, English	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 12					
A	B	C	D	E	FX
8.33	41.67	33.33	16.67	0.0	0.0
<b>Provides:</b> RNDr. Matej Dudáš, PhD., prof. RNDr. Pavol Mártonfi, PhD.					
<b>Date of last modification:</b> 11.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/FG/14	<b>Course name:</b> Functional Genomics
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II., III.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Full-time form of practical teaching: active participation in practicals, practical courses protocols, written exam. In case of distance learning: active participation in practicals (the online method) using the MOODLE course UBEV/FG/14 Funkčná genomika, practical courses protocols, written exam.	
<b>Learning outcomes:</b> Functional genomics attempts to answer questions about the function of DNA at the levels of genes, RNA transcripts, and proteins. A key characteristic of functional genomics studies is their genome-wide approach to these questions, generally involving high-throughput methods rather than a more traditional “gene-by-gene” approach. The outcome of this course will be understanding of the approaches and methods used in functional genomics and their application in research as well as in practice.	
<b>Brief outline of the course:</b> <ul style="list-style-type: none"> <li>• Introduction to functional genomics, Biological databases and other resources for functional genome analysis, A real-case applications of the functional genomics</li> <li>• Genome and functional genomics: sequenced model organisms, conceptual and methodological input of genome sequencing, structural vs. functional genome annotation</li> <li>• Genome-wide reverse genetics: techniques to create collections of genome-wide mutants and their use in functional genomics</li> <li>• Transcriptomics: methods to obtain transcriptome data, in silico processing of transcriptomic data, differential expression</li> <li>• Proteomics: methods to obtain proteome data, quantitative vs. qualitative proteomics, data analysis, data mining</li> <li>• Metabolomics: methods to obtain metabolomic data, quantitative vs. qualitative metabolomics, data analysis, data mining</li> <li>* Interactomics - protein networks, methods in interactome and signalome studies, data analysis, practical use of the acquired knowledge on interactome and signalome</li> </ul>	
<b>Recommended literature:</b> J. Pevsner: Bioinformatics and Functional Genomics, 3rd Edition, ISBN: 978-1-118-58178-0 Internet sources	

<b>Course language:</b> English							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 158							
A	B	C	D	E	FX	N	P
17.72	28.48	27.85	8.86	13.29	1.27	0.0	2.53
<b>Provides:</b> doc. RNDr. Katarína Bruňáková, PhD., RNDr. Linda Petijová, PhD., RNDr. Miroslava Bálintová, PhD., doc. MVDr. Mangesh Ramesh Bhide, PhD.							
<b>Date of last modification:</b> 26.11.2021							
<b>Approved:</b>							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ GB1/03	<b>Course name:</b> Geobotany
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Active participation in field exercises. 2. Elaboration of a semester's work (recording in the field, species herbarium of detected vascular plants, classification at the class level and the reasons that conditioned it, brief comparison with similar communities based on the literature) 3. Written examination in the form of a test, which must be completed with at least 50%.	
<b>Learning outcomes:</b> Get an overview of the classification of vegetation, the distribution of plants and the relationships between plants. Get a basic idea of the practical use of this knowledge in botany, ecology and nature conservation. To teach students to take field notes and process them.	
<b>Brief outline of the course:</b> 1. basic information about phytocenology, its goals 2. brief history of phytocenology, basic terms and literature 3. Zurich-Montpellier school, methodological foundations, data collection 4. analysis of the obtained phytocenological data (principles, database and statistical programs used in phytocenology), 4. phytocenological nomenclature code. 5. ecological assessment of vegetation (indirect indication vs directly measured/obtained data). 6. syntaxonomic and ecological assessment of basic biotopes in the Central European area 7. pioneer vegetation, 8. synanthropic vegetation 9. Vegetation of wetlands 10. alpine vegetation, 11. herbaceous vegetation 12. Vegetation of forests and bushes 13. examples of phytocenological case studies and the use of phytocenology in practice.	
<b>Recommended literature:</b> Dengler, J., Chytrý M., Ewald, J., 2008: Phytosociology. In: Sven Erik Jørgensen and Brian D. Fath (Eds), General Ecology. Vol. [4] of Encyclopedia of Ecology, pp. 2767-2779. Elsevier, Oxford.	



Moravec, J. a kol.: Fytocenologie, Academia Praha, 1994.

Weber, H. E., Moravec, J. & Theurillat, J.-P. 2000. International Code of Phytosociological Nomenclature. 3rd edition. – J. Veg. Sci. 11: 739–768.

Valachovič M. a kol., 1995: Rastlinné spoločenstva Slovenska 1. Pionierska vegetácia. Veda, Bratislava.

Jarolínek I. a kol., 1997: Rastlinné spoločenstva Slovenska 2. Synantropná vegetácia. Veda, Bratislava.

Valachovič M. a kol., 2001: Rastlinné spoločenstva Slovenska 3. Vegetácia mokradí. Veda, Bratislava.

Kliment J., Valachovič, M. a kol., 2007: Rastlinné spoločenstva Slovenska 4. Vysokohorská vegetácia. Veda, Bratislava.

Hegedúšová Vantarová, K., Škodová, I. a kol., 2014: Rastlinné spoločenstva Slovenska 5. Travinno-bylinná vegetácia. Veda, Bratislava.

Chytrý, M. a kol., 2013: Vegetace České republiky 4. Lesní a křovinová vegetace. Academia, Praha.

Chytrý, M. a kol., 2010: Katalog biotopů České republiky. AOPK, Praha.

Stanová, V., Valachovič, M. a kol., 2002: Katalóg biotopov Slovenska. DAPHNE, Bratislava.

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 42

A	B	C	D	E	FX
52.38	23.81	21.43	2.38	0.0	0.0

**Provides:** Ing. Richard Hrivnák, PhD.

**Date of last modification:** 30.07.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚGE/ GDPZ/18	<b>Course name:</b> Geographical Information Systems and Remote Sensing
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> EN Successful study of this subject assumes active presence on the practicals and passing 2 practical tests reaching at least the mark E (50 points out of 100). The tests are performed in the mid-term and end of the semester.	
<b>Learning outcomes:</b> Knowledge: Students will acquire basic knowledge about the theoretical and methodological aspects of geographic information systems and remote sensing methods, an overview of the methods of acquisition, processing, distribution and analysis of geographic data and the possibilities of their application in environmental practice; Skills: Practical skills in software processing of geographic data in GIS, spatial analysis and cartographic visualization; they will also acquire the basics of principles and applications of remote sensing methods, processing of multispectral satellite images, calculation of spectral indices and image classification, processing of lidar data. Competences: Ability to independently design a project for solution in GIS, including suitable digital representation of objects in the country, methods of data collection, processing and spatial analysis, ability to present written and graphic work of own and team work. Orientation in the selection of suitable RS methods for environmental applications.	
<b>Brief outline of the course:</b> Lectures: Main areas of application of geographic information systems and remote sensing of the Earth in practice. Used hardware, software, availability of digital spatial data. Principles of digital representation of territory in GIS (raster, vector format), coordinate systems. Principles of DPZ methods. Data collection in the field using GPS, UAV, laser scanning. Scanning of existing maps and georeferencing. Basic principles of creation of cartographic outputs - creation of thematic maps in GIS. Maps on the Internet, Google Maps, Google Earth, OpenStreetMaps. Exercises: Basic presentation and control of the ArcGIS program, working with files, working with an attribute table, importing/exporting data, defining a coordinate system, principles of representing point, line and area phenomena, creating map outputs. Work with GPS, UAV and terrestrial laser scanning devices, basic processing of multispectral satellite scenes.	
<b>Recommended literature:</b>	

HOFIERKA, J., KAŇUK, J., GALLAY, M. 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach, 192 s.

KAŇUK, J., 2015: Priestorové analýzy a modelovanie. Vysokoškolské učebné texty. Prírodovedecká fakulta Univerzity Pavla Jozefa Šafárika v Košiciach. 114 s.

SEDLÁK, V., 2017: Globálne navigačné satelitné systémy. Vysokoškolské učebné texty. Prírodovedecká fakulta Univerzity Pavla Jozefa Šafárika v Košiciach. 157 s.

TUČEK, J. 1998: Geografické informační systémy – principy a praxe. Computer Press, Praha. 424 s.

ŽELEZNÝ, M. (2012): Dálkový průzkum Zěme (skriptá), Západočeská univerzita v Plzni, Katedra kybernetiky. 93 s. URL: <http://www.kky.zcu.cz/uploads/courses/dpz/DPZ-prednasky.pdf>

CANADIAN CENTRE FOR REMOTE SENSING (2012): Fundamentals of Remote Sensing (učebný text v angličtine, in English), 256 s. URL: <http://www.nrcan.gc.ca/earth-sciences/geography-boundary/remote-sensing/fundamentals/1430>.

LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 2001: Geographic Information Systems and Science. John Wiley & Sons.

LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 1999: Geographical Information Systems: Principles, Techniques, Management and Applications. John Wiley & Sons.

WILSON, J. P., FOTHERINGHAM, A. S. 2008: The Handbook of Geographic Information Science. Blackwell Publishing

**Course language:**

Slovak or English

**Notes:**

**Course assessment**

Total number of assessed students: 0

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

**Provides:** doc. Mgr. Michal Gallay, PhD., doc. RNDr. Ján Kaňuk, PhD.

**Date of last modification:** 12.07.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ LR1/03	<b>Course name:</b> Healing Plants
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 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%.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 1. Introduction to the study of medicinal plants. Plant organs. Effects of herbal drugs. 2. Drug contents. 3. Origin of medicinal plants. 4. Cultivation of medicinal plants 5. Collection of medicinal plants 6. Medicinal plants from the families Papaveraceae, Droseraceae, Hypericaceae, Rosaceae 7. Medicinal plants from the Malvaceae Ericaceae family. 9. Medicinal plants from the families Scrophulariaceae, Plantaginaceae, Lamiaceae. 10. Medicinal plants from the families Caprifoliaceae, Apiaceae, Valerianaceae. 11. Medicinal plants from the families Asteraceae, Equisetaceae, Ginkgoaceae. 12. Practical use of medicinal plants. 13. Poisonous plants.	
<b>Recommended literature:</b>	
<b>Course language:</b> Slovak, English	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 433					
A	B	C	D	E	FX
30.02	25.4	18.71	10.39	8.08	7.39
<b>Provides:</b> RNDr. Matej Dudáš, PhD.					
<b>Date of last modification:</b> 11.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KF/DF2p/03	<b>Course name:</b> History of Philosophy 2 (General Introduction)
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> The condition for awarding the evaluation will be the active approach of students to fulfilling their study obligations, independent work with selected philosophical texts in the library, active participation and creative work in seminars. In connection with the possibility of interrupting face-to-face teaching, there will be greater demands on the student's independent study and the processing of professional literature, which will be continuously evaluated, using e-mail to communicate with the teacher, at the end of the semester, preparing and handing in the semester's seminar work by the set date, or also passing a knowledge test - about which the students will be informed in advance in sufficient time.	
<b>Learning outcomes:</b> Deepening knowledge about the development of spiritual culture in the European spiritual space and pointing out the most important sources of this development: (1) ancient philosophy and science, (2) Christianity as the second pillar of Europe, (3) the Renaissance and the emergence of modern science (mathematical natural science ) as the third pillar of European development. Development of critical thinking skills, active position in professional (ethics of science), public and private life (ethics of responsibility). Transcending narrowly specialized views of the world.	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b> Antológia z diel filozofov. Predsokratovci a Platon. Zost. J. Martinka. Bratislava: Nakladateľstvo Epocha 1970; Antológia z diel filozofov. Od Aristotela po Plotina. Zost. J. Martinka. Bratislava: Nakladateľstvo Pravda 1972. Predsokratovci a Platon. Antológia z diel filozofov. Zost. J. Martinka. Bratislava: Vydavateľstvo Iris 1998. Od Aristotela po Plotina. Antológia z diel filozofov. Zost. J. Martinka. Bratislava: Vydavateľstvo IRIS 2006. Anzenbacher, A.: Úvod do filozofie. Prel. K. Šprunk. Praha: SPN 1990. Barthes, R.: Mytologie. Prel. J. Fulka. Praha: Dokořán 2004. Bělohradský, V.: Společnost nevolnosti. Eseje z pozdější doby. Praha: SLON 2009. Benjamin, W.: Iluminácie. Prel. A. Bžoch; J. Truhlářová. Bratislava: Kalligram 1999. Borges, J. L.: Borges ústne. Prednášky a eseje. Prel. P. Šišmišová. Bratislava: Kalligram 2005. Cassirer, E.: Esej o človeku. Prel. J. Piaček. Bratislava: Nakladateľstvo Pravda 1977. Debord, G.: Společnost spektaklu. Prel. J. Fulka; P. Siostrzonek. Praha: Nakladatelství :intu: 2007. Farkašová, E.: Na rube plátna. Bratislava: Vydavateľstvo Spolku slovenských spisovateľov 2013.	

Feyerabend, P.: Věda jako umění. Prel. P. Kurka. Praha: JEŽEK 2004. Freud, S.: Nepokojenost v kultuře. Prel. L. Hošek. Praha: Hynek 1998. Hadot, P.: Co je antická filosofie. Prel. M. Křížová. Praha: Vyšehrad 2017. Hippokratés: Vybrané spisy. Prel. H. Bartoš; J. Černá; J. Daneš; S. Fischerová. Praha: OIKOYMENH 2012. Husserl, E.: Filosofie jako přísná věda. Prel. A. Novák. Praha: Togga 2013. Kuhn, T. S.: Štruktúra vedeckých revolúcií. Prel. J. Viceník. Bratislava: Nakladateľstvo Pravda 1981. Leško, V., Mihina, F. a kol.: Dejiny filozofie. Bratislava. Iris 1993. Leško, V.: Dejiny filozofie I. Od Tálesa po Galileiho. Prešov: v. n. 2004, 2007. Leško, V.: Dejiny filozofie II. Od Bacona po Nietzscheho. Prešov: v. n. 2008. McLuhan, M.: Jak rozumět médiím. Extenze člověka. Prel. M. Calda. Praha: Mladá fronta 2011. Patočka, J.: Duchovní člověk a intelektuál. In: Patočka, J.: Péče o duši III. Praha: OIKOYMENH 2002, s. 355 - 371. Popper, K. R.: Otevřená společnost a její nepřátelé I. Platónovo zařikávání. Prel. M. Calda; J. Moural. Praha: OIKOYMENH 2011. Sloterdijk, P.: Kritika cynického rozumu. Prel. M. Szabó. Bratislava: Kalligram 2013. Störig, H. J.: Malé dějiny filozofie. Prel. P. Rezek. Praha: Zvon 1991. Wittgenstein, L.: Filozofické skúmania. Prel. F. Novosád. Bratislava: Nakladateľstvo Pravda 1979. Wright von, H. G.: Humanizmus ako životný postoj. Prel. M. Žitný. Kalligram 2001. Žižek, S.: Mor fantázií. Prel. M. Gálisová; V. Gális. Bratislava: Kalligram 1998.

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 746

A	B	C	D	E	FX
60.59	14.21	12.6	8.58	3.35	0.67

**Provides:** doc. PhDr. Peter Nezník, CSc.

**Date of last modification:** 11.07.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KF/IH2/03	<b>Course name:</b> Idea Humanitas 2 (General Introduction)
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 100% graded credit: 40% (evaluated participation in seminars, processing of partial seminar work - separate assignment) 60% (final seminar work - student project). In the case of implementation of the classical form of teaching - face-to-face - active participation of the student in the seminar; study and reflection of assigned philosophical texts, attempt to interpret them. In the case of the introduction of distance education (as was the case due to Covid-19), the student will have to actively fulfill tasks of a partial nature, where increased demands will be placed on the student and his independent work with philosophical texts and literature. Tasks will be assigned to the students by the teacher on an ongoing basis. The student must study the assigned philosophical texts, think through and process them, submit them as a seminar paper, i.e. in written form. In both cases, the study of literature is necessary to pass the subject. The conclusion of the subject is the preparation of a seminar paper - the final seminar paper - in the range of at least 10 - 12 pages of A4 (with compliance with the bibliographic standard of the Department of Philosophy (KF) for seminar and qualification papers).	
<b>Learning outcomes:</b> To supplement and expand the interest of natural science students in social science issues related to the issues of the development of philosophy, science and human leadership, which are manifested in the urgent problems of today's world and society. Special emphasis is placed on the formation of humanistic ideas, their origin, transformation and possible pitfalls and risks. In addition to thinking about serious questions of the past and present, it also includes thinking about the present and the current contexts of major topics in philosophy and Western culture in particular. Therefore, the preparation and implementation of a program aimed at cooperation with alternative directions of pedagogy in the conditions of our transforming education system is understood as a practical output.	
<b>Brief outline of the course:</b> The age of the image of the world. Doubt as a principle of philosophy. The emergence of the image of the world (Weltbild); the differences of ancient theoria, medieval scientia, the emergence of mathematical natural science. Science as an operation (Betrieb); institutionalization of science. Philosophy, science and the modern world. The movement of human life: acceptance, defense, freedom as struggle, submission to finitude. The modern world and the search for meaning. Bureaucracy, impersonality, predominance of technocratic approaches. Fatigue as a modern threat	



to Europe. The paths to freedom lead through the rediscovery of one's own Self and creativity. The basic condition for the educability of any education is the care of the soul. The crisis of European humanity. Antiquity. Philosophy - the emergence of a special community of people, the beginnings of education - paideia. The winding road of leadership. The origin and birthplace of calculating thinking. Europe and the post-European era. Care of the soul as a basic idea of Patočka's philosophy. The difference in the position of Plato and Democritus in understanding the care of the soul. The idea of caring for the soul and Aristotle.

**Recommended literature:**

Hadot, P.: What is ancient philosophy. Transl. M. Křížová. Prague: Vyšehrad 2017. Hegel, G. W. F.: Phenomenology of Spirit. Prague: NČSAV 1960 Husserl, E.: The Crisis of European Humanity and Philosophy. In: Crisis of European sciences and transcendental phenomenology. Prague: Akademie 1996. Mokrejš, A.: Eros as a Theme of Greek Thought. Prague: Triton 2009. Patočka, J.: Péče o duši I. Prague. OIKOYMENH 1996. Patočka, J.: Care of the soul II. Prague. OIKOYMENH 1999. Vernant, J.-P.: The beginnings of Greek thought. Prague: OIKOYMENH 1995. Wright von, G.H.: Humanism as a life attitude. Bratislava: Kalligram 2001.

**Course language:**

**Notes:**

**Course assessment**

Total number of assessed students: 12

A	B	C	D	E	FX
91.67	8.33	0.0	0.0	0.0	0.0

**Provides:** doc. PhDr. Peter Nezník, CSc.

**Date of last modification:** 24.08.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/IMU1/03		<b>Course name:</b> Immunology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Recognition. Oral examination.					
<b>Learning outcomes:</b> This course introduces the students to the basic concepts of immunology as well as highlights the role and importance of immunology in various human diseases. The aim of Immunology lessons is the presentation of the organization and function of the immune system, as well as the comprehension of complex molecular and cellular interactions during the induction of immune responses.					
<b>Brief outline of the course:</b> Basic immunology: Lymphatic System Anatomy, The Innate Immune System, The Induced Responses of Innate Immunity, The Adaptive Immune Response, Antigens and Antibodies, Antigen Recognition by B-cell and T-cell Receptors, Antigen Presentation to T-lymphocytes, Complement, Clinical immunology: Allergy and other Hypersensitivities, Autoimmunity and Transplantation, Tumor Immunology, Disorders of The Immune System.					
<b>Recommended literature:</b> Janeway Ch. A., Travers P., Walport M., Schlomchik M.: Immunobiology. Garland Science, 2004 Murphy, K. (2012): Janeway's Immunobiology. 8th ed. Garland Science Delves, P.J. et al. (2011): Roitt's essential immunology 12th ed Wiley-Blackwell					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 1017					
A	B	C	D	E	FX
39.82	23.3	24.09	7.08	2.06	3.64
<b>Provides:</b> RNDr. Vlasta Demečková, PhD.					
<b>Date of last modification:</b> 13.05.2021					

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ UGM1/03	<b>Course name:</b> Introduction to Gene Manipulations
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Active participation in seminars - elaboration of assignments and protocols for practical exercises completed by continuous assessment (30% of the total assessment), written examinations of the content of lectures (60% of the total assessment), oral exam (10% of the total assessment).	
<b>Learning outcomes:</b> To provide the students with the principles of preparation and application of techniques of recombinant DNA.	
<b>Brief outline of the course:</b> Overview of the basic structure and functioning of biomolecules (proteins, nucleic acids), basic concepts and chemical principles applied to biological systems (water as a solvent, buffers, pH), general laboratory techniques (buffer preparation, centrifugation, dialysis, lyophilization). Enzymes used in gene manipulation (nucleases, restriction endonucleases, lysozyme, proteinases, etc.). Cell lysis methods. Principles of individual isolation units and tasks of individual components, isolation of genomic DNA, methods of plasmid isolation, isolation of DNA from different cell types, isolation and specifics of work with RNA molecules. Electrophoretic techniques (agarose and polyacrylamide, resolution, sensitivity, voltage, color, visualization, different types of electrophoresis. Spectroscopic analysis of biomolecules (general principles, overview of methods and their principle, UV-Vis spectroscopy, MALDI-TOF). and analysis of biomolecules by chromatography. Production of proteins and their purification and characterization (preparation of cell extracts, protein stabilization, precipitation, selection of purification technique by tags) Hybridization methods (Southern, Northern, Western).	
<b>Recommended literature:</b> Old, R.W., Primrose, S. B.: Principles of Genetic Manipulation. An Introduction to Genetic Engineering. Blackwell Scientific Publication, London, 1992 S.B. Primrose and R.M. Twyman: Principles of gene manipulation and genomics. 7th Edition, 2006. ISBN 140513544 Fitzgerald-Hayes, M and Reichsman, F: DNA and Biotechnology. Academic Press, 2009. Third edition. ISBN 9780080916354 T.A.Brown: Gene Cloning and DNA Analysis: An Introduction. Wiley-Blackwell, 2016. 7th edition. ISBN: 978-1-119-07254-6	

<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 285					
A	B	C	D	E	FX
60.7	28.42	8.07	2.11	0.35	0.35
<b>Provides:</b> RNDr. Mariana Kolesárová, PhD.					
<b>Date of last modification:</b> 31.05.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ BIL/19	<b>Course name:</b> Lichen Biology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 1., 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> <ol style="list-style-type: none"> <li>1. 100% participation of exercises.</li> <li>2. learn how to work with the key for determining lichens, practical use</li> <li>3. show and demonstrate the knowledge acquired during the exercises in TLC, HPLC, NMR</li> <li>4. be able to assemble the equipment necessary for the isolation of substances (e.g. secondary metabolites)</li> <li>5. demonstrate theoretical knowledge in the field of lichenology in the form of an oral exam</li> </ol>	
<b>Learning outcomes:</b> After successfully completing the subject, the student should be able to use the key for identification of lower plants - lichens, understand and better understand the meaning of symbioses and thus specifically lichenism, understand the meaning of photobiont and mycobiont, be able to distinguish lichen from other lower plants in nature. The student should understand the significance of the secondary metabolites of lichens, how they are formed and how they are used in practice. As part of the practical part, methods for the isolation and identification of secondary metabolites such as spot-test, TLC, HPLC should be mastered. These methods are connected with basic knowledge of chemistry such as calculations, dilutions, preparation of solutions.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. introduction to the study of lichenology and concepts</li> <li>2. history from antiquity to the present</li> <li>3. Symbiosis and lichenism</li> <li>4. the role of photobiont and mycobiont in lichenism</li> <li>5. Lichen thallus, types and subtypes</li> <li>6. reproduction and reproduction</li> <li>7. secondary metabolism of lichens and biosynthetic pathways</li> <li>8. biological and ecological role of lichens and their secondary metabolites</li> <li>9. extraction of secondary metabolites of lichens</li> <li>10. Methods for identification and separation of secondary metabolites: TLC (thin layer chromatography), column chromatography</li> <li>11. Methods for identification: HPLC (high-performance liquid chromatography)</li> <li>12. Methods for identification: NMR (nuclear magnetic resonance)</li> </ol>	

13. presentation of results from the practical part					
<b>Recommended literature:</b> recommended literature: Purvis: Lichens (2000) Ahmadjian The lichens (1973) Nash: Lichen Biology (2008) Ranković: Lichen secondary metabolites (2019)					
<b>Course language:</b> slovak, english					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 16					
A	B	C	D	E	FX
93.75	0.0	6.25	0.0	0.0	0.0
<b>Provides:</b> RNDr. Michal Goga, PhD., prof. RNDr. Martin Bačkor, DrSc.					
<b>Date of last modification:</b> 31.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ MVR/03		<b>Course name:</b> Mineral Nutrition			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Active participation in laboratory practicals. Reasoned non-attendance may be excused by the teacher for a maximum of 4 hours (one two-hour period). In the case of longer justified absence, the teacher will determine an alternative possibility to complete the missed lesson. 2. Before the practicals, the students will study the main theses of the task that will be carried out in the next lessons. Students will receive an exact list of tasks according to individual lessons at the beginning of the semester. 3. Students make a written record of the practicals. The students will evaluate the results of the practical experiments and draw up a conclusion. The form in which this activity will be checked is determined by the teacher at the beginning of the semester. After this check, the task is considered validly completed. 4. Practical tasks are considered to have been finally completed upon valid completion of all tasks. The exception is excused non-participation (point 1). Completing the practicals is obligatory before the participation in the exam. 5. The examination of the subject takes place orally. Students need to answer to two questions and have a max. 30 minutes to prepare. Any changes or modifications to the conditions for completing the subject due to the COVID19 pandemic or other serious reasons are continuously published on the subject's electronic bulletin board.					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b> Bhatla S.C., Lal M.A. Plant Physiology, development and metabolism. Springer Nature Singapore Pte Ltd. 2018					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 61					
A	B	C	D	E	FX
44.26	29.51	24.59	0.0	1.64	0.0



<b>Provides:</b> doc. RNDr. Peter Paľove-Balang, PhD.
<b>Date of last modification:</b> 31.07.2022
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ FRV1/03		<b>Course name:</b> Physiology of Plant Growth and Development			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> To learn about basic methods and approaches in physiology of plant growth and development. The student will learn the basic concepts related to plant development and deepen the basic knowledge about the regulation of individual processes. They will get acquainted with signal transmission in plants and the influence of various factors (light, phytohormones, ...) on the growth and development of plants at various levels. During the exercises, the student should master the basic preparation of growth media, work with a microscope and evaluate the results obtained.					
<b>Brief outline of the course:</b> Growth and morphogenesis: phases and kinetics; differentiation Hormones: metabolism and transport, physiological and developmental effects auxin, gibberellins, cytokinins, ethylene and abscisic acid Photomorphogenesis and etiolation. Phytochrome: properties, physiology, ecological functions, molecular mechanisms. Blue-light responses. Rhythms. Germination and dormancy. Regulation of flowering. Senescence and programmed cell death. Orientation in space: phototropism, gravitropism and nastic movements. Stress physiology.					
<b>Recommended literature:</b> Taiz L., Zeiger E., Plant physiology. Fifth edition. Sinauer ass., Sunderland 2010 Taiz L, Zeiger E, ed. 2018 Plant physiology and development, 6th editon, Oxford					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 119					
A	B	C	D	E	FX
36.13	22.69	17.65	14.29	6.72	2.52

<b>Provides:</b> Ing. Robert Gregorek, PhD., RNDr. Michaela Bačovčinová, PhD., doc. RNDr. Peter Paľove-Balang, PhD.
<b>Date of last modification:</b> 26.10.2021
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ FG1/03	<b>Course name:</b> Phytogeography
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 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.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 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).					
<b>Recommended literature:</b> 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.					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 388					
A	B	C	D	E	FX
38.92	22.42	21.13	8.25	8.51	0.77
<b>Provides:</b> prof. RNDr. Pavol Mártonfi, PhD., Mgr. Vladislav Kolarčík, PhD.					
<b>Date of last modification:</b> 24.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚBEV/ BTR1/06		<b>Course name:</b> Plant Biotechnology					
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 3 <b>Per study period:</b> 28 / 42 <b>Course method:</b> present							
<b>Number of ECTS credits:</b> 6							
<b>Recommended semester/trimester of the course:</b>							
<b>Course level:</b> I., II., III.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> Active participation at the practicals, protocols, oral examination							
<b>Learning outcomes:</b> To gain theoretical and practical knowledge on plant tissue culture in vitro.							
<b>Brief outline of the course:</b> 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 variation. Secondary metabolites production, bioreactors, biotransformation, immobilization and elicitation. Genetic transformation, direct and indirect methods of transformation. Types of vectors, promoters, 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.							
<b>Recommended literature:</b> 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							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 179							
A	B	C	D	E	FX	N	P
40.78	18.44	12.29	9.5	11.17	2.79	0.0	5.03

<b>Provides:</b> RNDr. Miroslava Bálintová, PhD., prof. RNDr. Eva Čellárová, DrSc., RNDr. Jana Henzelyová, PhD.
<b>Date of last modification:</b> 02.02.2021
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ EKR1/03	<b>Course name:</b> Plant Ecology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Participation in seminars (even in the case of online teaching) Students are obliged to participate in seminars. The relevant teacher who conducts the seminar will excuse the justified non-participation of the student (inability to work, family reasons, etc.) at a maximum of two seminars during the semester without the need for substitute performance. In case of long-term justified absence (for example due to incapacity for work), the relevant teacher will determine the student's alternative form of mastering the missed material; 2. Demonstration of knowledge and expertise in the field of ecology acquired at lectures and seminars (determination of morphological and anatomical features related to environmental factors) 3. Demonstration of sufficient skills in the use of methodologies that are part of laboratory exercises 4. Pass the oral exam, which will also include a written part in the form of a short description of ecological relationships from the given picture.	
<b>Learning outcomes:</b> The student will understand the main relationships of plants with the environment and other organisms. He will be able to recognize the needs of plants, how plants adapt to the environment and other organisms. Based on this, he will understand the distributional and formative values of biotic and abiotic ecological conditions, as well as the linking of plants into complex plant communities, which is also related to other organisms in ecosystems. The student will be able to recognize the major biomes of the Earth and the problems that plants face, as well as what solutions or mechanisms they have developed to survive in such an environment. Finally, he will learn how the changing environment affects plant organisms and plant communities.	
<b>Brief outline of the course:</b> 1. Plant ecology, subject, research approaches and methodology, autecology, ecology of communities 2. Factor ecology I – plants and water (drought) 3. Factor ecology II – plants and atmosphere including wind 4. Factor ecology III – plants and light 5. Factor ecology IV – plants and soil 6. Factor ecology V – plants and interactions with other organisms 7. Zonobiomes on Earth	



8. tropical biomes 9. Subtropical biomes 10. Temperate climate, maritime to continental biomes 11. boreal and polar biomes 12. water biomes 13. Plants related to anthropogenic environmental changes					
<b>Recommended literature:</b> Breckle, S.-W. (2002). Walter's Vegetation of the Earth. Springer, 525 Schultze, E.D., Beck, E., Muller-Hohenstein, K. (2002). Plant Ecology. Springer, 702. Gurevich, J., Scheiner, S., Fox, G. (2006). The ecology of plants, Sinauer Associated, Inc. Publishers, 522 Lambers, H., Chapin III, F.S., Pons, T.L. (1998). Plant Physiological Ecology. Springer, Berlin, 540					
<b>Course language:</b> slovak, english					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 249					
A	B	C	D	E	FX
77.51	16.06	5.22	0.8	0.4	0.0
<b>Provides:</b> prof. RNDr. Martin Bačkor, DrSc., RNDr. Michal Goga, PhD., prof. Marko Sabovljević, Dr. rer. nat.					
<b>Date of last modification:</b> 31.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ ER1/01	<b>Course name:</b> Plant Embryology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 1 <b>Per study period:</b> 14 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 3	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Participation at the practices - work with permanent slides, work with living material, outline of the studied phenomena and their description 2. Passing the examination	
<b>Learning outcomes:</b> Student knows basic breeding strategies and reproduction ways of angiosperms. He/she is informed about micro- and megagametogenesis from archesporal cell up to mature gametophyte. He/she knows the origin of new organism and the processes leading to it. He/she is familiar with phenomena connected with embryo development and its relations to other parts of seeds. He/she is informed on apomixis. He/she knows the way from seed to photosynthesising plant of new generation. He/she obtains information on origin and development of the embryo of gymnosperms.	
<b>Brief outline of the course:</b> 1. Embryology as science 2. Breeding strategies 3. Female gametophyte 4. Male gametophyte 5. Pollination, progamogenetic phase of fertilization processes 6. Fertilization, gamogenetic and postgamogenetic phase, incompatibilities 7. Embryo, general characters and development 8. Embryo of monocotyledones and dicotyledones 9. Endosperm 10. Apomixis 11. Seed, germination of seeds 12. Embryology of gymnosperms	
<b>Recommended literature:</b> Erdelská O., Švubová R., Mártonfiiová L., Lux A. (2017): Embryológia krytosemenných rastlín. Veda, Bratislava Richards, A. J. (1997): Plant Breeding Systems. Chapman & Hall, London	
<b>Course language:</b>	

<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 116					
A	B	C	D	E	FX
37.07	27.59	18.97	9.48	6.9	0.0
<b>Provides:</b> RNDr. Lenka Mártonfiová, PhD.					
<b>Date of last modification:</b> 18.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/MR1/03	<b>Course name:</b> Plant Metabolism
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Active participation in laboratory practicals. Reasoned absence can be justified by the teacher for a maximum of 4 hours (one two-hour course) without the need for replacement. In the case of a longer justified absence, the teacher will determine an alternative form of mastering the missed teaching. 2. Before the practicals, students have to study the main theses of the task that will be realized. Students will receive an exact schedule of tasks according to individual lessons at the beginning of the semester. 3. Students make a written record of the practicals. Students will evaluate the results from and draw a conclusion. The form in which this activity will be checked is determined by the teacher at the beginning of the semester. After this check the task is considered validly completed. 4. Whole practicals are considered to be finally completed upon valid completion of all tasks. The exception is the justified non-participation (point 1). Completion of practicals is obligatory before the exam. 5. The exam of the subject takes place orally. Students ask two questions and have a max. 30 minutes to prepare. 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 course.	
<b>Learning outcomes:</b> The subject significantly deepens knowledge from the bachelor's degree. The student should gain an overview of the basic biochemical processes in plants. Emphasis is placed on understanding the principles of their functioning and their significance for plants. Acquaintance of students with basic biochemical research methods of plant metabolism within the practical part. The result of education is also the ability to process and express own results.	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b> Masarovičová E., Repčák M. et al. Fyziológia rastlín. 2. dopl. vydanie. Vyd. UK Bratislava 2008; Taiz L. et al. Plant Physiology and Development. Sixth edition. Sinauer ass., Sunderland 2014; Repčák M. et al. Návodý na cvičenia z fyziológie rastlín. 4. preprac. vyd. UPJŠ	

Košice 2014 Bhatla S.C., Lal M.A. Plant Physiology, development and metabolism. Springer Nature Singapore Pte Ltd. 2018					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 122					
A	B	C	D	E	FX
22.95	18.85	19.67	15.57	20.49	2.46
<b>Provides:</b> doc. RNDr. Peter Paľove-Balang, PhD.					
<b>Date of last modification:</b> 31.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ IOR/09	<b>Course name:</b> Plant Protection
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b> ÚBEV/VEK1/03	
<b>Conditions for course completion:</b> <ol style="list-style-type: none"> <li>1. Attending lectures is voluntary, participation in exercises is mandatory.</li> <li>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.</li> <li>3. Separate processing of a model example regarding effective temperatures and their significance for the development of plant pests and pathogens.</li> <li>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.</li> </ol>	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Integrated plant protection (IOR), basic concepts, history of plant protection.</li> <li>2. Symptoms of plant damage, harmful agents - basic division.</li> <li>3. Selected viral, bacterial and fungal plant diseases.</li> <li>4. Selected phytophagous animals.</li> <li>5. Procedures in plant protection - basic division.</li> <li>6. Chemical plant protection.</li> <li>7. Biological protection of plants.</li> <li>8. Integrated protection of plants in greenhouses.</li> <li>9. Integrated plant protection in agriculture (external areas).</li> </ol>	

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.					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 68					
A	B	C	D	E	FX
5.88	25.0	22.06	17.65	29.41	0.0
<b>Provides:</b> prof. RNDr. Martin Bačkor, DrSc., Ing. Martin Suvák, PhD.					
<b>Date of last modification:</b> 11.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ TR1/99	<b>Course name:</b> Plant Taxonomy
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 1. Lectures on the subject are not compulsory, but are highly recommended, exercises are compulsory. 2. Students must master the basic methods of collecting botanical samples in the field for various types of analysis, work with plant material in the karyological and palynological laboratory and in the flow cytometry laboratory, learn the basic principles of molecular taxonomy, be able to understand articles using phenetic and cladistic methods, be able to orient himself in the basic principles of botanical nomenclature. 3. An oral exam is part of the completion of the subject.	
<b>Learning outcomes:</b> The subject of plant taxonomy is a basic subject for understanding modern systematics of plants and its importance for the study of various taxonomic groups, the student is oriented in the used methods of taxonomic work and their evaluation, is able to create taxonomic hypotheses and design a way of verifying these hypotheses. He is able to use the knowledge in basic botanical research, but also to apply it to solving problems in plant breeding, in agricultural practice, in the evaluation of plant biota in plant protection and biodiversity preservation.	
<b>Brief outline of the course:</b> 1. Taxonomy of plants. The importance of classification and the problems associated with it. Information sources and taxonomic data. Morphology and anatomy, embryology, palynology, cytology, karyology, ecology, phytogeography. 2. Determination of taxonomic relationships. 3. Approaches to biological classification. Examples of past and present plant systems. The "Angiosperm Phylogeny Group IV" system. 4. Variability of plants and its study. Early works on plant variability. Multivariate data in taxonomy - phenetic data analysis. 5. The size of the plant genome and approaches to its study. Flow cytometry. Angiosperm genome size evolution. 6. Parallel and convergent evolution. Examples: parasitism, insectivory and C4-metabolism. 7. Basic principles of cladistics. 8. Cladistic studies - revealing the branches of evolution.	



9. Principles of molecular systematics of plants.
10. Basics of botanical nomenclature. International code of nomenclature of algae, fungi and plants.
11. Taxonomic publications and examples of taxonomic studies I. Examples from the genus <i>Viola</i> .
12. Taxonomic publications and examples of taxonomic studies II. Examples from the genus <i>Onosma</i> .
Exercises (they take place in blocks):
1. Introduction to plant taxonomy exercises. Herbarium documents and their meaning.
2. Fieldwork in botany, collection of samples, processing of plant material, practical demonstrations.
3.- 4. Palynological methods. Collection and preparation of samples, observation of preparations and their evaluation.
5.- 6. Karyological methods in plant taxonomy. Sampling, preparation of specimens, observation and evaluation of specimens.
7.- 8. Phenetic data analysis – examples and demonstrations of plant material processing, multivariate data analysis, clustering and ordination methods.
9.- 10. Use of flow cytometry in plant taxonomy. Determination of the degree of ploidy and the size of the plant genome. Determination of reproductive method of plants - FCSS (flow cytometric seed screen).
11.-12. Molecular systematics of plants. Parsimony analysis of DNA sequences, phenetic analysis of AFLP DNA fragments - examples and demonstrations.
13. Basics of botanical nomenclature. International code of nomenclature of algae, fungi and plants. Practical tasks.

#### Recommended literature:

Briggs D., Walters S. M.: Proměnlivost a evoluce rostlin. – CUP, UP Olomouc 2001.  
Mártonfi P.: Systematika cievnatých rastlín. 4. vydanie - Vydavateľstvo UPJŠ, Košice, 2013.  
Marhold K., Suda J.: Statistické zpracování mnohorozměrných dat v taxonomii (Fenetické metody). – Karolinum, UK Praha 2002.  
Turland et al. (Eds.): International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017  
Regnum Vegetabile - Koeltz Scientific Books, 2018. <https://www.iaptglobal.org/icn>  
Stuessy T. F.: Plant Taxonomy. - 2n Ed. New York 2009.  
Judd W. S., Campbell Ch. S., Kellogg E. A. & Stevens P. F., Donoghue M. J.: Plant Systematics. A Phylogenetic Approach, 4th edition. – Sinauer Associates, Sunderland, 2016.  
Simpson M. G.: Plant Systematics. – Elsevier, Amsterdam etc., 3. ed., 2019.

#### Course language:

#### Notes:

#### Course assessment

Total number of assessed students: 140

A	B	C	D	E	FX
37.14	21.43	21.43	10.0	7.14	2.86

**Provides:** prof. RNDr. Pavol Mártonfi, PhD., Mgr. Vladislav Kolarčík, PhD.

**Date of last modification:** 24.07.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ STFR/20	<b>Course name:</b> Plant stress physiology
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> <ol style="list-style-type: none"> <li>1. 100% participation at exercises and their pass</li> <li>2. demonstration of independence and practical skills when solving tasks in the exercises</li> <li>3. presentation of results at the end of the semester in the field of biotic and abiotic factors affecting plants</li> <li>4. proof the knowledge of the subject in the form of an oral exam</li> </ol>	
<b>Learning outcomes:</b> After completing the subject, the student should gain knowledge about biotic and abiotic influences on plants, plant reactions to stress and mechanisms of signal transmission, as well as mechanisms of adaptation and acclimatization in stressful conditions. Practical exercises will provide the student with laboratory skills in observing physiological changes and responses to biotic and abiotic factors. The student will become familiar with the basics of using a spectrophotometer, a fluorescence camera and other small laboratory devices used in plant stress physiology.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Functions of plants in different types of environment</li> <li>2. Characteristics of stress and common mechanisms of stress reactions</li> <li>3. Abiotic stress factors and their effect on plants - UV radiation</li> <li>4. Abiotic stress factors and their effect on plants - the effect of high and low temperatures</li> <li>5. Abiotic stress factors and their effect on plants - the effect of lack of water on plants</li> <li>6. Abiotic stress factors and their effect on plants - effect of lack of mineral nutrients</li> <li>7. Abiotic stress factors and their effect on plants - lack of oxygen in the soil</li> <li>8. Abiotic stress factors and their effect on plants - highly saline and acidic soils</li> <li>9. Abiotic stress factors and their effect on plants - toxic substances in the soil and in the air</li> <li>10. Biotic stress factors and their effect on plants - competition, allelopathy, mycorrhiza</li> <li>11. Biotic stress factors and their effect on plants - plant reactions to pathogenic organisms and protection from herbivores</li> <li>12. Presentation of the results on the selected topic of the impact of stress I. (presentation of student results)</li> <li>13. Presentation of the results on the selected topic of the impact of stress II. (presenting student results)</li> </ol>	

<b>Recommended literature:</b>					
Lectures					
articles from the Web of Science and Scopus databases					
Slováková, L., Mistrík I. 2007: Physiological processes of plants under conditions of stress, Bratislava					
Hirt H., 2009: Plant stress biology, Wiley-Blackwell					
Pessarakli M. ed., 2011: Handbook of Plant and Crop Stress, Third edition, CRC Press					
Taiz L, Zeiger E, ed. 2018 Plant physiology and development, 6th edition, Oxford					
<b>Course language:</b>					
slovak, english					
<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 14					
A	B	C	D	E	FX
78.57	21.43	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Michal Goga, PhD., RNDr. Michaela Bačovčinová, PhD.					
<b>Date of last modification:</b> 31.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/EP/14		<b>Course name:</b> Population Ecology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 1 <b>Per study period:</b> 14 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 3					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Oral examination Running evaluation: active (100%) participation in seminars and lectures preparation of the presentation to the given topic					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Population ecology includes study of the structure and dynamics of populations (chose population characteristics such as density/abundance, distribution/population dispersion patterns, natality, mortality) interactions between populations of organisms and environmental factors based on mathematical models, theories, and population methods applied in various ecosystems. Population ecology elucidates growth models and changes in populations.					
<b>Recommended literature:</b> Rockwood Larry L., 2006: Introduction to population ecology, 339 pp., Malden, Mass.: Blackwell					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 32					
A	B	C	D	E	FX
56.25	6.25	31.25	6.25	0.0	0.0
<b>Provides:</b> RNDr. Natália Raschmanová, PhD.					
<b>Date of last modification:</b> 11.07.2022					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KPPaPZ/PPZMg/12	<b>Course name:</b> Psychology and Health Psychology (Master's Study)
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 2 <b>Per study period:</b> 14 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for the continuous assessment during the semester: Active work (maximum 5 points, 2 absences are allowed). Preparation, presentation and discussion on a selected topic - max. 15 points. Written examination (maximum 30 points). Conditions for admission to the exam: min. 25 points. Conditions for the final assessment: Exam: written form (max. 50 points, min. 25 points) Conditions for successful completion of the course: participation in lessons, fulfillment of assignments and at least 66 points from the overall evaluation. Detailed information in the electronic bulletin board of the course in AIS2. The teaching of the subject will be realized by a combined method.	
<b>Learning outcomes:</b> The student will understand the basic concepts and theories of health psychology, can explain salutogenic factors as well as the consequences of risk behavior related to health. He is able to apply the knowledge especially in the field of prevention of burnout syndrome and support of mental health in the work of a teacher.	
<b>Brief outline of the course:</b> 1 Introduction to health psychology 2 Psychoimmunology 3 Personality factors and health 4 Social support as a protective factor in relation to health 5 Subjective well-being 6 Stress and stressful situations and ways to manage them 7 Burnout syndrome 8 Health-promoting behavior, mental hygiene 9 Health risk behavior 10 School as an important factor of health	
<b>Recommended literature:</b> Křivohlavý, J.: Psychologie zdraví. Portál, Praha 2001.	

Křivohlavý, J.: Psychologie nemoci. Grada, Praha, 2002.  
 Křivohlavý, J.: Psychologie moudrosti a dobrého života. Grada, Praha, 2009.  
 Kebza, V.: Psychosociální determinanty zdraví. Academia, Praha 2005.  
 Kahneman, D., Diener, E., Schwarz, N.(Eds), Well-Being. The Foundations of Hedonic Psychology. New York, Russell Sage Foundation, 2003.  
 Kaplan, R. M.: Zdravie a správanie človeka. SPN, Bratislava 1996.  
 Sarafino, E. P.: Health Psychology. Biopsychosocial interactions. John Wiley and sons 1994.  
 Baštecký, J., Šavlík, J., Šimek, J. 1993. Psychosomatická medicína. Praha: Grada  
 Tress, W., Krusse, J., Ott, J.: Základní psychosomatická péče. Portál, Praha 2008.

**Course language:**

slovak

**Notes:**

**Course assessment**

Total number of assessed students: 226

A	B	C	D	E	FX
19.47	25.22	25.66	13.27	15.93	0.44

**Provides:** PhDr. Anna Janovská, PhD., Mgr. Lucia Barbierik, PhD.

**Date of last modification:** 07.07.2021

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ ÚTVŠ/CM/13	<b>Course name:</b> Seaside Aerobic Exercise
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Completion: passed Condition for successful course completion: - active participation in line with the study rule of procedure and course guidelines - effective performance of all tasks- aerobics, water exercise, yoga, Pilates and others	
<b>Learning outcomes:</b> Content standard: The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature. Performance standard: Upon completion of the course students are able to meet the performance standard and: - perform basic aerobics steps and basics of health exercises, - conduct verbal and non-verbal communication with clients during exercise, - organise and manage the process of physical recreation in leisure time	
<b>Brief outline of the course:</b> Brief outline of the course: 1. Basic aerobics – low impact aerobics, high impact aerobics, basic steps and cuing 2. Basics of aqua fitness 3. Basics of Pilates 4. Health exercises 5. Bodyweight exercises 6. Swimming 7. Relaxing yoga exercises 8. Power yoga 9. Yoga relaxation 10. Final assessment Students can engage in different sport activities offered by the sea resort – swimming, rafting, volleyball, football, table tennis, tennis and other water sports in particular.	
<b>Recommended literature:</b> 1. BUZKOVÁ, K. 2006. Fitness jóga. Praha: Grada. 167 s.	

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

**Course language:**

Slovak language

**Notes:**

**Course assessment**

Total number of assessed students: 54

abs	n
11.11	88.89

**Provides:** Mgr. Agata Dorota Horbacz, PhD.

**Date of last modification:** 29.03.2022

**Approved:**



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚBEV/ SFR/04		<b>Course name:</b> Seminar from Plant Physiology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 2					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> Literature search training, interpretation of actual news in plant physiology, ability to present scientific results. Increase of ability to constructively discuss scientific topics. Processing and analysis of results using statistical programs. Preparation of posters and presentations. Requirements for diploma theses.					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 30					
A	B	C	D	E	FX
83.33	16.67	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Michaela Bačovčinová, PhD.					
<b>Date of last modification:</b> 26.10.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice		
<b>Faculty:</b> Faculty of Science		
<b>Course ID:</b> KPPaPZ/SPVKE/07	<b>Course name:</b> Social-Psychological Training of Coping with Critical Life Situations	
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present		
<b>Number of ECTS credits:</b> 2		
<b>Recommended semester/trimester of the course:</b> 2.		
<b>Course level:</b> II.		
<b>Prerequisites:</b>		
<b>Conditions for course completion:</b>		
<b>Learning outcomes:</b>		
<b>Brief outline of the course:</b>		
<b>Recommended literature:</b>		
<b>Course language:</b>		
<b>Notes:</b>		
<b>Course assessment</b> Total number of assessed students: 126		
abs	n	z
97.62	2.38	0.0
<b>Provides:</b> Mgr. Ondrej Kalina, PhD.		
<b>Date of last modification:</b> 24.06.2022		
<b>Approved:</b>		

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ TVa/11	<b>Course name:</b> Sports Activities I.
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> I., I.II., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Min. 80% of active participation in classes.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> Brief outline of the course: Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
<b>Recommended literature:</b> BENCE, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: <a href="https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571">https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</a> 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: 14548

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
86.46	0.07	0.0	0.0	0.0	0.05	8.41	5.02

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

**Date of last modification:** 29.03.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ TVb/11	<b>Course name:</b> Sports Activities II.
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> I., I.II., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> active participation in classes - min. 80%.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
<b>Recommended literature:</b> BENEC, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: <a href="https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571">https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</a> 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: 13211

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
84.35	0.51	0.02	0.0	0.0	0.05	10.78	4.29

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

**Date of last modification:** 29.03.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ TVc/11	<b>Course name:</b> Sports Activities III.
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> I., I.II., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> min. 80% of active participation in classes	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
<b>Recommended literature:</b> BENEC, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: <a href="https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571">https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</a> 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:Trénink 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: 8879

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.62	0.07	0.01	0.0	0.0	0.02	4.25	7.03

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

**Date of last modification:** 29.03.2022

**Approved:**



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ TVd/11	<b>Course name:</b> Sports Activities IV.
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 4.	
<b>Course level:</b> I., I.II., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> min. 80% of active participation in classes	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
<b>Recommended literature:</b> BENEC, M. et al. 2005. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. [online] Dostupné na: <a href="https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571">https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</a> 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: 5628

abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
82.66	0.28	0.04	0.0	0.0	0.0	8.05	8.97

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

**Date of last modification:** 29.03.2022

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ SVK/01	<b>Course name:</b> Student Scientific Conference
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 20	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b> 30.11.2021	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ LKSp/13	<b>Course name:</b> Summer Course-Rafting of TISA River
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> 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	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 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	
<b>Recommended literature:</b> 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: <a href="https://ulozto.sk/tamhle/UkyxQ2lYF8qh/name/Nahrane-7-5-2021-v-14-46-39#!ZGDjBGR2AQtkAzVkAzLkLJWuLwWxZ2ukBRLjnGqSomICMmOyZN==">https://ulozto.sk/tamhle/UkyxQ2lYF8qh/name/Nahrane-7-5-2021-v-14-46-39#!ZGDjBGR2AQtkAzVkAzLkLJWuLwWxZ2ukBRLjnGqSomICMmOyZN==</a>	
<b>Course language:</b> Slovak language	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 209	
abs	n
37.32	62.68
<b>Provides:</b> Mgr. Dávid Kaško, PhD.	
<b>Date of last modification:</b> 29.03.2022	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚBEV/ ZOG1/03	<b>Course name:</b> Zoogeography
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Active participation in seminars. Preparation of oral presentation to a selected topic. Completion of two semestral written examinations. Oral examination.	
<b>Learning outcomes:</b> 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.	
<b>Brief outline of the course:</b> 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).	
<b>Recommended literature:</b> 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	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 989					
A	B	C	D	E	FX
24.47	23.56	23.56	18.91	7.79	1.72
<b>Provides:</b> prof. RNDr. Ľubomír Kováč, CSc.					
<b>Date of last modification:</b> 10.12.2021					
<b>Approved:</b>					