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University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of Science					
<b>Course ID:</b> CJP/ PFAJAKA/07	Course name: Academic English				
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 28 esent				
Number of ECTS cr	edits: 2				
Recommended seme	ster/trimester of the course:				
Course level: I.					
Prerequisities:					
<b>Conditions for cours</b> Active classroom par 1 test (13th week), no Presentation on chose Final evaluation- ave Grading scale: A 93-	ticipation, assignments handed in on time, 2 absences tolerated o retake. en topic rage assessment of test (50%), and presentation (50%). 100%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less				
Learning outcomes: The development of so of their linguistic cor syntactic aspects, dev for a given purpose, v	students' language skills - reading, writing, listening, speaking, improvement npetence - students acquire knowledge of selected phonological, lexical and relopment of pragmatic competence - students can effectively use the language with focus on Academic English, level B2.				
<b>Brief outline of the c</b> Formal and informal Academic English an Key academic verbs a Linking words in aca Word-formation - aff abstract Selected aspects of E Selected functional a paraphrasing	ourse: English Id its specific features and nouns demic writing, writing a paragraph, word-order, topic sentences ixation nglish pronunciation, academic vocabulary grammar structures - defining, classifying, epressing opinion, cause-effect,				
Recommended litera Seal B.: Academic En T. Armer :Cambridge M. McCarthy M., O' Zemach, D.E, Rumis Olsen, A. : Active Vo www.bbclearningeng Cambridge Academic	ncounters, CUP, 2002 English for Scientists, CUP 2011 Dell F Academic Vocabulary in Use, CUP 2008 ek, L.A: Academic Writing, Macmillan 2005 ocabulary, Pearson, 2013 lish.com c Content Dictionary, CUP, 2009				

Course language: English language, level B2 according to CEFR.							
Notes:	Notes:						
Course assessment Total number of assessed students: 435							
А	В	С	D	Е	FX		
36.09	22.3	14.94	9.89	5.75	11.03		
Provides: Mgr.	Viktória Mária S	lovenská		•			
Date of last modification: 11.09.2024							
Approved: pro	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Pl	1D.		

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	Science
<b>Course ID:</b> ÚINF/ ASU1/15	Course name: Algorithms and data structures
Course type, scope a Course type: Lectu Recommended cou Per week: 2 / 1 Per Course method: pro	and the method: re / Practice rse-load (hours): study period: 28 / 14 esent
Number of ECTS cr	redits: 4
Recommended seme	ester/trimester of the course: 4.
Course level: I., N	
Prerequisities: ÚINF	F/PAZ1a/15 and ÚINF/PAZ1b/15
<b>Conditions for cours</b> Practice activities, he Final examination co	se completion: omeworks and midterm exam. onsisting of practice and theoretical test.
<b>Learning outcomes:</b> Understand and learn algorithms.	algorithmic paradigms and data structures. Analyse time complexity of these
Brief outline of the of Algorithms' time and Brute Force. Backtr comparison sort algo Data structures – que union & find, trie.	course: d space asymptotic complexity. Main Theorem. Amortized complexity. rack. Divide and Conquer. Dynamic programming. Comparison and non- orithms. Sweep line algorithms. Graph Theory Algorithms. eue, stack, priority queue, heap, prefix sum, binary search trees, interval trees,
Recommended litera 1, Laaksonen A.: Gu Through Contests (U 978-3319725468 2, Forišek M., Steino Computer Science, S 3, R. Sedgewick, K. 978-0321573513, htt 4, Open Data Structu	ature: ide to Competitive Programming: Learning and Improving Algorithms Undergraduate Topics in Computer Science), Springer, 2017, ISBN ová M.: Explaining Algorithms Using Metaphors. Springer Briefs in Springer (2013), ISBN 978-1-4471-5018-3 Wayne: Algorithms (4th Edition), Addison-Wesley Professional, 2011, ISBN tp://algs4.cs.princeton.edu/home/ irres: http://opendatastructures.org/
Course language: Slovak or english	
Notes: Content prerequisitie - programming skills - mathematics: computing with po computing limits o	es: s in some programming language (Python/Java/C++/) olynomials, logarithmic and exponential functions of sequences, L'Hospital rule

Course assessment Total number of assessed students: 209								
A B C D E FX								
12.44	5.74	18.18	26.32	34.45	2.87			
Provides: RNDr. Rastislav Krivoš-Belluš, PhD.								
Date of last modification: 08.01.2022								
Approved: prot	f. RNDr. Vladimí	Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J	University: P. J. Šafárik University in Košice							
Faculty: Facult	y of Science							
Course ID: KP ALP/06	Course ID: KPE/ Course name: Alternative Education ALP/06							
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present								
Number of EC	TS credits: 2							
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4.					
Course level: I.								
Prerequisities:								
Conditions for	course completi	ion:						
Learning outco	omes:							
Brief outline of	the course:							
Recommended	literature:							
Course languag	ge:							
Notes:								
Course assessment Total number of assessed students: 362								
A B C D E FX								
67.68	67.68 25.14 4.14 0.55 0.28 2.21							
Provides: Mgr. Zuzana Vagaská, PhD.								
Date of last modification: 12.03.2024								
Approved: prof	Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.							

University: P. J.	Šafárik Univer	sity in Košice				
Faculty: Faculty of Science						
Course ID: ÚCHV/ Course name: Analytical Chemistry ANCHU/21						
Course type, sc Course type: I Recommended Per week: 3 / 1 Course metho	ope and the me Lecture / Practic d course-load (l Per study per d: present	thod: e nours): iod: 42 / 14				
Number of EC	<b>FS credits:</b> 5					
Recommended	semester/trime	ster of the cours	e: 3.			
Course level: I.						
Prerequisities:						
Conditions for 1. 3x test of ana 2. Examination	course complet lytical calculati is composed of	ion: ons (each 33%, m 3 questions (each	inim. 50%). for 33%, it is no	ecessary to reach	at least 50%).	
Learning outco Survey of basic in research and	mes: principles and t practice.	asks of analytical	chemistry and a	applications of ana	alytical methods	
<ul> <li>Brief outline of the course:</li> <li>Subject and role of analytical chemistry. General principles and procedures - sampling, sample pre- treatment. Preparation of solutions. Evaluation of the results.</li> <li>Classification of analytical reactions. Qualitative analysis of cations and anions. Basic principles of organic analysis.</li> <li>Methods of quantitative analysis. General principles of gravimetry. Volumetric analysis.</li> <li>Instrumental methods of analytical chemistry (basic principles, instrumentaion and applications) - electroanalytical optical and separation methods.</li> </ul>						
<b>Recommended</b> D.Harvey, Mod Skoog D.A., Pr	literature: ern Analytical ( inciples of Instr	Chemistry. McGra umental Analysis.	w Hill, Boston, Saunders Col. 1	2000 Publishing, New Y	York 1985	
Course languag	ge:					
Notes:						
Course assessment Total number of assessed students: 101						
А	В	С	D	Е	FX	
30.69	17.82	20.79	19.8	6.93	3.96	
Provides: doc. 1	RNDr. Taťána G	ondová, CSc.				
Date of last modification: 12.11.2021						
Approved: prof	. RNDr. Vladim	ír Zeleňák, DrSc.	, prof. RNDr. St	anislav Krajči, Ph	ıD	

University: P. J. Ša	fárik University in Kos	šice
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Faculty: Faculty of Science

Course ID: ÚINF/	Course name: Automata and formal languages
AFJ1a/15	

**Course type, scope and the method: Course type:** Lecture / Practice

**Recommended course-load (hours): Per week:** 2 / 1 **Per study period:** 28 / 14

Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 4.

Course level: I., N

Prerequisities:

**Conditions for course completion:** 

Oral examination.

#### Learning outcomes:

To provide theoretical background for studying computer science in general, by giving the necessary knowledge in theory of automata.

#### **Brief outline of the course:**

1: Chomsky hierarchy of grammars: alphabet, symbol (letter, character), transitive closure, word (string), empty word (empty string), length of a string, concatenation, language, grammar, nonterminal symbol, terminal symbol, initial nonterminal (initial symbol), grammar rule, derivation step, language generated by a grammar, Chomsky hierarchy of grammars - phrase-structure, context sensitive, context free, regular

2: Deterministic finite state automata: finite state automaton, state, input symbol, output symbol, initial state, transition function, output function, examples of automata and their graphic representation, generalized transition and output functions and their basic properties

3: Reduction of automata I: equivalent automata, minimal (optimal) automaton, reachable state, properties of reachable states, elimination of unreachable states

4: Reduction of automata II: equivalent states, k-equivalent states, properties of equivalence and kequivalence, relation between k-equivalence and (k+1)-equivalence, partitioning the state set into equivalence classes, elimination of equivalent states

5: Reduction of automata III: proof of correctness, unambiguity, and optimality of reduced automaton, testing equivalence of two automata

6: Deterministic finite state acceptors: basic definitions, language recognized by a finite state acceptor, common properties of acceptors and automata with an output, minimizing a finite state acceptor

7: Operations with regular languages: complement, intersection, union, difference, symmetric difference, testing of emptiness, inclusion, equality, and disjointness for regular languages

8: Nondeterministic finite state acceptors: definition, transition function, language recognized by a nondeterministic acceptor, elimination of nondeterminism

9: epsilon-acceptors: definition, properties, elimination of epsilon-transitions

10: Regular grammars: regular grammar, extended regular grammar, transformation of acceptor to a regular grammar, transformation of extended regular grammar to an epsilon-acceptor

11: Regular expressions I: basic properties, transformation of regular expression to an epsilonacceptor

12: Regular expressions II: regular equations, valid algebraic manipulations with regular expressions, solving an equation with a single unknown variable, solving a system of regular equations, transformation of acceptor to a regular expression

13: Another constructions: review of transformations among various representations, an example of a direct transformation of a grammar to a regular expression, closure of the class of regular languages under another language operations – concatenation and Kleene star, mirror image

14: Another operations: homomorphism and inverse homomorphism, a context-free language that is not regular

### **Recommended literature:**

J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2001.

J. Shallit: A second course in formal languages and automata theory, Cambridge University press, 2009.

M. Sipser: Introduction to the theory of computation, Thomson Course Technology, 2006.

## **Course language:**

Slovak or English

### Notes:

### **Course assessment**

Total number of assessed students: 928

А	В	С	D	Е	FX
27.16	18.32	23.6	16.49	9.7	4.74

Provides: prof. RNDr. Viliam Geffert, DrSc., RNDr. Juraj Šebej, PhD.

Date of last modification: 23.11.2021

University: P. J. Safári	k University in Košice			
Faculty: Faculty of Science				
Course ID: ÚINF/ C AFJ1b/15	Course name: Automata and formal languages			
Course type, scope and Course type: Lecture Recommended cours Per week: 2 / 1 Per st Course method: prese	d the method: / Practice e-load (hours): tudy period: 28 / 14 ent			
Number of ECTS cred	lits: 5			
<b>Recommended semest</b>	er/trimester of the course: 5.			
Course level: I.				
Prerequisities: ÚINF/A	AFJ1a/15			
<b>Conditions for course</b> Test and oral examinat	<b>completion:</b> ion.			
Learning outcomes: To provide theoretical b knowledge in theory of	background for studying computer science in general, by giving the necessary f automata.			
<ul> <li>Brief outline of the contact of the conta</li></ul>	urse: :: definition of a pushdown automaton, accepting by final states, accepting own automata: examples of application in practice ars: basic definition, leftmost derivation, derivation tree, elimination of rules 1 A→B, Chomsky normal form ontext-free grammars and pushdown automata: transforming context-free n automaton, transforming pushdown automaton to a context-free grammar Statement of the lemma and its proof applications of the lemma f context-free languages f deterministic context-free languages a producing an output: basic definitions and properties, applications in languages: context-sensitive grammar, nondeterministic linear-bounded b, transforming context-sensitive grammar to an LBA, transforming LBA to mmar of context-sensitive languages merable languages: phrase-structure grammar, nondeterministic and achine, transforming nondeterministic Turing machine to a phrase-structure g phrase-structure grammar to a deterministic Turing machine, closure hachine decidable problems of the formal language theory ure:			

1. J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2001.

2. J. Shallit: A second course in formal languages and automata theory, Cambridge University press, 2009.

3. M. Sipser: Introduction to the theory of computation, Thomson Course Technology, 2006.

## Course language:

Slovak or English

## Notes:

Content prerequisities:

 Basic mathematical background (proof by contradicion and by mathematical induction), basic notions from the set theory (union, intersection, complement, cartesian product).
 Basic knowledge about finite state automata and regular languages.

### **Course assessment**

Total number of assessed students: 616

А	В	С	D	Е	FX
38.15	17.05	19.81	16.56	6.01	2.44

Provides: prof. RNDr. Viliam Geffert, DrSc., RNDr. Juraj Šebej, PhD.

**Date of last modification:** 23.11.2021

University: P. J. Šafá	rik University in Košice	
Faculty: Faculty of S	cience	
<b>Course ID:</b> ÚINF/ BKP/14	Course name: Bachelor Pr	oject
Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	nd the method: rse-load (hours): ly period: esent	
Number of ECTS cr	edits: 2	
Recommended seme	ster/trimester of the cours	
Course level: 1.		
Prerequisities:		
Conditions for cours	e completion:	
Learning outcomes:		
Brief outline of the c	ourse:	
Recommended litera	iture:	
Course language:		
Notes:		
Course assessment Total number of asses	ssed students: 7	
	abs	n
	100.0	0.0
Provides:		
Date of last modifica	tion:	
Approved: prof. RNI	Dr. Vladimír Zeleňák, DrSc.	, prof. RNDr. Stanislav Krajči, PhD.

University: P. J. Šafarik University in Košice Faculty: Faculty of Science Course ID: ÚINF/ Course name: Bachclor Thesis and its Defence BPO/14 Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course intervention of ECTS credits: 4 Recommended semester/trimester of the course: Course level: 1. Prerequisities: Conditions for course completion: The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Safarik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action. Learning outcomes: The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study Regulations of UPJŠ in Košice for the 1st, 2nd and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree. Brief outline of the course: 1. Elaboration of the bashelor thesis in accordance with the discussion. 2. Presentation of the course: 1. Elaboration of the bashelor thesis in accordance with the discussion. 3. Answering questions related to the topic of the bachelor thesis within the discussion. 3. Answering questions related to the topic of the bachelor thesis within the discussion. 3. Answering questions related to the topic of the bachelor thesis and the topic of the bachelor thesis. Course language: Slovak and optionally English. Notes:		
Faculty: Faculty of Science         Course ID: ÚINF/ BPO/14       Course name: Bachelor Thesis and its Defence BPO/14         Course type; scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present         Number of ECTS credits: 4         Recommended semester/trimester of the course:         Course level: I.         Prerequisities:         Conditions for course completion:         The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Safärik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:       The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content i, formal and combined 1st and 2nd degree.         Brief outline of the course:       1. Elaboration of the scale of the study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree.         Brief outline of the bachelor thesis in accordance	University: P. J. Šafá	rik University in Košice
Course ID: ÚINF/ BPO/14       Course name: Bachelor Thesis and its Defence BPO/14         Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present         Number of ECTS credits: 4         Recommended semester/trimester of the course: Course level: 1.         Prerequisities:         Conditions for course completion: The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Safařik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:         The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content, formal and combined 1st and 2nd degree.         Brief outline of the course: 1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor. 2, Presentation of the bachelor thesis in accordance with the instructions of the supervisor. 2, Presentation of the trasture is determined individually in accordance with the topic of the bachelor's thesis. <td< td=""><td>Faculty: Faculty of S</td><th>cience</th></td<>	Faculty: Faculty of S	cience
Course type, scope and the method:       Course type:         Recommended course-load (hours):       Per weck: Per study period:         Course method: present	<b>Course ID:</b> ÚINF/ BPO/14	Course name: Bachelor Thesis and its Defence
Number of ECTS credits: 4         Recommended semester/trimester of the course:         Course level: I.         Prerequisities:         Conditions for course completion:         The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Safárik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:       The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree.         Brief outline of the course:         1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.         2. Presentation of the results of the bachelor's thesis before the examination commission.         3. Answering questions related to the topic of the bachelor thesis within the discussion.         Recommended literature:         The recon	Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	nd the method: rse-load (hours): ly period: esent
Recommended semester/trimester of the course:         Course level: I.         Prerequisities:         Conditions for course completion:         The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Šafărik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:       The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJS in Košice for the 1st, 2nd and combined 1st and 2nd degree.         Brief outline of the course:         1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.         2. Presentation of the bachelor thesis in accordance with the discussion.         3. Answering questions related to the topic of the bachelor thesis within the discussion.         3. Answering questions related to the topic of th	Number of ECTS cr	edits: 4
Course level: 1.         Prerequisities:         Conditions for course completion:         The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Šafārik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:       The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree.         Brief outline of the course:         1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.         2, Presentation of the bachelor's thesis before the examination commission.         3. Answering questions related to the topic of the bachelor thesis within the discussion.         Recommended literature is determined individually in accordance with the topic of the bachelor's thesis.         Course language:         Slovak and optionally English. </td <td>Recommended seme</td> <th>ster/trimester of the course:</th>	Recommended seme	ster/trimester of the course:
Prerequisities:         Conditions for course completion:         The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Šafárik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.         Learning outcomes:       The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJS in Košice for the 1st, 2nd and combined 1st and 2nd degree.         Brief outline of the course:         1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.         2. Presentation of the results of the bachelor's thesis before the examination commission.         3. Answering questions related to the topic of the bachelor thesis within the discussion.         Recommended literature:         The recommended literature is determined individually in accordance with the topic of the bachelor's thes	Course level: I.	
<ul> <li>Conditions for course completion:</li> <li>The bachelor thesis is the result of the student's own work. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Šafárik University in Košice and its components. Fulfillment of the criteria is verified mainly in the supervision process and in the process of thesis defense. Failure to do so is reason for disciplinary action.</li> <li>Learning outcomes:</li> <li>The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree.</li> <li>Brief outline of the course: <ul> <li>1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.</li> <li>2, Presentation of the results of the bachelor's thesis before the examination commission.</li> <li>3. Answering questions related to the topic of the bachelor thesis within the discussion.</li> </ul> </li> <li>Recommended literature: <ul> <li>The recommended literature is determined individually in accordance with the topic of the bachelor's thesis.</li> </ul> </li> <li>Course language: <ul> <li>Slovak and optionally English.</li> </ul> </li> </ul>	Prerequisities:	
Learning outcomes: The bachelor's thesis demonstrates mastery of the basics of theory and professional terminology of the field of study, acquisition of knowledge, skills and competencies in accordance with the declared profile of the graduate of the study program, as well as the ability to apply them creatively in solving selected field problems. The bachelor thesis may have elements of compilation. The student demonstrates the ability of independent professional work in terms of content, formal and ethical. Further details on the bachelor thesis are determined by Directive no. 1/2011 on the basic requirements of final theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and combined 1st and 2nd degree. Brief outline of the course: 1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor. 2, Presentation of the results of the bachelor's thesis before the examination commission. 3. Answering questions related to the topic of the bachelor thesis within the discussion. Recommended literature: The recommended literature is determined individually in accordance with the topic of the bachelor's thesis. Course language: Slovak and optionally English. Notes:	The bachelor thesis is fraud and must meet 21/2021, which lays Košice and its compo and in the process of	s the result of the student's own work. It must not show elements of academic the criteria of good research practice defined in the Rector's Decision no. down the rules for assessing plagiarism at Pavol Jozef Šafárik University in onents. Fulfillment of the criteria is verified mainly in the supervision process thesis defense. Failure to do so is reason for disciplinary action.
Brief outline of the course:         1. Elaboration of the bachelor thesis in accordance with the instructions of the supervisor.         2, Presentation of the results of the bachelor's thesis before the examination commission.         3. Answering questions related to the topic of the bachelor thesis within the discussion.         Recommended literature:         The recommended literature is determined individually in accordance with the topic of the bachelor's thesis.         Course language:         Slovak and optionally English.         Notes:	Learning outcomes: The bachelor's thesis of the field of study, declared profile of the in solving selected fi student demonstrates ethical. Further detail requirements of final combined 1st and 2nd	demonstrates mastery of the basics of theory and professional terminology acquisition of knowledge, skills and competencies in accordance with the e graduate of the study program, as well as the ability to apply them creatively ield problems. The bachelor thesis may have elements of compilation. The the ability of independent professional work in terms of content, formal and ls on the bachelor thesis are determined by Directive no. 1/2011 on the basic l theses and the Study Regulations of UPJŠ in Košice for the 1st, 2nd and d degree.
Recommended literature:         The recommended literature is determined individually in accordance with the topic of the bachelor's thesis.         Course language:         Slovak and optionally English.         Notes:	<b>Brief outline of the c</b> 1. Elaboration of the 2, Presentation of the 3. Answering question	ourse: bachelor thesis in accordance with the instructions of the supervisor. results of the bachelor's thesis before the examination commission. ns related to the topic of the bachelor thesis within the discussion.
Course language: Slovak and optionally English. Notes:	<b>Recommended litera</b> The recommended literation bachelor's thesis.	erature is determined individually in accordance with the topic of the
Notes:	<b>Course language:</b> Slovak and optionally	y English.
	Notes:	

Course assessment Total number of assessed students: 153						
ABCDEFX						
44.44	26.8	14.38	7.84	6.54	0.0	
Provides:						
Date of last modification: 28.11.2021						
Approved: prot	Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					

University: P. J	. Šafárik Univer	sity in Košice			
Faculty: Facult	y of Science				
Course ID: ÚC BPO/21	HV/ Course n	ame: Bachelor T	hesis and its De	fence	
Course type, so Course type: Recommended Per week: Per Course metho	cope and the me d course-load (I r study period: d: present	thod: nours):			
Number of EC	TS credits: 4				
Recommended	semester/trime	ster of the cours	e:		
Course level: I.					
Prerequisities:					
Conditions for	course complet	ion:			
Learning outco	omes:				
Brief outline of Oral presentation the state examine	the course: on of the thesis anation board.	results. Answerin	g questions of t	he thesis oponen	t or members of
Recommended	literature:				
<b>Course langua</b> slovak	ge:				
Notes:					
Course assessm Total number o	nent f assessed studer	nts: 27			
A	В	C	D	E	FX
88.89	11.11	0.0	0.0	0.0	0.0
Provides:		•	L		
Date of last mo	dification: 07.1	2.2021			
Approved: prof	f. RNDr. Vladim	ír Zeleňák, DrSc.	, prof. RNDr. St	tanislav Krajči, Pl	nD.

University. D I Čefé	rik University in Va	Šice
University. F. J. Sala		
<b>Faculty:</b> Faculty of S	cience	
<b>Course ID:</b> ÚCHV/ BKPa/22	Course name: Baka	alársky projekt I
Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	nd the method: rse-load (hours): y period: esent	
Number of EC15 cr		
Recommended seme	ster/trimester of the	e course: 5.
Course level: I.		
Prerequisities:		
Conditions for cours	e completion:	
Learning outcomes:		
Brief outline of the c	ourse:	
Recommended litera	iture:	
Course language:		
Notes:		
Course assessment Total number of asse	ssed students: 33	
	abs	n
	100.0	0.0
Provides:		•
Date of last modifica	tion: 07.02.2022	
Approved: prof. RNI	Dr. Vladimír Zeleňák	, DrSc., prof. RNDr. Stanislav Krajči, PhD.

University: P. J. Šafá	rik University in Ko	šice		
Faculty: Faculty of S	cience			
Course ID: ÚCHV/ BKPb/22	Course name: Bak	alársky projekt II		
Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	nd the method: rse-load (hours): y period: esent			
Number of ECIS cr	edits: 3			
Recommended seme	ster/trimester of th	e course: 6.		
Course level: I.				
Prerequisities:				
Conditions for cours	e completion:			
Learning outcomes:				
Brief outline of the c	ourse:			
Recommended litera	ture:			
Course language:				
Notes:				
Course assessment Total number of asses	ssed students: 26			
	abs		n	
	100.0		0.0	
Provides:		ľ		
Date of last modifica	tion: 07.02.2022			
Approved: prof. RNI	Dr. Vladimír Zeleňák	, DrSc., prof. RNDr. S	tanislav Krajči, PhD.	

Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Basis of Mineralogy
MIN1/14	

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 2 / 1 Per study period: 28 / 14

Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: I.

**Prerequisities:** ÚCHV/VCH/10 or ÚCHV/VCH/21 or ÚCHV/VCHU/10 or ÚCHV/ZAC2/10 or ÚCHV/VACH/10 or ÚCHV/CHG/09 or ÚCHV/ZCF/03 or ÚCHV/VCHU/15

#### **Conditions for course completion:**

Verification of theoretical knowledge and recognizing minerals.

A semester project about selected minerals (40 %), a practical test from recognizing of minerals (30 %), a written examination (30 %). The student must obtain totally at least 51%.

In a case of online education the practical test is canceled and the written examination contains more questions (60 %).

#### Learning outcomes:

To recognize the beauty of nature and to obtain basic knowledge from mineralogy. After completing the course, students will be familiar with the properties of commonly available minerals and will be able to recognize these minerals.

#### **Brief outline of the course:**

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

#### **Recommended literature:**

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

### **Course language:**

Slovak

#### Notes:

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

Course assessment Total number of assessed students: 149						
A B C D E FX						
81.88	16.11 0.67 0.67 0.0 0.67					
Provides: doc. RNDr. Ivan Potočňák, PhD.						
Date of last modification: 21.07.2022						
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Ph	ıD.	

<b>University:</b> P. J. Šafárik	University	/ in	Košice
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Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Biochemistry
BCHU/21	

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

Number of ECTS credits: 5

**Recommended semester/trimester of the course:** 5.

Course level: I.

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

#### **Conditions for course completion:**

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

#### Learning outcomes:

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

#### Brief outline of the course:

1. Protein Structure and Function, Exploring proteins.

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

#### **Recommended literature:**

#### **Course language:**

Notes:

Course assessment Total number of assessed students: 106								
A B C D E FX								
29.25	29.25 13.21 13.21 18.87 19.81 5.66							
<b>Provides:</b> prof. RNDr. Erik Sedlák, DrSc., RNDr. Nataša Tomášková, PhD., prof. RNDr. Mária Kožurková, CSc., Mgr. Mária Tomková, PhD.								
Date of last modification: 14.11.2021								
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.								

University. r. J.	Šafárik Univers	ity in Košice						
Faculty: Faculty	of Science							
Course ID: ÚCHV/ BCH1b/10Course name: Biochemistry II								
Course type, sco Course type: L Recommended Per week: 3 / 1 Course method	ope and the met becture / Practice l course-load (h Per study peri d: present	thod: c ours): od: 42 / 14						
Number of EC7	<b>S credits:</b> 5							
Recommended	semester/trimes	ster of the cours	<b>e:</b> 6.					
Course level: I.								
Prerequisities: 1	ÚCHV/BCH1a/(	3 or ÚCHV/BC	HU/21 or ÚCHV	/BCH1a/21				
<b>Conditions for </b> Test and oral ex	<b>course completi</b> amination.	on:						
The aim of bioc basis of their mo	hemistry teachin blecular structure	ng is to acquire k e information on	nowledge in the cell metabolism	field of living o	rganisms on the			
Basic principle (	of metabolism, ba	asic metabolic pa	thways and cycle	es, integration of	cell metabolism.			
Recommended Koolman J., Roo Kodíček M., Va škola chemicko-	literature: ehm K.H.: Color lentová O., Hyno technologická v	atlas of biochen ek R.: Biochemie Praze, Praha, 20	nistry. Thieme, S e, chemický pohl )22.	tuttgart, German ed na biologický	y, 2005. svět, Vysoká			
Course languag	e:							
Course assessm	ent	ts: 397						
Iotal number of assessed students: 39/       A     B       C     D       E     EV								
A	В	9 82 19 14 31 49 17 63 20 91 1 01						
A 9.82	В 19.14	31.49	17.63	20.91	FX 1.01			
A 9.82 Provides: prof. I Rastislav Varhač RNDr. Danica Sa	B 19.14 RNDr. Mária Ko , PhD., doc. RN abolová, PhD., u	31.49 žurková, CSc., p Dr. Viktor Víglas miverzitná docen	17.63 rof. RNDr. Erik ský, PhD., RNDi tka	20.91 Sedlák, DrSc., do : Nataša Tomášk	FX 1.01 oc. RNDr. ová, PhD.,			

University	Р	ТŠ	Šafárik	Univer	sity	in	Košice
University.	1.	J. K	Jararik	Univers	sity	III .	RUSICC

Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Biochemistry Practical
PBCHU/15	

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

Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚCHV/BCHU/03 or ÚCHV/BCHU/21

#### **Conditions for course completion:**

Active participation with a maximum of one excused absence without the need for compensation. In case of excused absence from two or more practical exercises (e.g. due to illness), the student agrees with the teacher on alternative dates for practice.

Correctly prepared protocols from all completed tasks.

At least 51% of points from each of the written tests.

#### Learning outcomes:

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

#### Brief outline of the course:

1. Biochemistry laboratory safety rules. Basic biochemical laboratory procedures.

- 2. Qualitative tests for amino acids and proteins.
- 3. Isolation of casein from milk. Determination of protein concentration by Lowry method.

4. Determination of the iodine number by Yasud method . Soap production. Reactions with soap. Oxidation of unsaturated fatty acids.

5. Saponification number of fats and oils. Qualitative test for cholesterol: Salkowsky reaction.

6. Qualitative tests for carbohydrates. Determination of reducing carbohydrates by the Schoorl's method.

7. Determination of reducing and nonreducing carbohydrates in germinant plants.

8. Time-dependent course of enzyme-catalyzed reaction: digestion of gelatin by trypsine.

9. Determination of catalase activity and the first order rate constant. Effect of pH on alpha-amylase activity.

10. Effect of substrate concentration on initial rate of reaction, determination of Km and Vmax for urease-catalyzed hydrolysis of urea.

11. Isolation of DNA from spleen. Isolation of RNA from yeast. Qualitative tests for DNA and RNA components.

12. Determination of vitamin C concentration by 2,4-dinitrofenylhydrazine. Determination of vitamins A, B1, and C.

13. Final evaluation of students.

### **Recommended literature:**

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

### **Course language:**

Slovak

### Notes:

Teaching is carried out in person.

### **Course assessment**

Total number of assessed students: 260

А	В	С	D	Е	FX
78.85	17.31	2.69	0.77	0.38	0.0

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

## Date of last modification: 19.11.2021

<b>University:</b> P. J	. Šafárik Univers	ity in Košice						
Faculty: Facult	y of Science							
<b>Course ID:</b> ÚC BAC1/04	Course ID: ÚCHV/ Course name: Bioinorganic Chemistry I BAC1/04							
Course type, sc Course type: 1 Recommended Per week: 2 / 1 Course metho	ope and the me Lecture / Practice d course-load (h l Per study peri d: present	thod: c ours): od: 28 / 14						
Number of EC	<b>FS credits:</b> 5							
Recommended	semester/trime	ster of the cours	<b>e:</b> 5.					
Course level: I.	, II.							
Prerequisities:								
<b>Conditions for</b> Test or seminar examination	<b>course complet</b> works	on:						
Learning outco The basic know biocatalysis, mo metals in the en	o <b>mes:</b> vledges about bio etals in biology a vvironment.	ometal interaction and medicine, me	ns with biomolec etal-based drugs,	cules, biomateria toxic metals for	ls, biominerals, biosystems and			
Brief outline of Metalic and non elements, esser Oxygen carrier processes. Calc bioinorganic ch radiodiagnostic	the course: n-metalic elemential trace elemential trace elemential trace elemential substantial trace elemential substantial trace elemential substantial trace elemential trace	ts and their roles nents). Biocoord nsport proteins. and biomineraliz nacy, chemothera hnology, ecology	in biological sys ination compou Photochemical p ration.Toxic meta apy (e.g. platinum and in other bra	tems (biometals, nds, bioligands. rocess. Catalysis als. Application of m complexes in nches of life.	bulk biological Biocatalyzers. and regulation of knowledge of cancer therapy)			
Recommended 1. Shriver D. F. Atkins. Inorgan 2. Kaim W., Sch Life. Wiley, Ch 3. Wilkins P. C.	<b>literature:</b> , Atkins P. W., O ic Chemistry. Oz hwederski B.: Bi ichester 1998. , Wilkins R. G.:	verton T. L., Rou ford University I oinorganic Chem Inorganic Chemi	rke J.P., Weller M Press, Oxford 20 histry: Inorganic I stry in Biology. (	M.T., Amstrong I 06. Elements in the C DCP, Oxford 199	F.A.: Shiver & Chemistry of 7.			
Course languag	ge:							
Notes:	_							
Course assessm	ient							
Total number of	f assessed studer	its: 386	5					
A	В	C	D	E	FX			
41.71	27.72	19.17	5.96	5.18	0.26			
Provides: prof.	RNDr. Zuzana V	/argová, Ph.D.						

Date of last modification: 28.10.2021

University: P. J. Š	afárik Univers	ity in Košice				
Faculty: Faculty of	of Science					
<b>Course ID:</b> ÚBEV BDD/05	V/ Course na	me: Biology of (	Children and Ac	lolescents		
Course type, scop Course type: Lea Recommended o Per week: 2 / 0 I Course method:	be and the met cture / Practice course-load (he Per study period present	hod: ours): od: 28 / 0				
Number of ECTS	S credits: 2					
Recommended se	emester/trimes	ter of the cours	e: 4., 6.			
Course level: I.						
Prerequisities:						
<b>Conditions for co</b> Written test	urse completi	on:				
Learning outcom Acquisition of ba systems of the hur with development of ontogenesis.	es: asic morpholog man body with al and growth	gical and physio a focus on the sp characteristics an	logical knowled ecifics of childh d with the most	lge about individ lood and adolesce common diseases	lual organs and nce. Familiarity s in these stages	
Brief outline of th Human ontogene circulatory, respin system. Nervous population and en	ne course: sis. Postnatal ratory, gastroir system. Age s wironment.	development. A ntestinal and urin pecifics of select	ge specific fea nary systems. I ted diseases and	tures of skeletal Reproductive sys d drug dependenc	and muscalar, tem. Endocrine e arise. Human	
Recommended lif Drobný I., Drobna 2000 Lipková V.: Soma Malá H., Klement	t <b>erature:</b> á M.: Biológia utický a fyziolo ta J.: Biológia o	dieťaťa pre špeci gický vývoj dieť letí a dorastu. Br	álnych pedagóg aťa. Osveta Bra atislava, SPN, 1	gov I. a II. Bratisla tislava, 1980 989	ava, PdF UK,	
Course language:	;					
Notes:						
Course assessment Total number of assessed students: 1795						
A	В	С	D	Е	FX	
31.36	23.96	18.27	16.66	9.14	0.61	
Provides: doc. RN	IDr. Monika K	assayová, CSc.		1		
Date of last modi	fication: 20.04	.2022				
Approved: prof. I	RNDr. Vladimí	r Zeleňák, DrSc.,	, prof. RNDr. St	anislav Krajči, Ph	ıD.	

University	Р	ТŠ	Šafárik	Univer	sity	in	Košice
University.	1.	J. K	Jararik	Univers	sity	III .	RUSICC

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

**Recommended semester/trimester of the course:** 1.

Course level: I.

Prerequisities:

#### **Conditions for course completion:**

Successful completion of two written tests in the middle and at the end of the semester. Accomplished test is with minimal 50% of point. The exact dates will be determined after mutual consultation between the teacher and the students.

The rating scale is determined as follows: A (100-91%), B (90-81%), C (80-71%), D (70-61%), E (60-51%), Fx (50-0%).

#### Learning outcomes:

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

#### **Brief outline of the course:**

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

#### **Recommended literature:**

Potočňák I.: Chemické výpočty vo všeobecnej a anorganickej chémii (skriptum), PF UPJŠ, Košice, 2017.

https://unibook.upjs.sk/sk/chemia/843-chemicke-vypocty-vo-vseobecnej-a-anorganickej-chemii Any chemical laboratory tables.

#### **Course language:**

SK - slovak

#### Notes:

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

Course assessn	<b>ient</b> f assessed studen	ts: 1805						
ABCDEFX								
26.81	26.81         19.0         21.99         19.39         11.58         1.22							
Provides: doc.	Provides: doc. RNDr. Miroslav Almáši, PhD., Mgr. Nikolas Király, PhD.							
Date of last modification: 15.11.2021								
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	ıD.			

University: P. J	. Šafárik Univers	sity in Košice				
Faculty: Facult	y of Science					
Course ID: ÚCHV/ Course name: Chemistry SCHM/21						
Course type, so Course type: Recommende Per week: Pe Course metho	cope and the me d course-load (h r study period: od: present	thod: nours):				
Number of EC	TS credits: 2					
Recommended	semester/trime	ster of the cours	e:			
Course level: I	-					
<b>Prerequisities:</b> BCHU/21 and ( FCHU/21 or Ú0	(ÚCHV/OCHU/ ÚCHV/ACHU/2 CHV/FCHU/10)	21 or ÚCHV/OC 11 or ÚCHV/ACH	HU/03) and ÚC HU/03) and (ÚCI	HV/ANCHU/21 a HV/FCHU/22 or	and ÚCHV/ ÚCHV/	
Conditions for	course complet	ion:				
Learning outco	omes:					
Brief outline of	f the course:					
Recommended	literature:					
Course langua	ge:					
Notes:						
Course assessm Total number o	nent f assessed studer	nts: 81				
А	В	C	D	Е	FX	
12.35	25.93	23.46	16.05	17.28	4.94	
Provides:	L		1		<u> </u>	
Date of last mo	dification: 08.09	9.2021				
Approved: pro	f. RNDr. Vladim	ír Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Ph	D.	

VÝROST, Jozef - SLAMĚNÍK, Ivan. Sociální psychologie. 2., přepr. a rozš. vyd. Praha : GRADA, 2008. 408 s.

VÝROST, Jozef - SLAMĚNÍK, Ivan. Aplikovaná sociální psychologie I : Člověk a sociální instituce. 1. vyd. Praha : Portál, 1998. 384 s. ISBN 80-7178-269-6.

KOMÁRKOVÁ, Růžena - SLAMĚNÍK, Ivan - VÝROST, Jozef. Aplikovaná sociální psychologie III : Sociálněpsychologický výcvik. 1. vyd. Praha : Grada Publishing, 2001. 224 s. VÝROST, Jozef - SLAMĚNÍK, Ivan. Aplikovaná sociální psychologie II. 1. vyd. Praha : Grada Publishing, 2001. 260 s.

**Course language:** 

slovak

Notes:

### **Course assessment**

Total number of assessed students: 0

А	В	С	D	Е	FX
0.0	0.0	0.0	0.0	0.0	0.0

Provides: PhDr. Anna Janovská, PhD., PhDr. Mojmír Trebuňák

**Date of last modification:** 04.02.2025

University: P. J	University: P. J. Šafárik University in Košice								
Faculty: Faculty of Science									
Course ID: CJF PFAJKKA/07	P/ Course na	Course name: Communicative Competence in English							
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present									
Number of ECTS credits: 2									
Recommended semester/trimester of the course:									
Course level: I.									
Prerequisities:									
Conditions for course completion: Active participation in class and completed homework assignments. Students are allowed to miss two classes at the most. 2 credit tests (presumably in weeks 6/7 and 12/13) and an oral presentation in English. Final evaluation consists of the scores obtained for the 2 tests (50%). Final grade will be calculated as follows: A 93-100 %, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64 % and less. Learning outcomes: Brief outline of the course: Recommended literature: www.bbclearningenglish.com Štěpánek, Libor a kol. Academic English-Akademická angličtina. Praha: Grada Publishing, a.s., 2011. McCarthy M., O'Dell F.: English Vocabulary in Use, Upper-Intermediate. CUP, 1994. Eistermenne L. Generatelli L. Lang T.: Applifying homeorements and will P. 100000000000000000000000000000000000									
Principal, 2008.									
Jones L.: Communicative Grammar Practice. CUP, 1985. Additional study materials.									
<b>Course languag</b> English languag	<b>ge:</b> ge, B2-C1 level a	according to CEF	R						
Notes:									
Course assessment Total number of assessed students: 303									
А	В	С	D	Е	FX				
45.21	21.12	17.49	7.59	5.94	2.64				
Provides: Mgr. Barbara Mitríková, Mgr. Viktória Mária Slovenská									

Date of last modification: 06.02.2025
University: P. J. Šafári	ik University in Košice
Faculty: Faculty of Sc	ience
Course ID: CJP/ PFAJGA/07	Course name: Communicative Grammar in English
Course type, scope an Course type: Practice Recommended course Per week: 2 Per stud Course method: pres	nd the method: e se-load (hours): ly period: 28 sent
Number of ECTS cre	dits: 2
Recommended semes	ter/trimester of the course:
Course level: I.	
Prerequisities:	
Conditions for course Active classroom parti by given deadlines. Presentation of a topic Final Test - end of sem Final assessment = ave Grading scale: A 93-1	e completion: cipation (maximum 2 absences tolerated), homework assignments completed e related to the study field. nester, no retake erage of test and presentation. 00%, B 86-92%, C 79-85%, D 72-78%, E 65-71%, FX 64% and less
Learning outcomes: The development of st of their communicat phonological, lexical at efectively use the lang level B2.	tudents' language skills - reading, writing, listening, speaking, improvement tive linguistic competence. Students acquire knowledge of selected and syntactic aspects, development of pragmatic competence. Students can guage for a given purpose, with focus on Academic English and English on
Brief outline of the co Selected aspects of En Word formation Contrast of tenses in E The passive voice Types of Conditionals Phrasal verbs and Eng Words order and collo	purse: aglish grammar and pronunciation English dish idioms cations, prepositional phrases
Recommended literat Vince M.: Macmillan McCarthy, O'Dell: Eng www.linguahouse.com esllibrary.com bbclearningenglish.com ted.com/talks	ture: Grammar in Context, Macmillan, 2008 glish Vocabulary in Use, CUP, 1994 n m

English language, level B2 according to CEFR.

# Notes

Notes:						
Course assessment Total number of assessed students: 446						
А	ABCDEFX					
41.48 19.51 15.7 7.85 5.61 9.87						
Provides: Mgr. Viktória Mária Slovenská, Mgr. Lýdia Markovičová, PhD.						
Date of last modification: 08.02.2025						
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Pł	nD.	

University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of S	cience				
Course ID: KGER/       Course name: Communicative Grammar in German Language         NJKG/07       Value					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of ECTS credits: 2					
Recommended seme	ester/trimester of the course:				

Course level: I.

Prerequisities:

#### **Conditions for course completion:**

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

#### Learning outcomes:

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

#### **Brief outline of the course:**

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

## **Recommended literature:**

Dreyer, H. – Schmitt, R.: Lehr- und Übungsbuch der deutschen Grammatik. Hueber Verlag GmbH & Co. Ismaning, 2009.

Krüger, M.: Motive Kursbuch, Lektion 1 – 30. Huebert Verlag GmbH & Co. Ismaning, 2020. Brill, L.M. – Techmer, M.: Deutsch. Großes Übungsbuch. Wortschatz. Huebert Verlag GmbH & Co. Ismaning, 2011.

Földeak, Hans: Sag's besser!. Grammatik. Arbeitsbuch für Fortgeschrittene. Huebert Verlag GmbH & Co. Ismaning, 2001.

Geiger, S. – Dinsel, S.: Deutsch Übungsbuch Grammatik A2-B2. Huebert Verlag GmbH & Co. Ismaning, 2018.

Dittelová, E. – Zavatčanová, M.: Einführung in das Studium der deutschen Fachsprache. Košice: ES UPJŠ, 2000.

<b>Course langua</b> German, Slova	<b>ge:</b> k language					
Notes:						
<b>Course assess</b> Total number o	nent of assessed studen	ts: 58				
А	В	B C D E FX				
62.07         10.34         8.62         3.45         8.62         6.9						
Provides: Mgr.	Ulrika Strömplov	vá, PhD.				
Date of last mo	odification: 13.08	.2024				
Approved: pro	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Ph	ıD.	

University. F. J. Salarik University in Kösice
Faculty: Faculty of Science
Course ID: ÚINF/ TVY/15Course name: Computability theory
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present
Number of ECTS credits: 4
Recommended semester/trimester of the course: 5.
Course level: I., II., N
Prerequisities:
<b>Conditions for course completion:</b> Two written examinations focused on the construction of Turing machines, creating sequences of (primitive) recursive functions, solving examples. Oral exam focused on the relationship between classes of recursive and computable functions, the problem of stopping a Turing machine.
Learning outcomes: Knowledge of computational model of Turing machine, Goedelian arithmetization, and relationship between Turing computability and recursivity of functions.
Brief outline of the course:         1. Turing machine, basic principles of work of Turing machine, formalization of basic notions         2. Shifting of states, compositions of machines, computations on composed machines         3. Modifications of configuration         4. Elementary Turing machines         5. Compositions of elementary Turing machines         6. Primitively recursive functions         7. Primitively recursive predicates         8. Functions and predicates from number theory         9. Goedelian arithmetizationa of Turing computability         10. Recursive functions         11. Relationship of recursivity and Turing computability         12. Halting problem
<ul> <li>Recommended literature:</li> <li>1. BRIDGES, Douglas. Computability, A Mathematical Sketch book. SpringerVerlag, 1994. ISBN:: 978-0387941745</li> <li>2. BUKOVSKÝ, Lev. Teória algoritmov, ES UPJŠ, Košice, 1999. ISBN 8070973730</li> <li>3. MACHTEY, Michael a Paul YOUNG. An Introduction to the General Theory of Algorithms, NorthHolland, Amsterdam 1978.</li> <li>4. KRAJČI, Stanislav. Teória vypočítateľnosti. http://ics.upjs.sk/~krajci/skola/vyucba/ ucebneTexty/vypocitatelnost.pdf</li> </ul>

Slovak					
Notes:					
<b>Course assessm</b> Total number o	nent f assessed studen	ts: 331			
А	B C D E FX				
53.17 11.18 11.18 4.83 5.14 14.5					
Provides: doc. ]	RNDr. Ľubomír A	Antoni, PhD.			•
Date of last mo	dification: 04.01	.2022			
Approved: prof	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Pł	ıD.

	COURSE INFORMATION LETTER					
University: P. J. Šafá	rik University in Košice					
Faculty: Faculty of Science						
Course ID: ÚINF/ Course name: Computer network Internet PSIN/15						
Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 42 / 14 esent					
Number of ECTS cr	edits: 5					
Recommended seme	ster/trimester of the course: 4.					
Course level: I., N						
Prerequisities: ÚINF	/PAZ1a/15 or ÚINF/PRG1/15					
<b>Conditions for cours</b> Activity at excercises Verbal exam (min 25	e completion: (max 18 points), home work (max 18 points), test (max 30 points). points, max 50 points). Required minimum for passing the course is 55 points.					
Students will get the i the principles of ISO/ the meaning and usag communication chann They will understand principle of routing pr acknowledged TCP the interface of UDP and protocols of the Inter	nformations about principles and achitecture of Internet. They will understand OSI layers reference model for network communication. They will understand ge of terms protocol, service, interface. They will analyze the parameters of nels, understand the function of interconnection devices (hub, switch, router). It the structure of IP packets, addressing and how packets are transmitted, the rotocols and the creation of routing tables. They will understand the priciples of ransport transmission and its implementation. They will know how to use the TCP protocols in a program code. They will understand the basic application net.					
<ul> <li>Brief outline of the c</li> <li>1. Introduction to connetworks, ISO OSI re</li> <li>2. Application layer:</li> <li>3. Application layer:</li> <li>a. Application layer:</li> <li>networks.</li> <li>4. Transport layer: se</li> <li>5. Transport layer: se</li> <li>5. Transport layer: co</li> <li>6. Network Layer:</li> <li>fragmentation, routinn</li> <li>7. Network Layer: ne</li> <li>8. Network Layer: roo</li> <li>9. Link layer: error</li> </ul>	ourse: nputer networks, internet connection types, delay and loss in packet-switched efference model and TCP/IP protocols family. Web and HTTP, protocol FTP ,e-mail and protocols SMTP, POP3, IMAP, domain names and DNS, Peer-to-peer applications. Security in computer rvices, multiplexing and demultiplexing, protocol UDP, reliable data transfer nnection oriented transport protocol TCP, flow and congestion control. Internet protocol IPv4, virtual circuit and datagram networks, packet g table, application protocol DHCP twork address translation NAT, ICMP protocol, internet protocol IPv6 uting algorithms and protocols, broadcast and multicast routing					

11. Physical Layer: Communication channels parameters, digital and analog encoding.

## **Recommended literature:**

- 1. J. F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach, 7. edition, 2016
- 2. A. S. Tanenbaum: Computer Networks, 5. edition, Pearson, 2010
- 3. W. Stallings: Local and Metropolitan Area Networks, Prentice Hall, 2000
- 4. E. Comer, R.E. Droms: Computer Networks and Internets, Prentice Hall, 2003
- 5. W. R. Stevens: TCP/IP Illustrated, Vol.1: The Protocols, Addison-Wesley, 1994

# **Course language:**

Slovak or English

#### Notes:

Content prerequisities: basic programming skills in Java

## **Course assessment**

Total number of assessed students: 316

А	В	С	D	Е	FX
10.76	8.54	19.62	19.94	30.06	11.08

Provides: RNDr. Peter Gurský, PhD., RNDr. Richard Staňa

**Date of last modification:** 04.01.2022

University: P. J. Š	afárik University in Košice					
Faculty: Faculty	of Science					
Course ID: KPPaPZ/ MANAG/25	Course ID: KPPaPZ/ MANAG/25Course name: Conflict Management					
Course type, sco Course type: Pr Recommended Per week: 2 Per Course method	Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of ECTS	S credits: 4					
Recommended se	emester/trimester of the course: 3., 5.					
Course level: I., I						
Prerequisities:						
<b>Conditions for co</b> The conditions for 1. Active particip 2. Submission of strengths and wea	<b>purse completion:</b> r passing the course are as follows: ation in exercises. Max. the missed range is 90 min. the reflection on the selected topic within the specified time. Reflection topic: My knesses in conflict management. In a short presentation of their reflection in the					

strengths and weaknesses in conflict management. In a short presentation of their reflection, in the form of deconstruction, students will describe their strengths and weaknesses in the management of conflict situations with a focus on the application of knowledge, skills and competences needed in conflict situations in the work environment and the school environment.

The evaluation of the course and its subsequent completion will be based on clearly and objectively set requirements, which will be set in advance and will not change. The aim of the assessment is to ensure an objective and fair mapping of the student's knowledge while adhering to all ethical and moral standards. There is no tolerance for students' fraudulent behavior, whether in the teaching process or in the assessment process.

## Learning outcomes:

Successful mastery and demonstration of knowledge in the field of conflict management and control of basic rules.

The method of teaching the subject will be oriented to the student. Lecturers will be interested in students' needs, expectations and opinions so as to encourage them to think critically by expressing respect and feedback on their opinions and needs.

The content of the curriculum will be based on primary and high-quality sources that will reflect the topicality of the topics so as to ensure the connection of the curriculum with other subjects and also the connection of the curriculum with practice. Students will be expected to take an active approach in lectures and seminars with an emphasis on their independence and responsibility.

The student is able to demonstrate an understanding of an individual's behavior in various conflict situations. The student is able to describe, explain and evaluate their own internal resources, competencies as well as limitations and weaknesses that are directly related to conflict management. The student is able to apply theoretical knowledge and principles of conflict resolution to everyday situations.

After completing the course, students will be able to: a) express and summarize basic knowledge related to conflict management; b) understand the basic rules and dynamics of the origin, course

and termination of the conflict; c) apply knowledge in practice, e.g. in the school environment; d) apply key competencies that increase the possibilities of their application in all areas of practice with a special focus on the work of a teacher. They will acquire knowledge from the theory of conflict management as well as capabilities and competences for solving them, e.g. in the context of school teams.

## Brief outline of the course:

Disputes and their causes (Types of disputes, External influences, Be able to reveal the causes of disputes), Dispute origin (Levels of disputes, Escalation warning signals, Escalation removal strategies, Know how to explain escalation stages; How do I approach a dispute?) Dispute Resolution, Dispute Resolution Strategies, Dispute Discussion, Dispute Settlement Initiatives, Knowing how to handle a dispute and how to effectively resolve it), Dispute Resolution (Options, Public Struggle, Covert Struggle, Indefinite Postponement, Agreement, "Fair play", compromise, cooperation, capitulation, escape or separation), Prevention (Structures that produce disputes, The meaning and purpose of disputes, Stages and steps of dispute resolution, What does a positive corporate culture mean? Dispute is an incentive for change)

## **Recommended literature:**

Course language:

Notes:

#### **Course assessment**

Total number of assessed students: 0

0.0 0.0 0.0 0.0 0.0 0.0	А	В	С	D	Е	FX
	0.0	0.0	0.0	0.0	0.0	0.0

Provides: Mgr. Ondrej Kalina, PhD., Mgr. Veronika Borgoňová, PhD.

Date of last modification: 04.02.2025

University: P. J. Šafárik University in Košice							
Faculty: Faculty	Faculty: Faculty of Science						
Course ID: ÚC KCHU/03	HV/	V/ Course name: Coordination Chemistry					
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present							
Number of EC	ГS cre	edits: 4					
Recommended	seme	ster/trimes	ster of the cours	e: 5.			
Course level: I.					_		
Prerequisities:	ÚCHV	V/ACHU/2	1				
<b>Conditions for</b> Final written ex	<b>cours</b> am	e completi	on:				
Learning outco The student acc and properties c compounds.	mes: quires of coo	basic kno rdination c	wledge on the c ompounds as we	oordination com ll as about the cl	pounds, preparat nemical bonding	tion, isomerism in coordination	
<b>Brief outline of</b> 1. Definition an 2. Central atom 3. Coordination 4. Isomerism of 5. Preparation o 6. Stability of co 7. Chemical boo	the conductive d norm and lin numb coord f coord oordin nding	ourse: nenclature of gands bers, coordi lination con rdination com nation comp in coordina	of coordination contraction polyhedra ination polyhedra impounds impounds pounds pounds ation compounds	ompounds. 			
Recommended J. Ribas: Coord J. C. Huheey, E G. A. Lawrance	litera ination . A. K : Intro	<b>ture:</b> n Chemistr eiter, R. L. oduction to	y, Wiley-VCH, V Keiter: Inorgani Coordination Ch	Veinheim, 2008. c Chemistry, Har emistry, Wiley, 2	per Collins, New 2010.	York, 1993.	
Course languag	ge:						
Notes:							
Course assessm Total number of	ent f asses	ssed studen	ts: 106				
А		В	С	D	Е	FX	
40.57	,	24.53	13.21	8.49	11.32	1.89	
Provides: prof.	RNDr	. Juraj Čeri	nák, DrSc., doc. l	RNDr. Juraj Kucl	hár, PhD.		
Date of last mo	difica	tion: 10.09	0.2021				

	COURSE INFORMATION LETTER						
University: P. J. Šafá	rik University in Košice						
Faculty: Faculty of S	cience						
<b>Course ID:</b> ÚINF/ KRS/15	Course ID: ÚINF/ Course name: Cryptographic systems and their applications KRS/15						
Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 42 / 28 esent						
Number of ECTS cr	edits: 6						
Recommended seme	ster/trimester of the course: 3.						
Course level: I., N							
Prerequisities:							
<b>Conditions for cours</b> Homeworks, midtern Final written exam, p	e completion: n written exam, active participation in laboratory exercises. cossibly oral exam.						
This course covers the is on definitions, theo practice. Topics inclu- block cipher design a an introduction to cry- and certificates.	e basic knowledge in understanding and using cryptography. The main focus pretical foundations, and rigorous proofs of security, with some programming ide symmetric and public key encryption, message integrity, hash functions, and analysis, number theory, and digital signatures. The course also provides /ptographic protocols for authentication and key management, including PKI						
Brief outline of the c Classical cryptograp Symmetric ciphers - ciphers - RSA, Elga codes, digital signatu	ourse: hy, basic information theory, cryptoanalysis, security of classical ciphers. stream ciphers, block ciphers (DES, AES), modes of operation. Asymmetric mal, elliptic curve cryptosystems. Hash functions, message authentication res. Authentication, key establishment and distribution, certificates.						
Recommended litera 1. PAAR, Ch., PELZ 2. STINSON, D. R. 3. MAO, W. Modern 4. MENEZES, A., O CRC Press, 1996. 5. SCHNEIER, B.: A	Ature: L, J.: Understanding Cryptography, Springer 2010. PATERSON, M. B.: Cryptography: Theory and Practie. CRC Press, 2018. Cryptography: Theory and Practice. Prentice Hall, 2003. ORSCHOT, P. van, VANSTONE, S.: Handbook of Applied Cryptography. .pplied Cryptography, 20th Edition, John Wiley & Sons Inc., 2015						
<b>Course language:</b> Slovak or English							
<b>Notes:</b> Content prerequisitie	s: basic number theory and algebra, basic programming						

Course assessm	nent				
Total number o	f assessed studen	ts: 136			
А	В	С	D	Е	FX
14.71	8.82         13.97         16.18         31.62         14.71				
Provides: doc. RNDr. Jozef Jirásek, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.					
Date of last modification: 08.01.2022					
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					

University: P. J. Šafá	rik University in Košice
<b>Faculty:</b> Faculty of S	cience
<b>Course ID:</b> ÚINF/ DBS1a/15	Course name: Database systems
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 28 esent
Number of ECTS cr	edits: 5
Recommended seme	ster/trimester of the course: 3.
Course level: I.	
Prerequisities:	
Conditions for cours Demonstration of add evaluation, the ability project. Written works during Written and oral exam	e completion: equate mastery of the content standard of the subject in the ongoing and final y to formulate a problem in the acquired terminology and solve it within a the semester, project. n.
Learning outcomes: After completing the apply standard data n	course, the student acquires the principles of relational databases, is able to nodels, design relational databases and formulate filtering queries.
<ul> <li>Brief outline of the c</li> <li>1) Relational databas</li> <li>2) Data types, operate</li> <li>3) JOIN operations.</li> <li>4) AGGREGATION</li> <li>5) Data and database</li> <li>6) DB design, ER dia</li> <li>7) System commands</li> <li>8) Nested queries. RO</li> <li>9) Three-valued logic</li> <li>10) Data science and</li> <li>11) Data warehouses.</li> <li>12) Normalization of</li> </ul>	ourse: es. Query language SQL, filtering. ors, numerical, string and time functions. AND GROUP BY. models. Relational scheme. RDB principles. Data integrity. agrams. about DB and tables. Cascading deletion and update. DLLUP. CASE expression. c. Quantifiers and NOT. Set operations. knowledge acquisition using R. Data cube. Pivot table. relational databases - 1. Relational algebra.
Recommended litera C.J. Date, Database I 978-1-449-32801-6 J. Murach, Murach's 1943872368	nture: Design and Relational Theory, 2012, O'Reilly Media, Inc., ISBN: MySQL, 3rd Edition, 2019, Mike Murach & Associates, Inc., ISBN-10:
- R. Ramakrishnan, J 9780071231510 - S. Krajčí: Databázo	. Gehrke, Database Management Systems, 2020, McGraw-Hill, ISBN13 vé systémy, UPJŠ, 2005

Course language Slovak or Engli	ge: ish				
Notes:					
Course assessm Total number o	nent f assessed studen	ts: 983			
А	В	С	D	E	FX
11.5	10.78	19.33	21.87	30.11	6.41
Provides: doc.	RNDr. Csaba Töi	rök, CSc., RNDr.	Lukáš Miňo, Ph	D.	
Date of last mo	dification: 08.01	.2022			
Approved: prof	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
<b>Course ID:</b> ÚINF/ DBS1b/15	Course name: Database systems
Course type, scope a Course type: Lectur Recommended cou Per week: 2 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 28 esent
Number of ECTS cr	edits: 6
Recommended seme	ster/trimester of the course: 4.
Course level: I.	
Prerequisities: ÚINF	/DBS1a/15
<b>Conditions for course</b> Demonstration of add evaluation, the abilit project. Written works during Written and oral exam	<b>te completion:</b> equate mastery of the content standard of the subject in the ongoing and final y to formulate a problem in the acquired terminology and solve it within a g the semester, project. n.
Learning outcomes: After completing the relational databases, t with non-relational d	course, the student will be able to apply more sophisticated techniques of heoretical analysis of functional dependencies of attributes and is able to work atabases.
Brief outline of the c 1) Introduction to SQ 2) Stored procedures 3) Views. CTE, recur 4) Transactions. Curs 5) Triggers and integ 6) XML documents a 7) Functional depend 8) The latest normal 9) Big data and NoSQ 10) MongoDB, CRU 11) Aggregations and 12) Replication and s	ourse: L Server. Set operations. Window functions. System and user functions. sion and transitive closure. ors. Pivoting. rity. Physical organization of data, B-trees and indexes. and their querying. JSON. encies and NF. form - ETNF. QL. D and cursors. hindices. harding.
Recommended litera - Date C.J., Database - I. Ben-Gan, D. Sark 978-0-7356-8504-8	n <b>ture:</b> Design and Relational Theory, O'Reilly, 2012 a, A. Machanic, K. Farlee, T-SQL Querying, 2015, Microsoft Press, ISBN:

- I. Ben-Gan, T-SQL Fundamentals, Third Edition, 2016, Microsoft Press, ISBN: 978-1-5093-0200-0

- L. Davidson, Pro SQL Server Relational Database Design and Implementation, 2021, Apress, ISBN-13: 978-1-4842-6496-6

- K. Chodorow, MongoDB: The Definitive Guide, O'Reilly, second edition, 2013

# **Course language:**

Slovak or English

# Notes:

If necessary, teaching, mid-term and final evaluation will be by distance form.

# **Course assessment**

Total number of assessed students: 793

А	В	С	D	Е	FX
9.58	8.7	14.12	24.34	33.54	9.71

Provides: doc. RNDr. Csaba Török, CSc., RNDr. Dávid Varga, RNDr. Lukáš Miňo, PhD.

Date of last modification: 08.01.2022

University: P. J. Šafár	ik University in Košice
Faculty: Faculty of So	cience
Course ID: KPPaPZ/PUDB/15	Course name: Drug Addiction Prevention in University Students
Course type, scope an Course type: Practic Recommended cour Per week: 2 Per stue Course method: pre	nd the method: re rse-load (hours): dy period: 28 sent
Number of ECTS cre	edits: 2
Recommended semes	ster/trimester of the course: 3., 5.
Course level: I.	
Prerequisities:	
<b>Conditions for course</b> 1st of the evaluation: a participation in works 50 - 45: A; 44 - 40: 1 the electronic bulletin a combined method.	e completion: active participation in the training part (30p). 2nd part of the evaluation: active hops (20p). In total, students can get 50p and the final evaluation is as follows: B; 39-35: C; 34-30: D; 29 - 25: E 24 and less: FX. Detailed information in board of the course in AIS2. The teaching of the subject will be realized by
Learning outcomes: The student understat describe and explain substance use. Studen of substance and non- The student is also a approaches in prevent The student is able to and assume their posi	nds the principals of research data based prevention of risk behavior, can the determinants of risk behavior as well as protective and risk factors for t understands and adequately interprets the theory explaining the background substance addictions. ble to state and classify the types and forms of prevention, strategies and tion, can distinguish effective strategies from ineffective ones. adequately interpret their experience with preventive activities in the group tive effect as well as limitations and threats.
Brief outline of the co	ourse:
Recommended litera Orosová, O. a kol. (20 internetu v školskej p Sloboda, Z., & Bukos and Practice. New Yo National and internati	ture: D12). Základy prevencie užívania drog a problematického používania raxi. Košice: UPJŠ. ki, J. (Eds.). (2006). Handbook of Drug Abuse Prevention: Theory, Science, rk: Springer. onal scientific journals.
<b>Course language:</b> slovak	
Notes:	

Course assessm Total number of	nent f assessed studen	ts: 663			
А	В	С	D	Е	FX
79.34	14.93	3.92	1.36	0.15	0.3
<b>Provides:</b> prof. PhDr. Oľga Orosová, CSc., Mgr. Janka Liptáková, PhDr. Anna Janovská, PhD., Mgr. Zuzana Michalove					
Date of last mo	dification: 24.06	5.2022			
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					

Page: 56

University: P. J. Šafa	árik University in Košice
Faculty: Faculty of S	Science
<b>Course ID:</b> ÚINF/ EDS/15	Course name: Educational software
Course type, scope a Course type: Pract Recommended cou Per week: 2 Per st Course method: pr	and the method: ice irse-load (hours): udy period: 28 resent
Number of ECTS c	redits: 2
Recommended sem	ester/trimester of the course: 5.
Course level: I.	
Prerequisities:	
Conditions for cour Conditions for ongo 1. Creation of a wor 2. Creation of a mul 3. Creation of an int 4. Creation of an ins Conditions for the fi Creation and presen Conditions for succe Obtaining at least 50	se completion: ing evaluation: ksheet for student. timedia educational game. eractive educational quiz. tructional educational video. nal evaluation: tation of final project on the use of educational software in education. essful completion of the course: 0% of points for ongoing and final assignments.
Learning outcomes Students will receive a) presentation softw conceptual maps, b) programs for the c) simulation and me d) selected subject-out Students present and resources and tools in	e, resp. deepen their basic skills in working with: ware, programs for creating and editing images, animations, diagrams, sounds, creation of didactic tests, questionnaires, surveys, odeling software, wriented educational programs, I discuss their idea of the use of educational software and educational Internet in the selected school subject.
<ul> <li>Brief outline of the</li> <li>1. Overview of educe</li> <li>2. Creating and procession</li> <li>3. Creation and use of textbooks and workle</li> <li>4. Creation of instrue</li> <li>5. Electronic voting</li> <li>6. Creation of didact</li> <li>7. Collaborative web</li> <li>8. Online communication</li> <li>9. Complex online lease</li> </ul>	<b>course:</b> ational software and educational web resources and tools. essing of materials for teaching aid . of electronic and interactive educational documents (worksheets, presentations, pooks). ctional educational video. and questionnaire creation. ic tests and educational games. Gamification elements, tools and environments. o applications. eation tools. earning environments.

10. Online educational platforms, repositories, projects and competitions.

11. Simulations and modelling. Subject-focused educational programmes.

12. Use digital tools to plan, monitor, differentiate and personalise learning. Accessibility of digital tools and learning resources.

## **Recommended literature:**

SOLOMON, Gwen and Lynne SCHRUM, 2014. Web 2.0 How-to for Educators. Second. International Society for Technology in Education, 314 p. ISBN 978-1564843517.

STOBAUGH, Rebecca, 2019. Fifty Strategies to Boost Cognitive Engagement: Creating a Thinking Culture in the Classroom (50 Teaching Strategies to Support Cognitive Development). Solution Tree Press, 176 p. ISBN 978-1947604773.

LEMOV, Doug, 2015. Teach Like a Champion 2. 0: 62 Techniques That Put Students on the Path to College [online]. 2nd edition. John Wiley & Sons, Incorporated, 509 p. [cited 2021-7-10]. ISBN 9781118898628. Available from: https://ebookcentral.proquest.com/lib/upjs-ebooks/ detail.action?docID=1895720

European Schoolnet: Transforming education in Europe [online]. [cited 2021-7-10]. Available from: http://www.eun.org/home

Science On Stage Europe [online]. Science on Stage Europe e.V. [cited 2021-7-10]. Available from: https://www.science-on-stage.eu/

## **Course language:**

Slovak and partly English due to selected programs and information sources

#### Notes:

By default, teaching is carried out face to face. If this is not possible (eg due to a pandemic), teaching is provided at a distance through video conferencing programs and LMS.

#### **Course assessment**

Total number of assessed students: 106

А	В	С	D	Е	FX
76.42	11.32	7.55	0.0	4.72	0.0

Provides: Ing. Zuzana Tkáčová, Ing.Paed.IGIP.

## **Date of last modification:** 16.03.2024

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: CJP/ PFAJ4/07	Course name: English Language of Natural Science
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 28 esent
Number of ECTS cr	edits: 2
Recommended seme	ster/trimester of the course: 4.
Course level: I.	
Prerequisities:	
Conditions for cours Active participation i 2 classes at the most Continuous assessme 1 credit test taken pre 1 project (quiz on the 5 LMS quizzes (25% In order to be admitte assessment The exam test results represent the other 50 The final grade for th A 93-100, B 86-92, C Learning outcomes: Enhancement of stude in English for specifie Students obtain know	e completion: n class and completed homework assignments. Students are allowed to miss nt: sumably in weeks 6/7 topic of the student's field of study) 25% of the continuous assessment of the continuous assessment) ed to the final exam, a student has to score at least 65 % from the continuous represent 50% of the final grade for the course, continuous assessment results 0% of the final grade. le course will be calculated as follows: 2 79-85, D 72-78, E 65-71, FX 64 and less. ents' language skills (speaking, writing, reading and listening comprehension) c and academic purposes and development of students' linguistic competence. wedge of selected phonological, lexical and syntactic aspects of professional ir pragmatic competence - students can effectively use the language for a given
purpose, and acquire sciences.	presentation skills at B2 level (CEFR) with focus on terminology of natural
Brief outline of the c 1. Introduction to stud 2. Selected aspects of 3. Talking about acad 4. Discussing science 5. Defining scientific 6. Expressing cause a 7. Describing structur 8. Explaining process 9. Comparing objects	ourse: dying language f scientific language lemic study terminology and concepts and effect res ses s, structures and concepts

# 10. Talking about problem and solution

- 11. Referencing authors
- 12. Giving examples
- 13. Visual aids and numbers
- 14. Referencing time and place

Presentation topics related to students' study fields.

# **Recommended literature:**

lms.upjs.sk - e-kurz Odborný anglický jazyk pre prírodné vedy.

Redman, S.: English Vocabulary in Use, Pre-intermetdiate, Intermediate. Cambridge University Press, 2003.

Armer, T.: Cambridge English for Scientists. CUP, 2011.

Wharton J.: Academic Encounters. The Natural World. CUP, 2009.

P. Fitzgerald : English for ICT studies. Garnet Publishing, 2011.

https://worldservice/learningenglish, https://spectator.sme.sk

www.isllibrary.com

linguahouse.com

## **Course language:**

English, level B2 (CEFR)

## Notes:

## **Course assessment**

Total number of assessed students: 3246

А	В	С	D	Е	FX
38.63	26.31	16.3	9.52	7.18	2.06

Provides: Mgr. Viktória Mária Slovenská

Date of last modification: 06.02.2024

University: P. J. Šafárik University in Košice
Faculty: Faculty of Science
Course ID: ÚINF/ BSSMI/22Course name: Essentials of Informatics
Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present
Number of ECTS credits: 2
Recommended semester/trimester of the course:
Course level: I.
<b>Prerequisities:</b> ÚINF/PSIN/15 and ÚINF/PAZ1b/15 and ÚINF/OSY/24 and ÚINF/AFJ1a/15 and ÚINF/SLO1a/15
Conditions for course completion:
Learning outcomes:
Brief outline of the course:
Recommended literature:
Course language:
Notes:
Course assessment Total number of assessed students: 4
A B C D E FX
0.0 50.0 0.0 50.0 0.0 0.0
Provides:
Date of last modification: 07.02.2022
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.

University: P. J.	Šafárik Univers	ity in Košice						
Faculty: Faculty	of Science							
Course ID: ÚCH PCH1/00	ÚCHV/ Course name: Food chemistry							
Course type, sco Course type: L Recommended Per week: 2 / 1 Course method	pe and the met ecture / Practice course-load (h Per study perio : present	<b>ours):</b> od: 28 / 14						
Number of ECT	S credits: 4							
Recommended s	semester/trimes	ster of the cours	se: 5.					
Course level: I.,	II.							
Prerequisities:								
<b>Conditions for c</b> Active work dur second at the end FX: 0-50b.	ourse completi ing semester, p l of semester (m	on: resentation on c in. 51%). A: 91-	ertain theme. Tw 100b, B: 81-90b,	vo exams, one in C: 71-80b, D: 61	the middle and -70b, E: 51-60b,			
Learning outcor Students will re importance and o	nes: cieve informati chemical change	ons and knowl es in food during	edges about che processing and	emical substance: storage.	s in food, their			
<b>Brief outline of</b> The main categor carbohydrates. V colorants, toxic o	t <b>he course:</b> ries of substance Vater, minerals, l compounds, adit	s in the most imp low concentratio ives. Chemical	oortant group of f n anorganic com eactions in dairy	ood. Aminoacids, pounds, vitamins / products.	, proteins, lipids, . Hydrocarbons,			
Recommended I	iterature:							
Course language english	2:							
Notes: Teaching is carri (BigBlueButton) semester, update	ed out in person tool. The form d continuously.	or, if necessary of teaching is sp	, online using the pecified by the te	e MS Teams or B acher at the begir	BB nning of the			
<b>Course assessme</b> Total number of	ent assessed studen	ts: 334						
A	В	С	D	Е	FX			
69.76	26.05	3.89	0.0	0.0	0.3			
Provides: RNDr.	Ján Elečko, Ph	D.		<u>.</u>				
Date of last mod	ification: 28.01	.2022						
Approved: prof.	RNDr. Vladimí	r Zeleňák, DrSc	., prof. RNDr. St	anislav Krajči, Pl	າD.			

Faculty: Faculty of Science

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

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

**Per week:** 2 / 1 **Per study period:** 28 / 14

Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

#### **Conditions for course completion:**

Elaboration and presentation of a semester project with an assigned topic. Completion of block exercises. Oral examination.

Detailed conditions for completing the subject are listed in the electronic bulletin board of the subject and in the repository of digital support materials LMS UPJŠ and are updated annually.

#### Learning outcomes:

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

#### Brief outline of the course:

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

#### **Recommended literature:**

1. Chromý, V. a kol.: Bioanalytika, MU Brno, 2002

2. Kukačka, J. a kol.: Bioanalytická chemie v príkladech a cvičeních, Karolinum, 2010

3. Mikkelsen, S.R, Cortón E.: Bioanalytical Chemistry, Wiley, 2004

4. Wilson I.: Bioanalytical Separations 4, (Handbook of Analytical

Separations), Elsevier, 2003

5.Lee, D.C., Webb, M.: Pharmaceutical Analysis, Blackwell, 2003

#### Course language:

Notes:

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

# Course assessment

Total number o	f assessed studen	ts: 112				
А	В	С	D	Е	FX	
33.04	30.36	31.25	4.46	0.0	0.89	
Provides: doc. RNDr. Katarína Reiffová, PhD.						
Date of last modification: 22.07.2022						

		CO	URSE INF	FORN	MATIO	ON LETI	ER		
University: P. J.	Šafárik Uni	ivers	ity in Košic	ce					
Faculty: Faculty	of Science								
Course ID: ÚCH VCHU/15	IV/ Cours	se na	me: Gener	al Ch	emistr	y			
Course type, sco Course type: L Recommended Per week: 4 / 2 Course method	pe and the ecture / Pra- course-loa Per study j : present	met ctice d (he perio	hod: ours): od: 56 / 28						
Number of ECT	'S credits: 7	7							
Recommended s	semester/tr	imes	ter of the o	cours	<b>e:</b> 1.				
<b>Course level:</b> I.									
Prerequisities: (	JCHV/CHV	/1/99	)						
<b>Conditions for c</b> Written test in the participation on	ourse comp ne middle a seminars.	pletion and the	on: ne end of th	he ser	nester	followed	by the	e oral exar	nination. Activ
<b>Learning outcol</b> To provide stude of chemical bon periodicity.	nes: ents with ki ds, physical	nowl l and	edge of ato chemical I	oms a proper	nd mo rties of	lecules the elements	neir ele and c	ctronic st ompounds	ructure, theories as well as the
Brief outline of Main terms use periodicity and intermolecular in Solutions. Chen Classification of	the course: d in chem its effect nteractions. nical equili chemical re	istry. on the Cher briur eactio	Atoms – he propert mical struc n. Basis co ons. Electro	mod ies of ture a of che ochem	els of f elem and phy emical histry.	atoms, e ents, rad /sical proj thermody	electror ioactiv perties ynamic	1 configur ity. Chem of matter. s and ch	ration, chemica nical bonds an State of matte emical kinetic
Recommended I 1. Atkins P., Jon 2. Russel J.B.: G	<b>iterature:</b> es L.: Chem eneral Cher	nical mistr	Principles, y, 2nd ed.,	2nd e McGi	ed., Fre raw Hi	eman, Ne ll, Londo	ew Yor n 1992	k 2002.	
Course languag	e:	1							
Notes:									
Course assessme Total number of	ent assessed stu	uden	ts: 413						
А	B		C			D	1	E	FX

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

28.09

Date of last modification: 07.02.2022

27.36

24.7

Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.

12.35

6.78

FX

0.73

University:	Р	J	Šafárik	University	/ in	Košice
University.	1.	J.	Salarik	University	/ 111	KUSICC

Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: General Course of Analytical Chemistry - Laboratory
PACU/03	

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

Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚCHV/ANCHU/03 or ÚCHV/ANCHU/21

#### **Conditions for course completion:**

Active participation in laboratory exercises and seminars; successful completion of the tests.

1. Participation in laboratory exercises is required. Assigned teacher who leads exercises might excuse without substitute the student's absence (incapacity for work, family reasons, etc.) for a maximum of two exercises during the semester with substitute supplying.

The assigned teacher, who leads the seminar, assesses the preparation of students and their activity in seminars. For the active participation in the exercises, the student can get a maximum of 10 points.
 Two written tests are obligatory. The written test will consist of 15 questions with 15 points, together for 2 written testes of 30 points. To successful completion of the exam, it is necessary to achieve at least 8 points from each test.

Overall score: Max. number of points: 50 (elaboration of protocols / assignments - 10 points; active participation in practical exercises - 10 points; written tests -  $2 \times 15$  points). Min. number of points to successful completion of course: 26.

Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

#### Learning outcomes:

Application of theoretical knowledge of qualitative and quantitative analytical chemistry into analytical laboratory practise.

#### Brief outline of the course:

Practical in qualitative and quantitative analysis. Qualitative analysis, separation by selective precipitation. Quantitative methods. Gravimetry, general principles of method. Volumetric methods. Preparation of accurate solutions. Indication of equvivalency point. Titration curves, calculations in volumetric analysis. Acidimetry, alkalimetry. Manganometry. Iodometry. Complexometry. Selected Instrumental analytical methods.

#### **Recommended literature:**

- 1. Y. Bazel a kol.: Praktikum z analytickej chémie, PF UPJŠ, Košice 2019.
- 2. T. Gondová a kol.: Praktikum z analytickej chémie, PF UPJŠ, Košice 1999.
- 3. V. Szmereková, P.Mel'uch: Praktikum z analytickej chémie, PF UPJŠ, Košice 1988.
- 4. J. Labuda a kol. Analytická chémia, STU, Bratislava 2014.
- 5. Z. Holzbecher a kol: Analytická chemie, SNTL, ALFA Praha 1987.

## 6. L. Koller: Analytická chémia, TU Košice, 2002, skriptum a v digitálnej forme. 7.D. Harvey: Modern Analytical Chemistry. McGraw Hill, Boston, 2000.

## **Course language:**

Slovak

## Notes:

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

#### **Course assessment**

Total number of assessed students: 425

А	В	С	D	Е	FX
60.0	26.82	10.59	1.41	1.18	0.0

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

Date of last modification: 15.11.2021

University: P. J	. Šafárik Univers	ity in Košice					
Faculty: Facult	y of Science						
Course ID: KP POŽ/21	E/ <b>Course na</b>	Course name: Getting to know the Student in Education					
Course type, sc Course type: I Recommended Per week: 2 Pe Course metho	ope and the met Practice d course-load (h er study period: d: present	thod: ours): 28					
Number of EC	<b>FS credits:</b> 2						
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4.				
Course level: I.							
Prerequisities:							
<b>Conditions for</b>	course completi	ion:					
Learning outco	omes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessm Total number of	ent f assessed studen	ts: 113					
А	В	С	D	Е	FX		
65.49	65.49 19.47 7.96 2.65 0.0 4.42						
Provides: Paedl	Dr. Michal Novo	cký, PhD., Mgr.	Beáta Sakalová, I	PhD.			
Date of last mo	dification: 12.03	3.2024					
Approved: prof	. RNDr. Vladimí	ír Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

University: P. J.	. Šafárik Univers	ity in Košice					
Faculty: Faculty	y of Science						
Course ID: KP INP/17	KPE/     Course name: Inclusive Pedagogy						
Course type, sc Course type: H Recommended Per week: 2 Pe Course metho	ope and the met Practice d course-load (h er study period: d: present	thod: ours): 28					
Number of EC	IS credits: 2	4 641					
Recommended	semester/trimes	ster of the cours	<b>e:</b> 5.				
Course level: 1.							
Prerequisities:							
Conditions for	course completi	on:					
Learning outco	mes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessm Total number of	ent f assessed studen	ts: 138					
А	В	С	D	Е	FX		
71.74	71.74 21.74 2.9 1.45 2.17 0.0						
Provides: Paedl	Dr. Michal Novo	cký, PhD.					
Date of last mo	dification: 14.09	9.2024					
Approved: prof	. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

University: P. J. Šafárik University in Košice
Faculty: Faculty of Science
Course ID: ÚINF/ IKTP/15Course name: Information and Communication Technologies
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present
Number of ECTS credits: 2
Recommended semester/trimester of the course: 3., 5.
Course level: I.
Prerequisities:
<b>Conditions for course completion:</b> Problems solved during the semester. A final project using presentation programs, spreadsheet programs, text processors, internet resources and search tools. The ECDL certificate (all 7 modulus) is accepted as the exam with the ranking "A-výborne".
<b>Learning outcomes:</b> To achieve and extend fundamental information and communication knowledge to the level which is acceptable in the EU region.
<ul> <li>1.Information sheet of the subject. ÚINF / IKTP, content of the exercise, teaching resources, evaluation of the subject, examples of projects, e-mail (message structure, attachments, addresses, signature, filters),</li> <li>2.WWW (advanced information search, bookmarks - naming, organizing, exporting, importing, feeds - iGoogle)</li> <li>3.Word (font, search and replace, inserting links, symbols and images, tabs, line breaks, paragraphs, pages, multi-column rate, tables)</li> <li>4.Word (paragraph styles, sections, header and footer, content and index creation)</li> <li>5.Word (revision, mass correspondence, creation of forms, printing the document to the printer and to PDF)</li> <li>6.Word (overview of typographic rules, project creation1 - design of structure and content)</li> <li>7. Excel (workbook, sheet, table, cells (cell format), formulas (aggregation functions), data filtering, graphs)</li> <li>8.PowerPoint (inserting slides with different layouts, tables, graphs, multimedia objects, changing designs, creating a presentation by importing a text file), submission of PROJEKT1 (text in the style of the final thesis) by e-mail to lubomirsnajder@gmail.com (Subject: IKTP - projekt1)</li> <li>9.PowerPoint (slide master, slide numbering, presentation navigation - links, buttons, image compression, line color change)</li> <li>10.PowerPoint (project creation2 - structure and content design)</li> </ul>

12 Procentation	$\mathbf{D}\mathbf{D}\mathbf{O}\mathbf{I}\mathbf{E}\mathbf{V}\mathbf{T}2$ (D <sub>2</sub>	warDaint pragan	tation		
12. Presentation	n PROJEK 12 (Po n PROJEKT2 (Po	owerPoint presen	tation)		
Recommended 1. Franců, M: J 978-80-251-14 2. Jančařík, A. 152 s. ISBN 80 3. Kolektív autrinternete: < http: SvlabusV50 S	literature: ak zvládnout test 85-8. et al.: S počítačer 0-251-1844-3. orov: Sylabus EC p://www.ecdl.sk/b K-V01 FIN.pdf>	y ECDL. Praha : n do Evropy – E DL verzia 5.0. [4 uxus/docs//interr	Computer Press CDL. 2. vydanie on-line] [citovan ne_informacie/Sy	, 2007. 160 s. ISI . Praha : Comput é 9.2.2010]. Dost /labus_V5.0/2009	BN er Press, 2007. tupné na 90630ECDL-
<b>Course langua</b> Slovak or Engl	ge: ish				
Notes:					
<b>Course assessn</b> Total number o	nent f assessed studen	ts: 1035			
А	В	С	D	Е	FX
65.6	17.78	6.86	3.57	1.64	4.54
Provides: doc.	RNDr. Ľubomír A	Antoni, PhD.		1	1
Date of last mo	dification: 23.11	.2021			
Approved: pro	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	unislav Krajči, Pł	ıD.

Faculty: Faculty of Science

Course ID: ÚCHV/	<b>Course name:</b> Inorganic Chemistry
ACHU/21	

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

**Course method:** present

**Number of ECTS credits: 5** 

Recommended semester/trimester of the course: 2.

Course level: I.

**Prerequisities:** ÚCHV/VCHU/15

#### **Conditions for course completion:**

Written test in the middle and the end of the semester followed by the oral examination. Active participation on seminars.

#### Learning outcomes:

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

#### Brief outline of the course:

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

#### **Recommended literature:**

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

#### **Course language:**

Notes:

# **Course assessment**

Total number of assessed students: 90

А	В	С	D	Е	FX	
31.11	30.0	24.44	7.78	6.67	0.0	
Provides: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Juraj Černák, DrSc.						
Date of last modification: 07.02.2022						
Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Inorganic Chemistry II
ACH2/21	

Course type, scope and the method:

**Course type:** Lecture / Practice

**Recommended course-load (hours): Per week:** 3 / 2 **Per study period:** 42 / 28

Course method: present

Number of ECTS credits: 6

**Recommended semester/trimester of the course:** 3., 5.

Course level: I.

Prerequisities: ÚCHV/ACH1/10 or ÚCHV/ACHU/21 or ÚCHV/ACHU/03

#### **Conditions for course completion:**

1. Students are required to attend seminars, this also applies to the online form of teaching. The relevant teacher who leads the seminar will justify the absence of the student (illnes, family reasons, etc.) in a maximum of two seminars during the semester without the need to replace the teaching hours. In the case of a longer justified absence (for example due to illness), the teacher will assign to the student alternative forms of duties;

2. Activity at seminars. The preparation of students and their activity in seminars is always assessed by the teacher who leads the seminar, within his / her competence.

3. Participation in 10 small written tests within the seminar, for each small test you can get 1 point. In the case of a justified absence of a student from a small test, the teacher may require to elaborate a written job. Successful completion is considered if the student obtains at least 5.5 points from these tests, which is a condition for participation in the exam. The points obtained from the seminar will be included in the total number of points obtained for the subject in the range of 10%.

4. The exam is usually carried out in written form (3 written tests, of which 2 tests during the semester) with the possibility of further oral examination, or, in case of restrictions of contact forms of the teaching, the exam will be performed in a suitable online - electronic form.

5. To successfully complete the course, it is necessary to obtain at least 51% of the maximum number of points in each test and for seminars.

#### Learning outcomes:

To acquire knowledge about physical and chemical properties of metallic elements and their compounds.

### Brief outline of the course:

General characterization of metals, chemistry of elements of the 1st and 2nd group, aluminum and other metals elements of groups 13 to 16. Chemistry of transition elements with emphasis on the 1st transition series.

Coordination compounds, chemistry of lanthanides and actinides. In all chapters are discussed the atomic properties of elements, properties of elements as substances, properties of their compounds. Emphasis is also put on environmental aspects of the properties of elements and their compounds. The lectures are discussed at the seminars in detail.

### **Recommended literature:**

Greenwood, N.N., Earnshaw, A.: Chemistry of the elements, Pergamon Press N.Y., 1984.
 D.F. Shriver, P.W. Atkins: Inorganic Chemistry, Oxford University Press, Oxford, 4th Ed., 2006.

## **Course language:**

## Notes:

The subject can be realized in the form of personal attendance or, if necessary, also in online form.

## **Course assessment**

Total number of assessed students: 54

А	В	С	D	Е	FX
12.96	20.37	37.04	20.37	5.56	3.7

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

Date of last modification: 16.11.2021

University is J. Dalatik University in KUSICO	University:	P. J	Šafárik	University	in Košice
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Faculty: Faculty of Science

**Course ID:** ÚCHV/ **Course name:** Instrumental Analytical Chemistry ANCH1b/21

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 2 / 2 Per study period: 28 / 28

Course method: present

**Number of ECTS credits: 5** 

Recommended semester/trimester of the course: 4., 6.

Course level: I.

Prerequisities:

#### **Conditions for course completion:**

Active participation in seminars; successful completion of the final test. Elaboration of 2 written assignments (or subject project), which will be one of the conditions for participation in the exam. The evaluation of the student's study results within the study of the subject is carried out by a combination of continuous control during the teaching part of the semester (50%) with an examination during the examination period (50%).

Note: Detailed conditions are updated annually within the repository for digital support materials (LMS UPJŠ).

#### Learning outcomes:

The student acquires knowledge of the theoretical foundations and instrumentation in analytical chemistry.

#### **Brief outline of the course:**

Classification of instrumental analytical methods. Basic parts of analytical instruments. Comparison of range, accuracy, detection limit, selectivity and economic characteristics of analytical methods. Analytical signal and calibration. Detection limit. Standard addition method. Accuracy and precision. Spectral methods. Electromagnetic radiation. Analytical signal of the optical methods. Classification of spectral and optical analytical methods. Instrumentation of spectral methods. Basic parts of instruments in spectral analysis: optical elements, radiation sources, monochromators, detectors (scheme, principle, basic characteristics, advantages and disadvantages). Molecular spectrometry. Nephelometry and turbidimetry. Luminescence analysis. Infrared spectroscopy. Raman spectroscopy. Refractometry. Chiroptical methods. Mass spectroscopy. Atomic spectral methods. Atomic absorption spectroscopy. Atomic emission spectral analysis. Atomic fluorescence spectrometry. Separation and preconcentration methods. Classification of separation methods. Chromatographic and non-chromatographic separation methods. Basic characteristics of separation methods. Non-chromatographic separation methods. Chromatographic methods of separation. Classification of chromatographic methods. Elution characteristics. Liquid chromatography. Gas chromatography. Supercritical fluid chromatography. Basic parts of instruments in chromatography. Electroanalytical methods. Basic principle of electroanalytical methods and their division. Potentiometry. Polarography. Voltammetry. Electrogravimetry. Coulometry. Conductometry.

### **Recommended literature:**

1. Labuda a kol. Analytická chémia. ISBN: 9788022742429, Vydavateľstvo: STU Bratislava, Rok vydania: 2014, Počet strán: 671

2. Christian G.D. Analytical Chemistry. John Wiley & Sons, Inc. New York – Chichester – Brisbane – Toronto – Singapore 1994.

3. Holtzclaw H.F., Jr., Robinson W.R. College Chemistry with Qualitation Analysis. D.C. Heath and Company 1988.

# **Course language:**

Slovak

# Notes:

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

A calculator is required to master the calculation exercises. Not a cell phone!

# **Course assessment**

Total number of assessed students: 25

А	В	С	D	Е	FX
16.0	40.0	16.0	8.0	20.0	0.0

Provides: prof. Mgr. Vasil' Andruch, DSc.

Date of last modification: 15.07.2022

University: P. J	University: P. J. Šafárik University in Košice				
Faculty: Facult	y of Science				
Course ID: KP IIŠP/21	Course name: Integration and Inclusion in School Practice				
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of EC'	<b>FS credits:</b> 2				
Recommended	semester/trimes	ster of the cours	e: 3.		
Course level: I.					
Prerequisities:	Prerequisities:				
Conditions for course completion:					
Learning outcomes:					
Brief outline of the course:					
Recommended literature:					
Course language:					
Notes:					
Course assessment Total number of assessed students: 114					
А	В	С	D	Е	FX
50.0	35.09	8.77	4.39	0.88	0.88
Provides: PaedDr. Michal Novocký, PhD., Mgr. Zuzana Vagaská, PhD.					
Date of last mo	Date of last modification: 14.09.2024				
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					

<b>University:</b> P. J. Šafárik	University	/ in	Košice
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Faculty: Faculty of Science

**Course ID:** ÚCHV/ **Course name:** Introduction to Environmental Chemistry UECH/08

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

Course method: present

**Number of ECTS credits: 5** 

Recommended semester/trimester of the course: 3., 4..

Course level: I.

Prerequisities:

#### **Conditions for course completion:**

Continuous test. Active participation in exercises - elaboration of semester work. Passing the final examination in the form of a written test.

#### Learning outcomes:

Introduction to topics in environmental chemistry and basic procedures applied for environmental protection. Discusses current and future environmental problems and possibilities how to solve them from chemichal point of view.

#### Brief outline of the course:

Introduction to Environmental Chemistry

Chemical aspects of pollution and environmental problems. Composition and behavior of the atmosphere. Energy balance of the Earth and climate changes. Principles of photochemistry, photoprocesses in the atmosphere. Petroleum, hydrocarbons and coal (characteristics, sources and environmental pollution). Soaps, polymers and synthetic surfactants. Haloorganics and pesticides. Environmental chemistry of some important elements (C, N, S, P, halogens, biologically important metals ...). Environmental chemistry in aqueous media. Aqueous systems, parameters, cycles and their protection. The Earth's crust (rocks, minerals, soils). Natural and artificial radioactivity, utilization. Energy and energy sources (fossil fuels, nuclear, geothermal, solar energy, wind and water energy). Solid waste disposal and recycling.

#### **Recommended literature:**

1. Gary W. van Loon, Stephen J. Duffy : Environmental Chemistry - A Global Perspective, Oxford University Press, Oxford 2003

2. R.A. Bailey, H.M. Clark, J.P. Ferris, S. Krause, R.L. Strong : Chemistry of the Environment, Academic Press, San Diego 2002

3. G. Schwedt: The Essential Guide to Environmental Chemistry, Wiley and Sons, London 2001

4. R.N. Reeve, J.D. Barnes: General Environmental Chemistry, Wiley, London 1994

5. G. Burton, J. Holman, G. Pilling, D. Waddington: Chemical Storylines, Heinemann, Oxford, London 1994

6. www

#### **Course language:**

## Notes:

Based on the current pandemic situation in Slovakia and in accordance with the conditions of the Faculty of Natural Sciences of UPJŠ in Košice, the education and examination can also be carried out in a distance form. The tutorial will be carried out in the form of online lectures and consultings in the BigBlueButton system. The written form of the exam takes place through the Google Forms app. Students prepare responses to the final written test. Test questions are randomly generated each time. The final oral exam is conducted through a webinar in BigBlueButton https://bbb.science.upjs.sk/b) system with online generation of random question numbers.

n

0.0

## Course assessment

Total number of assessed students: 1

abs

100.0

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

Date of last modification: 18.07.2022

University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of S	cience			
Course ID: Dek. PF UPJŠ/USPV/13	Course ID: Dek. PF Course name: Introduction to Study of Sciences JPJŠ/USPV/13			
Course type, scope a Course type: Lectur Recommended cour Per week: Per stud Course method: pre	nd the method: re / Practice rse-load (hours): y period: 12s / 3d esent			
Number of ECTS cr	edits: 2			
Recommended seme	ster/trimester of the cour	se: 1.		
Course level: I.	Course level: I.			
Prerequisities:				
Conditions for course completion:				
Learning outcomes:				
Brief outline of the c	ourse:			
Recommended literature:				
Course language:				
Notes:				
Course assessment Total number of asses	ssed students: 2369			
	abs	n		
	90.12 9.88			
Provides: doc. RNDr	. Marián Kireš, PhD.	·		
Date of last modifica	tion: 30.08.2022			
Approved: prof. RNI	Dr. Vladimír Zeleňák, DrSc	., prof. RNDr. Stanislav Krajči, PhD.		

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ UUI/23	Course name: Introduction to artificial intelligence
Course type, scope a Course type: Practi Recommended cou Per week: 2 Per stu Course method: pro	and the method: ce rse-load (hours): ady period: 28 esent
Number of ECTS cr	edits: 3
Recommended seme	ester/trimester of the course:
Course level: I.	
Prerequisities:	
Conditions for course 1. Participation in ex 2. Take the Elements 3. Write an essay on 4. Develop and prese	se completion: ercises (max. 3 absences per semester) of AI course (with certificate) the given topic (min. 50% points) ent a AI implementation proposal project (min. 50% points)
After completing the - To identify the basi - Characterize basic - Critically analyze t - Discuss the ethical, - Propose the possib everyday life	course, students can c application areas of the use of AI nowadays AI tools and procedures he acquired knowledge, reevaluate it and use it in practice legal and social aspects of using AI bilities of using AI in the chosen field of science, research, industry, art or
<ul> <li>Brief outline of the of</li> <li>1. First encounter with of AI</li> <li>2. UI tools and proced</li> <li>3. Machine learning</li> <li>4. Neural networks</li> <li>5. Robotics and AI</li> <li>6. AI around us</li> <li>7. AI in art and enter</li> <li>8. Chatbots and lingu</li> <li>9. Ethical, legal and</li> <li>10. Design Thinking</li> <li>11. Projects presenta</li> </ul>	h artificial intelligence - what is and what is not AI, basic terminology, domains dures tainment istic models social applications of AI exercises: AI implementation design project tions
Recommended litera Elements of AI (http	ature: s://course.elementsofai.com/)

Microsoft Azure AI fundamentals: get started with artificial intelligence (https:// learn.microsoft.com/sk-sk/training/paths/get-started-with-artificial-intelligence-on-azure/? wt.mc id=academic-77998-cacaste) People + AI guidebook (https://pair.withgoogle.com/guidebook/) Fan, S.: will AI replace us? A primer for the 21st century. Thames&Hudson, 2019. ISBN 978-0-500-29457-4 Using AI for social good (https://ai.google/education/social-good-guide/) Europe's approach to artificial intelligence: how AI strategy is evolving (https:// www.accessnow.org/cms/assets/uploads/2020/12/europes-approach-to-ai-strategy-isevolving.pdf) The essential AI handbook for leaders (https://peltarion.com/peltarions-essential-ai-handbookfor-leaders.pdf) **Course language:** Slovak Notes: **Course assessment** Total number of assessed students: 22 В С D Е FX Α 100.0 0.0 0.0 0.0 0.0 0.0 Provides: Ing. Zuzana Tkáčová, Ing.Paed.IGIP.

Date of last modification: 07.03.2023

University: P. J. Šafá	irik University in Košice			
Faculty: Faculty of S	Science			
<b>Course ID:</b> ÚINF/ UKN/24	Course name: Introduction to cognitive and neural sciences			
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present				
Number of ECTS cr	edits: 5			
Recommended seme	ester/trimester of the course: 3., 5.			
Course level: I., II., I	N			
Prerequisities:				
<b>Conditions for cours</b> Midterm exam	se completion:			
Learning outcomes: Overview anatomy, computational aspec	physiology, and cognitive processes in the human brain with focus on ts of cognition and computational tools used in neuroscience.			
<ul> <li>Brief outline of the of</li> <li>1. Intro to neural and</li> <li>2. Overview of anato</li> <li>3. Methods of study</li> <li>4. Neuron: anatomy,</li> <li>5. Propagation of sig</li> <li>6. Synaptic transmiss</li> <li>7. Psychology of me</li> <li>8. Vision: Intro. Perositance.</li> <li>9. Hearing and audito</li> <li>10. Language, psych</li> <li>11. Attention.</li> <li>12. Crossmodal inter</li> <li>13. Reasoning and doi:</li> </ul>	course: l cognitive science my and physiology of the central nervous system (CNS) in neuroscience. Sensory, motor and associative brain areas. types, action potential nals in the neuron, neural coding. sion and plasticity - neural basis of learning and memory. mory and learning. ception of brightness, edges, color. Model BCS/FCS. Perception of size and ory cognition. olinguistics, speech perception and production. raction (vision, hearing, touch). ecision making.			
Recommended liter 1. Poeppel D., Mang 2020. ISBN-13: 978 2. Dayan P and LF A Modeling of Neural 3. Thagard P: Mind: <sup>†</sup> 978-0262701099	ature: un G., Gazzaniga M. (ed.): The Cognitive Neurosciences. 6th ed. MIT Press. -0262043250 Abbott: Theoretical Neuroscience - Computational and Mathematical Systems. MIT Press, 2005 ISBN-13: 978-0262541855 Introduction to Cognitive Science, 2nd Edition. Bradford Books. ISBN-13':			
Course language.				

Course language:

Slovak or English					
Notes: Content prerequ Algebra, progra	uisites: amming (Matlab)				
Course assessm Total number o	nent f assessed studen	ts: 9			
А	В	B C D E FX			
44.44	44.44 0.0 11.11 0.0 44.44 0.0				0.0
<b>Provides:</b> doc. Ing. Norbert Kopčo, PhD., univerzitný profesor, Ing. Peter Lokša, PhD., RNDr. Keerthi Kumar Doreswamy, PhD., Ing. Udbhav Singhal, Myroslav Fedorenko					
Date of last mo	dification: 19.03	3.2024			
Approved: prof	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.

University: P. J. Šafa	árik University in Košice		
Faculty: Faculty of S	Science		
<b>Course ID:</b> ÚINF/ UIB1/21	urse ID: ÚINF/       Course name: Introduction to information security         B1/21       B1/21		
Course type, scope a Course type: Lectu Recommended cou Per week: 2 / 2 Per Course method: pr	and the method: are / Practice arse-load (hours): • study period: 28 / 28 resent		
Number of ECTS c	redits: 5		
Recommended sem	ester/trimester of the course: 3.		
Course level: I.			
Prerequisities:			
<b>Conditions for cour</b> The condition for pa Homeworks (30% of number of points), 4	<b>rse completion:</b> assing the course is: 1. Exercise tasks (20% of the total number of points), 2. f the total number of points), 3. Written final theoretical exam (25% of the total w. Written final practical exam (25% of the total number of points).		
<b>Learning outcomes</b> The result of the edu the technical, legal a	: acation is an understanding of the basic concepts of information security from and procedural views of point.		
Brief outline of the 1. Introduction to in management, 3. Risl security, 5. Continu Introduction to cryp resources security ar network security, 12	<b>course:</b> Information security and information security model, 2. Information security is and risk management, 4. Legal, normative and ethical aspects of information ity management of activities, processes and security incidents handling, 6. tology, 7. Access control, 8. Physical and environmental security, 9. Human and social engineering, 10. End point security and malicious code, 11. Computer . Application security, 13. Final exam.		

#### **Recommended literature:**

1. MARTIN, Andrew, Awais RASHID, Steve SCHNEIDER a Howard CHIVERS. CyBOK: The Cyber Security Body of Knowledge. The National Cyber Security Centre, 2021, 2. ANDRESS, Jason, Awais RASHID, Steve SCHNEIDER a Howard CHIVERS. Foundations of Information Security: A Straightforward Introduction. 1. No Starch Press, 2019. ISBN 978-1718500044, 3. PELTIER, Thomas, Awais RASHID, Steve SCHNEIDER a Howard CHIVERS. Information Security Fundamentals. 2. Boca Raton: Auerbach Publications, 2013. ISBN 978-1138436893.

### **Course language:**

Slovak or English

Notes:

Course assessment							
Total number o		18. 160	ſ		r		
A B C D E FX							
44.44	25.0	19.44	6.11	2.22	2.78		
Provides: doc.	Provides: doc. RNDr. JUDr. Pavol Sokol, PhD. et PhD., RNDr. Eva Marková						
Date of last modification: 04.01.2022							
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.							

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	COURSE INFORMATION LETTER
University: P. J. Šafán	rik University in Košice
Faculty: Faculty of Seculty	cience
<b>Course ID:</b> ÚINF/ UNS1/15	Course name: Introduction to neural networks
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 28 esent
Number of ECTS cro	edits: 5
Recommended seme	ster/trimester of the course: 3.
Course level: I., N	
Prerequisities:	
The condition for pas networks, successful types, and genetic alg exam.	ssing the course is the realization of a project with the application of neural completion of two written tests in the field of neural networks, their basic gorithms, as well as successful completion of the written and oral part of the
Learning outcomes: The result of the educa algorithms. The stude analysis and also wor	ation is an understanding of the basic principles of neural networks and genetic ent will gain the ability to apply the acquired knowledge in intelligent data k with a selected tool for modeling neural networks.
<ul> <li>Brief outline of the contrast of the</li></ul>	ourse: ng from biology. Linear threshold units, polynomial threshold units, functions ld units. r separable objects, adaptation process (learning), convergence of perceptron order perceptrons. networks, hidden neurons, adaptation process (learning), backpropagation networks. Hopfield neural networks, properties, associative memory model, ning, optimization problems (business traveler problem). v created network. ART network, architecture, operations, initialization phase, arch and adaptation phase. Use of the ART network.

7. Written test I.

8. Motivation to model genetic elements. Genetic algorithm. Application of genetic algorithms.

9. Genetic programming, root trees, Read's linear code. Basic stochastic optimization algorithms: blind algorithm and climbing algorithm. Forbidden search method.

10. Genetic and evolutionary programming with typing, examples of use. Grammatical evolution.

11. Special techniques of evolutionary computations. Selection mechanisms in evolutionary algorithms.

12. Use of genetic algorithms in training neural networks. Artificial life.

13. Written test II.

# **Recommended literature:**

1. AGGARWAL, Charu C. Neural networks and deep learning: a textbook. Cham: Springer, 2018. ISBN 978-3319944623.

2. KVASNIČKA, Vladimír. Úvod do teórie neurónových sietí. [Slovenská republika]: IRIS, 1997. ISBN 80-88778-30-1.

3. KVASNIČKA, Vladimír. Evolučné algoritmy. Bratislava: Vydavateľstvo STU, 2000. Edícia vysokoškolských učebníc. ISBN 80-227-1377-5.

4. MITCHEL, Melanie. An Introduction to Genetic Algorithms. Cambridge: MIT Press, 2002. ISBN 0-262-63185-7.

5. SINČÁK, Peter, ANDREJKOVÁ, G. Úvod do neurónových sietí, I. diel, Košice: ELFA, 1996. ISBN 808878638X

### **Course language:**

Slovak or English

#### Notes:

Content prerequisites:

Basics of programming in Python, or another alternative programming language suitable for data analysis

#### **Course assessment**

Total number of assessed students: 535

А	В	С	D	Е	FX
24.11	17.01	20.19	16.45	18.69	3.55

Provides: doc. RNDr. Ľubomír Antoni, PhD., RNDr. Šimon Horvát, PhD.

**Date of last modification:** 23.11.2021

University: P. J	. Šafárik Univers	sity in Košice			
Faculty: Facult	y of Science				
Course ID: ÚIN MZI/21	NF/ Course na	ame: Introduction	n to study of info	rmatics	
Course type, sc Course type: I Recommended Per week: 2 / 2 Course metho	ope and the me Lecture / Practice d course-load (h 2 Per study peri d: present	thod: e iours): iod: 28 / 28			
Number of EC	<b>FS credits:</b> 5				
Recommended	semester/trime	ster of the cours	<b>e:</b> 1.		
Course level: I.					
Prerequisities:					
Conditions for Understanding	<b>course complet</b> of basic mathem	ion: atical notions			
Learning outco Understanding	mes: of basic mathem	atical notions			
<ul> <li>Brief outline of</li> <li>1. Mathematica</li> <li>2. Connections</li> <li>3. Classes and s</li> <li>4. Other operand</li> <li>5. Relations</li> <li>6. Relational alg</li> <li>7. Orderings</li> <li>8. Equivalences</li> <li>9. Functions</li> <li>10. Cardinalitie</li> <li>11. Infinities</li> <li>12. Cardinal ari</li> </ul>	the course: I text and quantifiers sets ions operácie gebra s thmetics				
Recommended	literature:	unabo/iccon/pro	dmatx/MZI html		
Course language	sk/~krajci/skola/ ge:	vyucoa/jesen/pre			
Notes:					
Course assessm Total number of	ent f assessed studer	nts: 414			
А	В	C	D	Е	FX
38.16	20.29	13.04	3.86	1.69	22.95
Provides: prof.	RNDr. Stanislav	Krajči, PhD.			

Date of last modification: 23.11.2021

University: P. J. Šafá	University: P. J. Šafárik University in Košice						
Faculty: Faculty of S	Science						
Course ID: ÚMV/ MTI4a/22	Course name: Mathematics I for informaticians						
Course type, scope a Course type: Lectur Recommended cou Per week: 2 / 2 Per Course method: pre	Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present						
Number of ECTS cr	redits: 5						
Recommended seme	ester/trimester of the course: 1.						
Course level: I.							
Prerequisities:	-						

#### **Conditions for course completion:**

Two tests, completion of individual and group homework. Assessment is given on the basis of semestral evaluation and examination test. The ability to solve selected types of problems (without context/with context) also in combination with mathematical software is evaluated. Furthermore, the understanding of concepts and relationships between them (conceptual questions / tasks) is taken into account. A total of 100 points can be obtained (60 points during the semester and 40 points for the exam test). In addition, it is possible to obtain bonus points for various activities (solving bonus tasks, active approach to the subject during the semester ...). A minimum of 25 points (out of a possible 60) and the submission of a sufficient number of individual assignments according to the instructions are required from the semester.

#### Learning outcomes:

To obtain basic mathematical knowledge about the divisibility of integers, congruences, number systems, vectors, matrices and determinants, as well as the functions of one real variable. To get acquainted with the applications (including the information technologies) of some fundamental mathematical concepts. To learn to work with mathematical software and together with the acquired knowledge to use it in solving various types of problems.

### Brief outline of the course:

Introduction to the teaching system, technologies and mathematical software (1 week). Integers and divisibility, prime numbers and congruences, applications of congruences and residue classes - basic properties of integer divisibility, canonical decomposition of a number, greatest common divisor and least common multiple of numbers, Euclidean algorithm, solution of (linear) Diophantine equations and (linear) congruences, addition and subtraction of residue classes (3 weeks). Number systems and conversions between them - positional number systems and conversions between them, arithmetic operations in different number systems (1 week). Vectors, matrices, determinants, their applications and introduction to analytical geometry - vector and matrix operations, scalar and vector product, angles of vectors, calculation of matrix determinants (from definition, Saruss rule, row/column expansion), inverse matrix determination (using determinant and adjoint matrix, Gaussian-Jordan method), solution of linear systems equations (Gaussian elimination method, Cramer's rule, substitution/addition method), eigenvalues/eigenvectors of a matrix (3 weeks). Introduction to (elementary) functions - domains and graphs of functions, basic properties of

functions (boundedness, monotonicity, parity, periodicity), operations with functions, inverse function, basic properties of elementary functions (polynomial, power, exponential, logarithmic, trigonometric, cyclometric) (2 weeks).

# **Recommended literature:**

Hallet D. H. (2014). Applied Calculus. John Wiley & Sons.

Koshy T. (2007). Elementary Number Theory with Applications. Elsevier.

Judson T. W., Austin S. F. (2019). Abstract Algebra: Theory and Applications. GNU Free Documentation License.

Lay D. C. (2012). Linear Algebra And Its Applications. Boston: Addison-Wesley.

Studenovská D., Madaras T. (2006). Matematika pre nematematické odbory. UPJŠ.

Studenovská D., Madaras T., Mockovciak S. (2006). Zbierka úloh z matematiky pre nematematické odbory. UPJŠ.

Zimmermann P. et al. (2018). Computational Mathematics with SageMath. Springer.

## Course language:

Slovak

Notes:

## **Course assessment**

Total number of assessed students: 92

А	В	С	D	Е	FX
7.61	4.35	14.13	33.7	30.43	9.78

Provides: RNDr. Andrej Gajdoš, PhD., RNDr. Stanislav Basarik, PhD.

**Date of last modification:** 18.03.2024

# HDGE INFODMATION I ETTE

	COURSE INFORMATION LETTER
University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚMV/ MTI4b/22	Course name: Mathematics II for informaticians
Course type, scope a Course type: Lectu Recommended cou Per week: 2 / 2 Per Course method: pro	ind the method: re / Practice rse-load (hours): study period: 28 / 28 esent
Number of ECTS cr	redits: 5
Recommended seme	ester/trimester of the course: 2.
Course level: I.	
Prerequisities: ÚMV	7/MTI4a/22
Two tests, completion on the basis of seme problems (without c evaluated. Furthermo questions / tasks) is the semester and 40 various activities (so minimum of 25 point assignments accordin	n of individual and group homework during the semester. Assessment is given estral evaluation and examination test. The ability to solve selected types of ontext / with context ) also in combination with mathematical software is ore, the understanding of concepts and relationships between them (conceptual taken into account. A total of 100 points can be obtained (60 points during points for the exam test). In addition, it is possible to obtain bonus points for diving bonus tasks, active approach to the subject during the semester). A is (out of a possible 60) and the submission of a sufficient number of individual ng to the instructions are required from the semester.
<b>Learning outcomes:</b> Gain basic knowledg get acquainted with t	ge of differential and integral calculus of functions of one real variable. Also he functions of several (mostly two) variables.
Brief outline of the of Differential calculus of functions, applicat real variable - primiti improper integrals (1 function limits, partia	course: of functions of one real variable - limits and continuity of functions, derivatives ions of derivatives of functions (4 weeks). Integral calculus of functions of one ve function, substitution method, per partes, applications of a definite integral, 3 weeks). Functions of several (two) variables - domains and visualization, al derivatives, determination of (local) extremes of functions (3 weeks).
Boelkins M., Austin Hallet D. H. et al. (20 Hallet D. H. (2014). Hallet D. H. et al. (20 Hartman G. et al. (20	D., Schlicker S. (2018). Active Calculus. 978-1085940856. 012). Calculus: Single & Multivariable Variable. Wiley. Applied Calculus. John Wiley & Sons. 017). Calculus: Single Variable. Wiley. 018). APEX Calculus. 978-1514225158.

Schlicker S., Austin D., Boelkins M. (2018). Active Calculus - Multivariable. 978-1548655525. D. Studenovská, T. Madaras, S. Mockovčiak: Zbierka úloh z matematiky pre nematematické odbory, UPJŠ 2006

D. Studenovská, T. Madaras: Matematika pre nematematické odbory, UPJŠ 2006

Course language: Slovak						
Notes:						
Course assessment Total number of assessed students: 51						
А	В	С	D	Е	FX	
9.8	11.76	19.61	39.22	17.65	1.96	
Provides: RNDr. Andrej Gajdoš, PhD., RNDr. Stanislav Basarik, PhD.						
Date of last modification: 18.03.2024						
Approved: prof	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.	

University: P. J.	. Šafárik Univers	ity in Košice			
Faculty: Faculty	y of Science				
<b>Course ID:</b> KPI MKŠP/21	PE/ Course name: Mentoring and Coaching in School Practice				
Course type, sc Course type: H Recommended Per week: 2 Pe Course metho	ope and the met Practice I course-load (h er study period: d: present	thod: ours): 28			
Number of EC	<b>FS credits:</b> 2				
Recommended	semester/trimes	ster of the cours	<b>e:</b> 5.		
Course level: I.					
Prerequisities:					
Conditions for	course completi	on:			
Learning outco	mes:				
Brief outline of	the course:				
Recommended	literature:				
Course languag	ge:				
Notes:					
Course assessm Total number of	ent f assessed studen	ts: 85			
А	В	С	D	Е	FX
88.24 9.41 2.35 0.0 0.0 0.0					
Provides: Mgr. Zuzana Vagaská, PhD., Mgr. Beáta Sakalová, PhD.					
Date of last mo	dification: 18.09	9.2024			
Approved: prof	. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.

University: P. J	. Šafárik Univers	ity in Košice			
Faculty: Facult	y of Science				
Course ID: KP MMKV/17	se ID: KPE/ Course name: Multiculturalism and Multicultural Education				
Course type, sc Course type: I Recommended Per week: 2 Pe Course metho	ope and the met Practice d course-load (h er study period: d: present	thod: ours): 28			
Number of EC	<b>FS credits:</b> 2				
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4.		
Course level: I.					
Prerequisities:					
<b>Conditions for</b>	course completi	on:			
Learning outco	mes:				
Brief outline of	the course:				
Recommended	literature:				
Course languag	ge:				
Notes:					
Course assessm Total number of	<b>ent</b> f assessed studen	ts: 251			
А	В	С	D	Е	FX
40.64 41.43 16.33 0.8 0.4 0.4					
Provides: PaedDr. Michal Novocký, PhD.					
Date of last mo	dification: 12.03	3.2024			
Approved: prof	. RNDr. Vladimí	ír Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.

University: P. J. Šafár	University: P. J. Šafárik University in Košice					
Faculty: Faculty of Sc	vience					
Course ID: ÚINF/ OSY/24	Course name: Operating systems					
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present						
Number of ECTS cre	edits: 4					
Recommended semes	ster/trimester of the course: 3.					
Course level: I.						
Prerequisities: ÚINF/	/PRP2/15					
<b>Conditions for course</b> Oral exam	e completion:					
Student obtains base I their structure and con of the life cycle of pro knowledge of physica as well as phenomena student to understand intervene with running	cnowledge about the properties and internal processes of operating systems, cept. By completing the course, the student will gain a comprehensive picture ocesses, their planning and communication between them. He will also gets a al, logical and virtual memory management and understands synchronization a such as deadlocks or starvation. The acquired knowledge will enable the the behavior of the operating system, which leads to gaining the ability to g operating system, eventually optimize it.					
Brief outline of the co 1. History, developme 2. Kernel of the opera 3. Process - definition 4. Process - planning a 5. Process - inter-proc 6. Thread - definition, 7. Synchronization of 8. Deadlock and starva 9. Memory - definition 10. Memory - allocation 11. Memory - MMU, 12. Memory - virtual of 13. File system - definition 14. File system - file,	nt, user interface and structure of operating systems. ting system and system calls, implementation. , structure, life cycle, implementation. algorithms, multiprocessing. ess communication. , structure, life cycle, implementation. processes and system resources. ation - prevention, detection, recovery. n, types of memories, usage, volatility, DMA. on strategies, paging, fragmentation. TLB, MPU, segmentation. TLB, MPU, segmentation. memory management strategies. nition, structure, implementation. directory, attributes, access control, ACL.					
Recommended literat 1. SILBERSCHATZ, 10th Revised edition. 2. TANENBAUM, Ar Pearson Education Lit	ture: Abraham, Peter B. GALVIN a Greg GAGNE. Operating System Concepts. New York, United States: John Wiley, 2021. ISBN 9781119800361. ndrew, Herbert BOS. Modern Operating Systems. 4th edition. London, UK: mited, 2014. ISBN 9781292061429.					

3. The Linux Kernel documentation. Linux Kernel Library [online]. Dostupné z: https:// www.kernel.org/doc/html/latest/

4. DOWNEY, Ällen B. The Little Book of Semaphores [online]. Version 2.2.1. Green Tea Press, 2016. Dostupné z: https://greenteapress.com/semaphores/LittleBookOfSemaphores.pdf

1	1 0	1	1	1	1		
Course language: Slovak or English							
Notes:	Notes:						
Course assessment Total number of assessed students: 93							
А	В	С	D	Е	FX		
22.58	15.05	24.73	21.51	15.05	1.08		
Provides: RNDr. PhDr. Peter Pisarčík, doc. RNDr. JUDr. Pavol Sokol, PhD. et PhD.							
Date of last modification: 19.03.2024							
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

Faculty: Faculty of Science

Course ID: ÚCHV/ Course name: Organic chemistry OCHU/21

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

Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: I.

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

#### **Conditions for course completion:**

Written test. Two tests, in 7th and 14th week. Test max 50 points. A student must obtain at least 51% of points. Writing of the tests is mandatory.

Written exam, 100 points. 69 Theoretical questions (69 points), 62 chemical formulas (31 points). A student must obtain at least 51% of points. Final evaluation: A 91-100 pts, B 81-90 pts, C 71-80 pts, D 61-70 pts, E 51-60 pts, FX 0-50 pts.

#### Learning outcomes:

Basic organic chemistry course.

Nomenclature of organic compounds, their chemical properties, structure, reactivity and characteristic reactions. Preparation of organic molecules, explanation of the basic mechanisms and principles of organic reactions.

After completing the subject, the student understands the studied theories, principles, methods and logical procedures of organic chemistry. He has knowledge of modern organic chemistry with an emphasis on the current development of knowledge in the aforementioned area.

#### **Brief outline of the course:**

Chemical bonding Hybridization and Bonding Covalent bonds Double bonds and Triple Bonds Structural Formulas of Organic Molecules Polar Covalent Bonds and Electronegativity Constitutional Isomers Alkenes Electrophilic Additions Strong Brønsted Acids Lewis Acids (non-Proton Electrophiles) Electrophilic Halogen Reagents Other Electrophilic Reagents Reduction Oxidation Radical Additions Allylic Substitution Alkynes Addition Reactions Hydrogenation Electrophiles Hydration & Tautomerism Hydroboration Nucleophilie Addition & Reduction Acidity of Terminal Alkynes (Substitution of H) Alkyl Halides General Reactivity Substitution(of X) SN2 Mechanism SN1 Mechanism Elimination (of HX) Summary of Substitution vs. Elimination Substitution by Metals Elimination Reactions of Dihalides Alcohols Reactions of Alcohols Substitution of the Hydroxyl H Substitution of the Hydroxyl Group Elimination of Water Oxidation to Quinones Aromatic compounds Electrophilic Substitution A Substitution Mechanism Reactions of Substituted Benzenes Reaction Characteristics Reactions of Disubstituted Rings Reactions of Substituent Groups Nucleophilic Substitution, Elimination & Addition Reactions Amines Basicity of Nitrogen Compounds Acidity of Nitrogen Compounds Important Reagent Bases Reactions of Amines Electrophilic Substitution at Nitrogen Preparation of 1°-Amines Preparation of 2° & 3°-Amines Reactions with Nitrous Acid Reactions of Aryl Diazonium Intermediates Elimination Reactions of Amines Oxidation States of Nitrogen Basic information: Aldehydes & Ketones Carboxylic Acids Derivatives of Carboxylic acids Natural products

#### **Recommended literature:**

1. Organic chemistry, J. Clayden, N. Greeves Warren, S. Wothers, Oxford University Press, 2012, ISBN 978-0-19-92-7029-3.

2. Organic chemistry, J. E. McMurry, Brooks/Cole, a Thomson Learning Company 2004, Sixth Eddition, ISBN 0534389996.

3. Organic chemistry, P. Zahradník, M. Mečiarová, P. Magdolen, Univerzita Komenského v Bratislave, 2019, ISBN: 978-80-223-4589-7.

#### **Course language:**

anglický

#### Notes:

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

#### Course assessment

Total number of assessed students: 84

А	В	С	D	Е	FX
11.9	9.52	22.62	41.67	13.1	1.19

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

**Date of last modification:** 04.08.2022

University	$\mathbf{p}$	I Šafárik	University	in Košice
University.	Г. Ј	J. Salalik		III KUSICE

Faculty: Faculty of Science

**Course ID:** ÚCHV/ **Course name:** Organic chemistry - Lab. POCHU/15

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

Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities: ÚCHV/OCHU/03 or ÚCHV/OCHU/21

#### **Conditions for course completion:**

100% participations in practical exercises.

Two written tests 2 x 25 pts (a minimum of 13 points must be obtained in each test), twelve reports 12 x 2 pts, laboratory skills 12 pts, short quizzes and questions 14 pts.

A 100 pts. in total.

Assessment A: 91-100; B: 81-90; C: 71-80; D: 60-71; E: 51-60; FX: 0-50 pts.

#### Learning outcomes:

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

#### **Brief outline of the course:**

Preparation, isolation, purification and identification of organic compounds. The emphasis is on gaining the experimental skills in synthesis of organic compounds, distillation, extraction, crystallization, sublimation and thin-layer chromatography.

- 1. Isolation and purification methods crystallization
- 2. Isolation and purification methods distillation
- 3. Preparation of ethyl acetate
- 4. Preparation of acetylsalicylic acid
- 5. Preparation of benzalaniline
- 6. Spectral methods in organic chemistry
- 7. Preparation of acetophenone oxime
- 8. Preparation of benzilic acid
- 9. Preparation of 4,5-diphenylimidazole
- 10. Isolation of caffeine from tea
- 11. Isolation of trimyristin from nutmeg

#### **Recommended literature:**

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

**Course language:** 

Slovak
Notes:

Notes:								
Course assessment								
Total number of	Total number of assessed students: 274							
A B C D E FX								
55.84 27.37 10.58 5.47 0.73 0.0								
<b>Provides:</b> RNDr. Slávka Hamul'aková, PhD., univerzitná docentka, RNDr. Ján Elečko, PhD., RNDr. Jana Špaková Raschmanová, PhD., doc. RNDr. Mariana Budovská, PhD., RNDr. Kvetoslava Stanková, PhD., RNDr. Martin Fábian, PhD.								
Date of last modification: 28.01.2022								
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.								

University: P. J.	Šafárik	University	in Košice
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Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Organická chémia II
OCH1b/21	

Course type, scope and the method: Course type: Lecture / Practice

Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28

Course method: present

Number of ECTS credits: 5

**Recommended semester/trimester of the course: 3., 5.** 

Course level: I.

Prerequisities:

### **Conditions for course completion:**

Written test. Two tests, in 7th and 14th week. Test max 50 points. A student must obtain at least 51% of points from each test. Writing of the tests is mandatory.

Written exam, 100 points. 69 Theoretical questions (69 points), 62 chemical formulas (31 points). A student must obtain at least 51% of points. Final evaluation: A 91-100 pts, B 81-90 pts, C 71-80 pts, D 61-70 pts, E 51-60 pts, FX 0-50 pts.

### Learning outcomes:

The advanced organic chemistry. The structure, reactivity and synthesis of organic compounds with careful explanations of difficult concepts and reaction mechanisms.

After completing the subject, the student has deeper knowledge of organic chemistry, knows how to connect the properties of organic compounds with their structure and reactivity. He can explain the principles of the mechanisms of organic reactions and propose syntheses of various groups of organic compounds (also multi-stage).

The student understands the studied theories, principles, methods and logical procedures of advanced organic chemistry. He has knowledge of modern trends in the field of organic chemistry with an emphasis on the current development of knowledge in the aforementioned field.

### Brief outline of the course:

Ethers - their nomenclature, preparation and reactions. Sigmatropic rearrangements, their selectivity. Preparation and reactions of epoxides.

Nitrogen compounds, Amines, their nomenclature, basicity and nucleophilicity, preparation amines, their reactions. Diazonium salts, their preparation and reactions. Nitro compounds, their preparation and reactions. Nitroso compounds, oximes, hydrazones, nitroaldol reaction.

Carbonyl compounds - aldehydes and ketones, their nomenclature and reactivity. Nucleophilic additions, addition of the primary and secondary amines and related nitrogen reagents, the aldol reaction, self-condensations, cross-condensations and related reactions. Claisen condensation and its variants. Alkylation of enolates and their applications. Benzilic acid rearrangement, Benzoin condensation, Cannizzaro reaction, Mannich reaction, Reformatsky reaction, Perkin synthesis, Knoevenagel condensation, Julia olefination, Julia-Kocienski and Petersen olefination, Wittig reaction, HWE olefination, Baylis-Hillman reaction, Darzens reaction, Baeyer-Villiger oxidation, conjugate addition, Michael addition (Michael's donors and acceptors), Robinson annulation.

Carboxylic acids, their nomenclature, properties and preparation. Reactions of carboxylic acids, Esterification. Carboxylic acid derivatives (acyl halides, anhydrides, esters, amides, – their nomenclature, properties, preparation and reactions).  $\beta$ -Oxoesters – their preparation and reactions. Acyloin condensation, Arndt-Eistert synthesis, Hofmann degradation, Lossen degradation, Curtius rearrangement, Wolff rearrangement.

Amino acids – their stereochemistry, properties, preparation and reactions, peptide bond - its structure, synthesis of peptides, the protective groups for amino acids.

Saccharides - classification, their nomenclature and stereochemistry. Fischer and Haworth projection, conformation of saccharides, reaction of saccharides (oxidation, reduction, production of the glycosidic bond). The protective groups. Oligosaccharides, polysaccharides.

Nucleotides and nucleic acids (structure of nucleoside, saccharides in NA, purine and pyrimidine bases in NA). Examples of nucleotides in RNA and DNA.

Heterocyclic compounds. Five and six membered heterocyclic compounds.

Terpenes, stereoids and alkaloids - their classification and properties.

## **Recommended literature:**

Recommended literature:

1. J. Clayden, N. Greeves, S. Warren, P. Wothers: Organic Chemistry, Oxford University Press, 2012.

2. Solomons T.W. Graham: Solomon's Organic Chemistry, Willey&Sons Inc., 2017.

3. J. E. McMurry: Organic Chemistry, Vysoké učení technické v Brne, 2007, VUTIUM, ISBN: 978-80-214-3291-8 (VUT v Brne).

4. J. E. McMurry: Organic Chemistry, Cengage, 2015.

# **Course language:**

english

## Notes:

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

### **Course assessment**

Total number of assessed students: 45

А	В	С	D	Е	FX
15.56	13.33	17.78	22.22	26.67	4.44

Provides: doc. RNDr. Miroslava Martinková, PhD., univerzitná profesorka

**Date of last modification:** 04.08.2022

University: P. J.	University: P. J. Šafárik University in Košice							
Faculty: Faculty	of Science							
Course ID: KPE/ Pg/15Course name: Pedagogy								
Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present								
Number of EC	IS credits: 2							
Recommended	semester/trimes	ster of the cours	e: 3.					
Course level: I.								
Prerequisities:								
Conditions for course completion:								
Learning outcomes:								
Brief outline of	the course:							
Recommended	literature:							
Course languag	je:							
Notes:								
Course assessment Total number of assessed students: 1331								
A B C D E FX								
21.79 30.65 23.44 13.45 8.41 2.25								
Provides: PaedDr. Michal Novocký, PhD., doc. PaedDr. Renáta Orosová, PhD.								
Date of last modification: 14.09.2024								
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.								

Faculty: Faculty of Science

**Course ID:** ÚCHV/ **Course name:** Physical Chemistry FCHU/22

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 3 / 2 Per study period: 42 / 28

**Course method:** present

Number of ECTS credits: 6

#### Recommended semester/trimester of the course: 4.

Course level: I.

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

#### **Conditions for course completion:**

Active participation in seminars. Two partial tests from computational seminars, each must be mastered at A-E. In the case of distance learning, it is necessary to prepare 2 assignments, each must be mastered at 80%.

Examination, unerstanding of three thematic areas of the subject (thermodynamics, electrochemistry, kinetics), must be mastered at A-E.

#### Learning outcomes:

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

#### Brief outline of the course:

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

#### **Recommended literature:**

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

#### **Course language:**

#### Notes:

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

### **Course assessment**

Total number of assessed students: 43

А	В	С	D	Е	FX
30.23	11.63	20.93	18.6	11.63	6.98

**Provides:** prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Ivana Šišoláková, PhD., univerzitná docentka, RNDr. Radka Gorejová, PhD., RNDr. Jana Shepa, PhD.

Date of last modification: 22.07.2022
University: P. J. Safári	k Universitv	in Košice
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Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Physical Chemistry II
FCH1b/10	

**Course type, scope and the method: Course type:** Lecture / Practice

**Recommended course-load (hours): Per week:** 3 / 2 **Per study period:** 42 / 28

Course method: present

Number of ECTS credits: 6

### Recommended semester/trimester of the course: 4., 6.

Course level: I.

Prerequisities: ÚCHV/FCH1a/03 or ÚCHV/FCH1a/21 or ÚCHV/FCHU/10

### **Conditions for course completion:**

1. Participation in seminars (also applies to the online form of teaching). Students are required to attend seminars. The relevant teacher who leads the seminar will justify the reasoned absence of the student (incapacity for work, family reasons, etc.) in a maximum of two seminars during the semester without the need for replacement. In the event of a longer-term reasoned absence (for example due to incapacity for work), the relevant teacher will provide the student with an alternative form of mastering the missed material.

2. Activity at seminars. The preparation of students and their regular monitoring is always assessed by the relevant teacher who conducts the seminar, within his/her competence.

3. Two tests from computational exercises, usually in the 6th and 12th week of the semester. To successfully pass each test, it is necessary to obtain at least 8 points (out of 15 points). Successful completion of continuous tests is a condition of admission to the oral exam.

4. The exam is observed in a regular oral form, resp. in case of restrictions of contact forms of the pedagogical process, the exam is performed by a suitable distance - electronic form.

5. To successfully master the subject, it is necessary to prove mastery of the required curriculum at least 51%.

### Learning outcomes:

Students will gain knowledge about the principles that govern the speed of chemical processes, the kinetics and mechanism of some selected reactions, the balance and kinetics of electrode processes. They will also learn the basics of electrochemistry and catalysis.

### Brief outline of the course:

Electrochemistry. Equilibrium homogeneous processesn electrolyte solutions. Charge transfer in electrolyte solutions. Nonequilibrium homogeneous processes. Transport processes in electrolyte solutions. Conductance and molar conductivity. Hindering effects. Transport numbers. Equilibrium in heterogeneous electrochemical systems. Pocesses on charged interfaces. Electrochemical cells and fuel cells. Classification of electrode types. Concentration cells. Electrolysis. Electrochemical power sources. Potentiometry. Electrical double layer. Surface tension.

Chemical kinetics. Homogeneous processes. Reaction rate. Reaction order. Classification of chemical reactions. Elementary chemical reactions. Mechanism and kinetics equations of complicated chemical processes. Methods of rate low determination. Theory of chemical kinetics.

Ttemperature dependence of reaction rates. Collision theory. Activated complex theory. Chain reactions. Structure and rate lows of chain reactions. Explosion. Polymerisation reactions. Photochemical reactions. Catalysis. Theory of homogeneous catalysis. Chemical oscillation reactions. Heterogeneous processes. Difusion. Physical and chemical adsorption. Adsorption and diffusion. Processes in heterogeneous electrochemical systems. Electrode kinetics, activation and diffusive mechanism of charge transfer.

Application of theoretical relationships on the solving of concrete problems and on the calculation of examples during seminars.

#### **Recommended literature:**

T. Engel, P. Reid : Physical Chemistry, Pearson Educat. Inc., San Francisco 2006 P.W. Atkins : Physical Chemistry,Oxford University Presss, Oxford 1986, 1990, 1994, 1998 W.J. Moore : Physical Chemistry,Longman, London 1972 and newer editions

#### **Course language:**

Slovak language

#### Notes:

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

#### Course assessment

Total number of assessed students: 623

А	В	С	D	Е	FX
15.41	18.62	22.47	18.46	21.35	3.69

**Provides:** prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Jana Shepa, PhD., RNDr. Radka Gorejová, PhD., RNDr. Viktória Čákyová, Mgr. Mária Paračková

Date of last modification: 25.11.2021

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
<b>Course ID:</b> ÚFV/ FPCh/21	Course name: Physics for Chemists
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 28 esent
Number of ECTS cr	edits: 5
Recommended seme	ster/trimester of the course: 1.
Course level: I.	
Prerequisities:	
Conditions for cours Two written examina problems. Oral exam where stuc	<b>e completion:</b> tions during the semester, where students apply the new knowledge by solving lents present theoretical knowledge of the thematic areas listed in the syllabus.
Learning outcomes: Completing the cou understand their relat	rse students will get knowledge of fundamental physical laws and will ion to chemistry.
<ol> <li>Kinematics of a point of the end of the en</li></ol>	<ul> <li>int mass.</li> <li>aneous velocity, 1D and 3D.</li> <li>pint mass (free fall, angled shot).</li> <li>n a circle.</li> <li>ss point I.</li> <li>lications. Different types of forces. Friction.</li> <li>ss point II.</li> <li>field, potential energy (gravitational, springs).</li> <li>ation of mechanical energy.</li> <li>ints and rigid bodies I.</li> <li>st impulse theorem.</li> <li>um conservation.</li> <li>ints and rigid bodies II.</li> <li>gular momentum, moment of inertia. 2nd impulse theorem.</li> <li>momentum conservation. Kinetic energy of rotational motion of rigid bodies.</li> </ul>
	D 111

7. Fluid mechan	ics II.							
- Fluid dynamic	S.							
- Continuity equation.								
- Bernoulli equation, applications.								
8. Molecular physics and thermodynamics I. Molecular attructure of substances (composis, Province motion)								
- Amount of sub	stances molar n	ass Avogadro's	law					
- Internal energy	v Temperature ar	id its measureme	nt (Celsius Kel	vin)				
- Heat, heat cap	acity. Latent heat			•				
9. Molecular ph	vsics and thermo	dynamics II.						
- Ideal gas: state	equation, internation	al energy, speed	distribution.					
- I. law of therm	odynamics. Isoth	nermal, adiabatic	and cyclic proc	esses.				
- Heat transfer:	conduction, conv	rection, radiation						
- II. law of them	nodynamics. Ent	ropy.						
- Heat engines,	Carnot cycle.							
IU. Electricity a	nd magnetism I.	Electric field in	tonsity and nota	ntial (voltage)				
- Canacitor can	acity	. Electric field fil	tensity and poter	illiai (voltage).				
- Electric currer	ut Ohm's law Ele	ectrical power K	irchhoff's laws					
11. Electricity a	nd magnetism II.							
- Magnetism. M	agnetic induction	n, Lorentz force.	Ampere's force.	Biot-Savart law.				
- Faraday's law	of electromagnet	ic induction. Ler	z's law.					
12. Modern phy	sics							
- Relativity. Intr	oduction to quan	tum physics.						
- Atomic physic	s. Nuclear physic	cs, applications.	Elementary parti	cles and cosmolog	gy.			
Recommended 1. V. Hajko, J. I 2. Š. Veis, J. Ma Bratislava, 1978 3. P. Čičmanec: 4. R.P. Feynmar Bratislava, 1985 5. V. Hajko a ko	literature: Daniel-Szabó: Zál Iďar, V. Martišov 3. Všeobecná fyzik 1, R.B. Leighton, 5. ol.: Fyzika v príkl	klady fyziky. Vec ič: Všeobecná fy a 2, Elektrina a r M. Sands: Feyn adoch. Alfa, Bra	la, Bratislava, 19 zika 1, Mechani nagnetizmus. Al nanove prednáš tislava, 1983.	980. ka a molekulová f lfa, Bratislava, 198 ky z fyziky 1-5. A	fyzika. Alfa, 80. llfa,			
Course languag	e:							
Slovak language	,							
Notes:								
Course assessm	ent							
Total number of	assessed student	ts: 244						
А	В	С	D	Е	FX			
25.41 21.31 23.36 15.98 13.93 0.0								
Provides: doc. M PhD.	Agr. Gregor Bánd	ó, PhD., RNDr. Z	uzana Jurašekov	vá, PhD., Mgr. An	drej Hovan,			
Date of last mo	dification: 22.09	.2021						

Faculty: Faculty of Science

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

#### **Course type, scope and the method: Course type:** Lecture / Practice

Recommended course-load (hours):

Per week: 2 / 1 Per study period: 28 / 14

Course method: present

**Number of ECTS credits:** 5

Recommended semester/trimester of the course: 6.

Course level: I., II., III.

**Prerequisities:** 

#### **Conditions for course completion:**

Written test in the middle and the end of the semester.

#### Learning outcomes:

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

#### Brief outline of the course:

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

#### **Recommended literature:**

1. F. Rouquerol, J. Rouquerol, K. Sing: Adsorption by powders and porous solids, Academic press, London, UK, 1999

2. S. J. Gregg, K.S.W. Sing: Adsorption, surface area and porosity, Academic Press, London,, UK, 1982.

3. V. Zeleňák: Adsorption and porosity of solid substances, internal study text, PF UPJŠ, 2020.

### **Course language:**

#### Notes:

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

#### **Course assessment**

Total number of assessed students: 104

А	В	С	D	Е	FX	N	Р
77.88	9.62	3.85	0.0	0.0	0.0	0.0	8.65
Provides: prof. RNDr. Vladimír Zeleňák, DrSc.							
Date of last modification: 21.11.2021							

University: P. J. Safarik University in Kosice						
Faculty: Faculty of Science						
Course ID:	Course name: Positive Psychology					
KPPaPZ/PP/15						
Course type, scope a	nd the method:					
Course type: Practic	ce					
Recommended cou	rse-load (hours):					
Per week: 2 Per stu	dy period: 28					
<b>Course method:</b> pre	esent					
Number of ECTS cr	edits: 2					
Recommended seme	ster/trimester of the course: 4., 6.					
Course level: I.						
Prerequisities:						
Conditions for cours	se completion:					
Assessment of Study	Results:					
The evaluation of stu	dy results for the course is conducted through continuous assessment. Active					
participation in semin	nars (a maximum of 2 absences is allowed) accounts for 20%; a presentation					
during the exercises of	on a pre-assigned date accounts for 30%; and the preparation and submission					
of a group year-long	methodological guide on Positive Psychology accounts for 50%.					
Final Grading Scale:						
A: 100 – 90%						
B: 89 – 80%						
C: 79 – 70%						
D: 69 – 60%						
E: 59 – 50%						
FX: 49% or less – $tat$	iled and must revise the assignment where a low score was obtained.cademic					
information system o	I the UPJS.					
Learning outcomes:						
Knowledge: Students	will gain basic knowledge about the origins, foundations, and applications of					
Positive Psychology as a new and dynamically developing field of psychology. They will become						

Positive Psychology as a new and dynamically developing field of psychology. They will become familiar with research in this area and various perspectives on personal well-being, happiness, and life meaning. They will acquire an overview of the main theoretical approaches in Positive Psychology and their application in the context of individuals and society, with an emphasis on their use in educational settings.

Skills: Students will develop the ability to independently and critically address current topics in Positive Psychology, such as positive emotions, interpersonal relationships, hope, optimism, gratitude, and wisdom. They will learn to apply Positive Psychology principles in designing programs aimed at promoting personal well-being and developing positive traits, which can be utilized in working with children and youth in school environments.

Competencies: After completing the course, students will be able to effectively apply the principles of Positive Psychology in educational contexts, such as fostering positive interpersonal relationships and developing optimism and gratitude in students. They will be prepared to

participate in the creation and implementation of programs focused on personal development and mental well-being, contributing to the creation of a positive and supportive school environment.

## Brief outline of the course:

- 1. Different perspectives on well-being nad happiness in psychology
- 2. Main theoretical approaches to positive psychology
- 3. Positive emotions and positivity
- 4. Meaningfulness
- 5. Positive interpersonal relations
- 6. Post-traumatic growth
- 7. Hope and optimism
- 8. Gratitude
- 9. Spirituality as a personality dimension
- 10. Wisdom
- 11. Positive institutions
- 12. New themes and topics in PP

## **Recommended literature:**

Brewer, M. B., & Hewstone, M. (2004). Emotion and motivation. Blackwell.

Deci, E., & Ryan, R. M. (2002). Handbook of self-determination research. Rochester.

Křivohlavý, J. (2003). Pozitivní psychologie. Praha: Portál.

Křivohlavý, J. (2007). Psychologie vděčnosti a nevděčnosti. Praha: Grada.

Křivohlavý, J. (2012). Psychologie moudrosti a dobrého života. Praha: Grada.

Křivohlavý, J. (2013). Psychologie pocitu štěstí. Praha: Grada.

McAdams, D. P. (2002). The person. New York.

Seligman, M. E. P., & Csikszentmihalyi, M. (Eds.). (2000). Positive psychology [Special issue]. American Psychologist, 55(1).

Říčan, P. (2007). Psychologie náboženství a spirituality. Praha: Portál.

Slezáčková, A. (2012). Průvodce pozitivní psychologií. Praha: Grada.

Carr, A. (2022). Positive psychology: The science of wellbeing and human strengths (3rd ed.). Routledge.

# Course language:

Notes:

## Course assessment

Total number of assessed students: 462

А	В	С	D	Е	FX
98.27	1.3	0.22	0.0	0.22	0.0

Provides: doc. Mgr. Gabriel Baník, PhD.

Date of last modification: 04.02.2025

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 2.

Course level: I.

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

Conditions for course completion:

#### Learning outcomes:

Acquisition of practical skills and knowledge necessary for work in a chemical laboratory in the preparation of inorganic and other compounds, in the preparation of solutions, methods of distillation and other basic techniques of work in the laboratory. Students will also be able to perform basic characterization of substances and proof reactions.

#### Brief outline of the course:

The utilization of common laboratory techniques for preparation of elements (H2, O2, Cu, Ni), oxides(CO2, Al2O3·xH2O), nitrides(Mg3N2), acids (HNO3, H3BO3), salts((NH4)2SO4, KMnO4), binary salts(NH4)Fe(SO4)2·12H2O), halides (CuCl, CuCl2·2H2O, CuBr2) and coordination compounds [Cu(NH3)4]SO4·H2O, K3[Al(C2O4)3]·3H2O).

#### **Recommended literature:**

J. Černák, J. Bubanec, M. Dzurillová, V. Zeleňák: Praktikum z anorganickej chémie. UPJŠ Košice, 1999.

Z. Vargová, J. Kuchár: Základné praktikum z anorganickej chémie, UPJŠ, Košice, 2009. Z.Vargova, M.Almáši, J. Kuchár, J.Dinajová: Základné laboratórne cvičenia z anorganickej chémie, ŠafárikPress, 2020.

#### **Course language:**

Notes:

#### **Course assessment**

Total number of assessed students: 661

А	В	С	D	Е	FX
54.16	27.08	13.77	2.57	1.66	0.76

**Provides:** doc. RNDr. Juraj Kuchár, PhD., RNDr. Martin Vavra, PhD., RNDr. Miroslava Matiková Maľarová, PhD., prof. RNDr. Zuzana Vargová, Ph.D.

Date of last modification: 22.07.2022

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Practical in Physical Chemistry
PFCU/22	

Course type, scope and the method: Course type: Practice Recommended course-load (hours):

Per week: 4 Per study period: 56

**Course method:** present

Number of ECTS credits: 4

**Recommended semester/trimester of the course:** 5.

Course level: I.

Prerequisities: ÚCHV/FCHU/21 or ÚCHV/FCHU/22 or ÚCHV/FCHU/10

#### **Conditions for course completion:**

1. Adequate theoretical preparation for individual tasks of experimental practice according to the recommended literature.

2. Passing tasks with relevant results.

- 3. Processing of experimental work results in the form of a protocols and its acceptance.
- 4. Assessment of theoretical knowledges and practical skills.

In the case of distance learning:

1. Elaboration of a paper on a selected topic and its presentation.

2. Theoretical preparation in the form of protocols, where the basic principles of individual tasks are stated.

3. Teaching is realized in blocks without limiting the scope in the alternative term.

#### Learning outcomes:

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

#### **Brief outline of the course:**

Experimental verification of theoretical knowledge on thermodynamics, thermochemistry, chemical equilibria (determination of enthalpy, phase diagrams), colligative properties (cryoscopy, ebulioscopy), adsorption.

Experimental verification of theoretical knowledge on electrochemistry (conductivity, dissociation constants, activity coefficients, electromotive force of galvanic cell, Daniell cell, potentials, polarography) and chemical kinetics (determination of rate constants).

#### **Recommended literature:**

B.P. Levitt: Findlay's Practical Physical Chemistry, Longman, London 1973

W.J. Moore: Physical Chemistry, Longman, London 1972

P.W. Atkins: Physical Chemistry, Oxford University Press, Oxford, New York 2002

#### Course language:

Notes:

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

5							
Course assessment							
Total number o	f assessed studen	ts: 67					
A B C D E FX							
98.51 1.49 0.0 0.0 0.0 0.0							
Provides: RNDr. František Kaľavský, RNDr. Jana Shepa, PhD.							
Date of last modification: 22.07.2022							
Approved: prot	Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J. Šafári	k University in Košice
Faculty: Faculty of Sc	ience
Course ID: ÚINF/ PRP2/15	Course name: Principles of computers
Course type, scope an Course type: Lecture Recommended course Per week: 2 / 1 Per se Course method: pres	d the method: / Practice se-load (hours): tudy period: 28 / 14 ent
Number of ECTS cree	dits: 4
Recommended semest	ter/trimester of the course: 2.
Course level: I.	
Prerequisities:	
<b>Conditions for course</b> Graded activities: assig	completion: gnments, mid semester exam, final exam
<ul> <li>Learning outcomes:</li> <li>Know brief history of Neumann type.</li> <li>Understand relation basic a</li> <li>Learn basics about lo principles of how bas memory.</li> <li>Know principles of of memory access.</li> <li>Get idea of device dr</li> </ul>	of computer, classification and construction principles of computers of von between real numbers, integers and their binary representation as well as be withmetic and logic operations over binary represented numbers. gic gates, combination and sequence circuits and their structure. Understand ic circuits realize arithmetic-logic unit and other parts of computers e.g. communication of processor and other devices via interruptions and direct ivers, device controllers and their functionality.
<ul> <li>Brief outline of the co</li> <li>Computers of von N</li> <li>Encoding of integer</li> <li>Logic functions and</li> <li>Combination circuit</li> <li>Arithmetic logic unit</li> <li>Sequential circuits, 17</li> <li>Machine cycle.</li> <li>Types of instruction</li> <li>Instruction cycle and</li> <li>Memory and memory</li> <li>Memory and memory</li> <li>Communication be</li> <li>interruption in compute</li> <li>and functionality.</li> <li>Portability of prographical adapters, more</li> </ul>	<b>urse:</b> leumannovho type, brief history of computer science. s, real numbers and arithmetic operations. Encoding of symbols. their realization and optimisation. s. Realization of basic functional and control elements on computer circuits. it ant its realization. memory cell, organization of memory matrix, types of memories. and instructions sets. d processing of instructions. ory subsistem. tween processor and peripheral devices. Input output devices, mechanism of er, direct memory access. Functionality of device drivers. Device controllers grams. External and peripheral memories their principles and their use. onitors, printers, digital scanners.

1. STALLINGS, William. Computer Organization and Architecture. Prentice Hall, 2002. ISBN 978-0-13-410161-3.

2. DEMBOWSKI, Klaus. Mistrovství v hardware. Computer Press, 2009. ISBN

978-80-251-2310-2.

3. MINASI, Mark. Velký průvodce hardwarem. Grada, 2002. ISBN 978-80-251-2310-2.

## **Course language:**

Slovak or English

## Notes:

## **Course assessment**

Total number of assessed students: 341

А	В	С	D	Е	FX
28.45	15.54	15.84	13.78	22.29	4.11

Provides: RNDr. PhDr. Peter Pisarčík

Date of last modification: 23.11.2021

University: P. J. Šafa	University: P. J. Šafárik University in Košice				
Faculty: Faculty of S	Science				
<b>Course ID:</b> ÚINF/ PBS/15	Course name: Pro-seminar to bachelor thesis				
Course type, scope a Course type: Practi Recommended cou Per week: 1 Per stu Course method: pr	Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 1 Per study period: 14 Course method: present				
Number of ECTS ci	redits: 1				
Recommended seme	ester/trimester of the course: 4.				
Course level: I.					
Prerequisities:					
<b>Conditions for cour</b> Creating a website a bachelor's thesis assi motivation to select a into the AIS by the t	<b>se completion:</b> bout a bachelor's thesis. Selection of bachelor thesis topic. Presentation of the gnment and its objectives. Preparation of an essay in the extent of 1 page on the a bachelor's thesis. Creation of the bachelor's thesis assignment and its insertion hesis supervisor.				
Learning outcomes: Basic knowledge of requirements for sele the bachelor's thesis	the principles of creation and structure of bachelor's theses. Criteria and ecting an appropriate bachelor thesis topic. Knowledge about the structure of assignment.				
<b>Brief outline of the</b> 1. Principles in creat 2. The presentations 3. The presentations 4. The presentations 5. Bachelor thesis an 6. Assignment of bac 7. Basic types of bac 8. Structure of differ 9. Requirements for 10. External compan 11. Presentation of s 12. Presentation of s 13. Presentation of s	course: ing a final thesis. of bachelor thesis topics by potential supervisors. of bachelor thesis topics by potential supervisors. of bachelor thesis topics by potential supervisors. id its objectives. chelor thesis. chelor theses. ent types of bachelor theses. final bachelor theses. sy final theses. elected topics of final theses. elected topics of final theses. elected topics of final theses.				
Recommended liter 1. STN 01 6910. Rui 2. STN ISO 2145. D 1997. 3. STN ISO 690. Inf references to inform 4. KATUŠČÁK, Dat	ature: les of writing and editing documents. 2011. ocumentation. Numbering of sections and subsections of written documents. formation and documentation. Instructions for creating bibliographic ation sources and their citation. 2012 niel. How to write final and qualification theses. Enigma, 2013				

5. Scientific literature related to the topic of the final thesis according to the recommendation of the thesis supervisor.

Course language: Slovak or English			
Notes:			
Course assessment Total number of assessed students: 389			
abs n			
95.37 4.63			
Provides: RNDr. Miroslav Opiela, PhD., RNDr. Dávid Varga			
Date of last modification: 08.01.2022			
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.			

<b>COURSE INFORMATION LETTER</b>				
University: P. J. Šafárik University in Košice				
Faculty: Faculty of S	cience			
C <b>ourse ID:</b> ÚINF/ SPP1a/15	Course name: Programming environments in schools I			
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 2 Per Course method: pre	nd the method: e / Practice rse-load (hours): study period: 28 / 28 esent			
Number of ECTS cro	edits: 4			
Recommended seme	ster/trimester of the course: 3.			
Course level: I.				
Prerequisities: ÚINF	/PAZ1a/15			
Conditions for cours At least 50 % of the r A minimum of 50 %	e completion: narks in the intermediate assessment marks in the mid-term and end-of-semester practical tests			
Learning outcomes: Ability to implement Ability to design an Formulate and solve	more complex algorithms algorithms in the Python programming language. and program educational software in the Python programming language. school computer science problems.			
Brief outline of the c 1. Introduction to Pyt 2. Simple data types ( 3. Control structures 4. Function definition 5. Import and creation 6. Error types and err	ourse: hon, basic features of Python, syntax. (number, logical type), structured types (string, list, dictionary, set, tuple). (loops, conditional statements, exception management). (parameters, return value), function documentation. n of modules. or condition handling. Exception handling and raising.			

7. Saving data to a file and reading data from a file. Data serializing. Open data and its analysis.

8. Testing the correctness of algorithms (doctest, unittest), test data.

9. Object-oriented programming. Design and implementation of custom classes.

10. Creation of graphical interface of programs.

11. Design criteria, design and programming of educational software.

12. Solving more complex algorithmic problems from real life or school practice using the objectoriented approach and the resources of the Python programming language.

#### **Recommended literature:**

PILGRIM, Mark. Ponořme se do Python(u) 3: Dive into Python 3. 1. Praha: CZ.NIC, c2010, 430 s. CZ.NIC. ISBN 978-80-904248-2-1. Dostupné také z: http://knihy.nic.cz/files/nic/edice/ mark pilgrim dip3 ver3.pdf

SHIPMAN, John W. Tkinter 8.5 reference: a GUI for Python. Socorro, NM 87801: New Mexico Tech Computer Center, 2013. Dostupné také z: https://anzeljg.github.io/rin2/book2/2405/docs/ tkinter/tkinter.pdf

GUNIŠ, Ján, Viera MICHALIČKOVÁ, Martin CÁPAY a Ľubomír ŠNAJDER.

Riešenieproblémov a programovanie. Bratislava: Centrum vedecko-technických informácií SR, 2020.ISBN 978-80-89965-62-5.

HETLAND, Magnus Lie. Beginning Python: from novice to professional. New York: Distributed to the book trade worldwide by Springer-Verlag, c2005. ISBN 1-59059-519-X.

KRNÁČ, Jozef, Miloslava SUDOLSKÁ a Ľudovít TRAJTEĽ. Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika: Učiteľ s kompetenciami programátora. Bratislava: Štátny pedagogický ústav Bratislava, 2010. ISBN 978-80-8118-083-5.

## Course language:

Slovak language, knowledge of English is only required to read Python documentation.

Notes:

# Course assessment

Total number of assessed students: 48

А	В	С	D	Е	FX
27.08	18.75	33.33	8.33	8.33	4.17

Provides: PaedDr. Ján Guniš, PhD., univerzitný docent

Date of last modification: 31.08.2021

Faculty: Faculty of Science

<b>Course ID:</b> ÚINF/	Course name: Programming environments in schools II
SPP1b/22	

## Course type, scope and the method:

**Course type:** Lecture / Practice

Recommended course-load (hours):

Per week: 2 / 2 Per study period: 28 / 28

Course method: present

#### Number of ECTS credits: 4

#### Recommended semester/trimester of the course: 5.

Course level: I., N

**Prerequisities:** ÚINF/SPP1a/15

#### **Conditions for course completion:**

Conditions for ongoing evaluation:

1. Educational software or game programmed in the Scratch environment,

2. A programming etude created for learning of programming in the MIT App Inventor environment.

3. Educational or assistive software programmed in the MIT App Inventor environment.

4. A programmed project using the BBC micro: bit kit.

Conditions for successful completion of the course:

Obtaining at least 50% of points for ongoing assignments.

#### Learning outcomes:

After completing this course, students are able to:

a) get an overview of educational programming environments,

b) acquire programming skills in selected educational programming environments,

c) develop the ability to design and program educational software for devices using their sensors and actuators.

#### Brief outline of the course:

1. Teaching algorithmization and programming in primary and secondary school - objectives, content, textbooks and methodological materials. Algorithmic computer games.

- 2. Programming in the Scratch environment.
- 3. Programming in the Scratch environment.
- 4. Programming in the Scratch environment.
- 5. Programming of mobile devices in the MIT App Inventor environment.
- 6. Programming of mobile devices in the MIT App Inventor environment.
- 7. Programming of mobile devices in the MIT App Inventor environment.
- 8. Programming of mobile devices in the MIT App Inventor environment.
- 9. Programming of mobile devices in the MIT App Inventor environment.
- 10. Programming BBC micro: bit kits in MS MakeCode environment.

11. Programming BBC micro: bit kits in MS MakeCode environment.

12. Overview of educational programming initiatives and development environments.

#### **Recommended literature:**

BELL, Charles A., 2017. Micropython for the internet of things: a beginner's guide to programming with Python on microcontrollers. New York, NY: Springer Science+Business Media. ISBN 9781484231227. GUTSCHANK, Jörg et al., 2019. Coding in STEM Education [online]. Berlin: Science on Stage Deutschland e.V., 76 p. [cited 2021-7-10]. ISBN 978-3-942524-58-2. Available from: https://www.science-on-stage.eu/sites/default/files/material/ coding in stem education en 2nd edition.pdf ŠNAJDER, Ľubomír, Gabriela LOVÁSZOVÁ, Viera MICHALIČKOVÁ and Ján GUNIŠ, 2020. Programovanie mobilných zariadení [online]. Bratislava: Centrum vedecko-technických informácií SR, 300 p. [cited 2020-11-30]. ISBN 978-80-89965-63-2. Available from: https:// registracia.itakademia.sk/media/themes/nip-pmz.pdf WOLBER, David, 2014. App Inventor: Vytvořte si vlastní aplikaci pro Android. Brno: Computer Press. ISBN 978-80-251-4195-3. LOVÁSZOVÁ, Gabriela, Jana GALBAVÁ, Viera PALMÁROVÁ and Monika TOMCSÁNYIOVÁ, 2010. Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika: Malé programovacie jazyky. Bratislava: Štátny pedagogický ústav. ISBN 978-80-8118-066-8. CODE.ORG. Learn today, build a brighter tomorrow. Code.org [online]. [cited 2021-7-13]. Available from: https://code.org/ THE LIFELONG KINDERGARTEN GROUP AT MIT MEDIA LAB. Scratch - Imagine, Program, Share [online]. [cited 2021-7-13]. Available from: https://scratch.mit.edu/ MASSACHUSETTS INSTITUTE OF TECHNOLOGY. MIT App Inventor Explore MIT App Inventor [online]. [cited 2021-7-13]. Available from: http:// appinventor.mit.edu/ MICRO:BIT EDUCATIONAL FOUNDATION. BBC micro:bit [online]. [cited 2021-7-13]. Available from: https://microbit.org/ SPY O.Z. Učíme s Hardvérom [online]. [cited 2021-7-13]. Available from: https:// www.ucimeshardverom.sk/ **Course language:** Slovak or English Notes: By default, teaching is carried out face to face. If this is not possible (eg due to a pandemic),

teaching is provided at a distance through video conferencing programs and LMS.

### Course assessment

Total number of assessed students: 34

А	В	С	D	Е	FX
32.35	20.59	14.71	20.59	2.94	8.82
		1			

Provides: doc. RNDr. Ľubomír Šnajder, PhD.

**Date of last modification:** 08.02.2022

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
<b>Course ID:</b> ÚINF/ PJP/25	Course name: Programming language Python
Course type, scope a Course type: Lectur Recommended cour Per week: 1 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 14 / 28 esent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course: 4.
<b>Course level:</b> I., N	
Prerequisities: ÚINF	P/PAZ1a/15
Conditions for course At least 50 % of the r A minimum of 50 %	e completion: narks in the continuous assessment marks in the mid-term test and the final exam practical test
Learning outcomes: Implement solutions non-trivial algorithm solving. Program in Implement parallel co	to selected problems in Python using available modules. Use and implement is to solve selected problems. Use an object-oriented approach to problem Python in an object-oriented manner using Python specifics. Test programs. computing.
<ol> <li>Brief outline of the c</li> <li>Introduction to the</li> <li>Input, output, fund</li> <li>string formatting.</li> <li>Control structures,</li> <li>Exception handling</li> <li>Working with files</li> <li>binary files. Manipul</li> <li>Object-oriented p</li> <li>philosophy of accessi</li> <li>Object-oriented pro</li> <li>Method overloadir</li> <li>Decorators, memo</li> <li>Code validation (</li> <li>Parallel computitivation program</li> </ol>	ourse: environment, basic features of Python, simple and structured data types. ction definition, lambda function, generator notation, function as parameter, iterating over data structures, context manager. g and exception raising. Philosophy of exceptions in Python. . Serialization and deserialization of data - json and pickle protocol. Text and ation with files. Open data. programming 1. Design of custom classes, special methods, properties, ing methods and attributes. ogramming 2. Comparison and differences with Java. Multiple inheritance. ng. Static methods, abstract classes, data class. ization, modules, packages. debugging), testing (doctest, unittest), test-driven development. ng, processes, process triggering and inter-process communication (shared ).
<b>Recommended litera</b> PILGRIM, Mark, 20	<b>iture:</b> 11. Ponořme se do Pythonu(u) 3 [online]. Praha: CZ.NIC, z. s. p. o. ISBN

PIRNAT, Mike, 2015. How to Make Mistakes in Python [online]. Boston: O'Reilly Media. ISBN 978-1-4919-3447-0. Available at: https://www.dbooks.org/how-to-make-mistakes-in-python-1491934476/

STACK OVERFLOW CONTRIBUTORS, 2018. Python® Notes for Professionals [online]. B.m.: GoalKicker. Available at: https://books.goalkicker.com/PythonBook/ PythonNotesForProfessionals.pdf

ROSEMAN, Mark, 2024. Modern Tk Best Practices [online]. 2024. Available at: https://tkdocs.com/

## **Course language:**

Slovak language, knowledge of English language is only required to read documentation of Python.

## Notes:

## **Course assessment**

Total number of assessed students: 1

А	В	С	D	Е	FX
0.0	0.0	0.0	0.0	100.0	0.0

**Provides:** PaedDr. Ján Guniš, PhD., univerzitný docent, RNDr. Zoltán Szoplák, doc. RNDr. Ľubomír Šnajder, PhD.

Date of last modification: 08.03.2025

University: P. J. Šafá	rik University in Košice
<b>Faculty:</b> Faculty of S	cience
<b>Course ID:</b> ÚINF/ PRS/15	Course name: Programming of robotic kits
Course type, scope a Course type: Practic Recommended cour Per week: 3 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 42 esent
Number of ECTS cr	edits: 3
Recommended seme	ster/trimester of the course: 3.
Course level: I.	
Prerequisities:	
<b>Conditions for cours</b> Evaluation of indeper robotic mini-projects Creation of own task	e completion: indent work with kits and in educational programming environments in solving and presentation of the solution with methodological recommendations.
Learning outcomes: 1. To acquire an over 2. To acquire skills environments.	view of robotic sets and robotic programming environments. in constructing and programming robots in selected robotic programming
<b>Brief outline of the c</b> 1. Robotic kit (Lego I mechanical parts of m 2. Programming of m Education Spike - br sensors, datalogging. Hacks, Rain or shine 3. Programming of ro of mini-projects 4. Robotic competition 5. Creation and present a maze, sports, rescue	ourse: Mindstorms EV3 and Spike Prime) - parts, motors, sensors, basics of building nodels robotic models in Lego Education Mindstorms EV3 and Classroom, Lego anching commands, cycles, blocks, events, parallel processes, working with Creating mini-projects (eg explorer, rescuer, parking, Super Cleanup, Life ?) botic models in the block programming environment EV3 and Spike - creation ons, ideas for more demanding projects. entation of the final project - a programmed robotic model (eg going through er) with documentation.
Recommended litera 1. BUMGARDNER, geekdad/2007/03/the 2. Carnegie Mellon. I 3. Pavel Petrovič, http 4. Get ready with Les 5. LEGO® Education development#about 6. SCRATCH Progra	ture: J. (2007) The Origins of Mindstorms. Wired, 2007. http://www.wired.com/ _origins_of_/ Robotics Academy. http://www.education.rec.ri.cmu.edu/ p://robotika.sk/events/18Skolenia/priruckaEV3.pdf ssons: https://education.lego.com/en-us/lesson n Professional Development, https://education.lego.com/en-us/professional- mming Lessons, https://primelessons.org/en/Lessons.html,

Course langua Slovak	ge:						
Notes:							
Course assess Total number of	nent of assessed studen	ts: 54					
А	В	С	D	Е	FX		
53.7	24.07	11.11	1.85	0.0	9.26		
Provides: Ing.	Angelika Hanesz						
Date of last me	odification: 23.11	.2021					
Approved: pro	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Pl	nD.		

	COURSE INFORMATION LETTER
University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	Science
<b>Course ID:</b> ÚINF/ PWS/25	Course name: Programming of web-pages
Course type, scope a Course type: Practi Recommended cou Per week: 2 Per stu Course method: pro	and the method: ce rse-load (hours): ady period: 28 esent
Number of ECTS cr	redits: 2
Recommended seme	ester/trimester of the course: 4.
Course level: I.	
Prerequisities: (ÚIN	F/DBS1a/15 or ÚINF/DBS/15) and (ÚINF/PAZ1a/15 or ÚINF/PRG1/15)
<b>Conditions for cours</b> 50% of the marks fro	se completion: om continuous assignments
Learning outcomes: An overview of mod basic principles of c (PHP) web program web pages. Know the	ern technologies for creating dynamic websites. Describing and appliyng the creating dynamic web pages. Utilize client-side (JavaScript) and server-side ming technologies. Using relational databases (MySQL) to create application e security risks of dynamic websites and be able to eliminate them.
<b>Brief outline of the o</b> 1. JavaScript - introd	course: luction to JavaScript programming.

- 2. JavaScript communication with the user, validation of data in forms using JavaScript.
- 3. JavaScript introduction to using the jQuery library.
- 4. PHP introduction to PHP programming.
- 5. PHP data and control structures of the PHP language.
- 6. PHP communication with the user, validation of data in forms using PHP.
- 7. PHP object oriented problem solving in PHP language. File manipulation.
- 8. PHP User authentication (cookies, session).
- 9. MySQL introduction to working with MySQL database system.
- 10. MySQL Simple applications using the database for data storage and access.

11. Web application security - an introduction to web application security.

12. Web application security - the most common web application security problems and how to eliminate them.

# **Recommended literature:**

BLUM, Richard. PHP, MySQL& JavaScript: All-in-One. Hoboken, New Jersey: John Wiley, 2018. ISBN 978-1-119-46838-7.

KROMANN, Frank M. Beginning PHP and MySQL: From Novice to Professional. 5. CA, USA: Apress, 2018. ISBN 978-1-4302-6043-1.

HUSEBY, Sverre H. Zranitelný kód. Brno: Computer Press, 2006, 207 s. ISBN 80-251-1180-6. SNYDER, Chris, Thomas MYER a Michael SOUTHWELL. Pro PHP Security: From Application Security Principles to the Implementation of XSS Defenses. 2. United States of America: Apress, 2010. ISBN 978-1-4302-3318-3.

## **Course language:**

Slovak language, knowledge of English language is only necessary for reading documentation.

#### Notes:

Content prerequisite: WBdi/15 Web and user interface design

### **Course assessment**

Total number of assessed students: 200

А	В	С	D	Е	FX
9.5	8.5	9.5	9.0	22.5	41.0

Provides: PaedDr. Ján Guniš, PhD., univerzitný docent

**Date of last modification:** 02.03.2025

University: P. J. Šafárik University in Košice						
Faculty: Faculty of Science						
<b>Course ID:</b> ÚINF/ PAZ1a/15	Course name: Programming, algorithms, and complexity					
Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 4 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 42 / 56 esent					
Number of ECTS cro	edits: 8					
Recommended seme	ster/trimester of the course: 1.					
Course level: I.						
Prerequisities:						
<b>Conditions for cours</b> Graded activities dur Final examination: pr Rules to pass the subj final project) and test defined limit of total	e completion: ing semester: assignments, small exams, midterm, final project. ractical finalterm focused on a complex task. ect: Pass the minimal limit of points for category of homeworks (assignments, ts (small exams, midterm). Get at least 42% from the finalterm and pass the points for all graded activities.					
Learning outcomes: Get an ability to imploriented programmin	ement basic Java programs and obtain essential knowledge related to object- g.					
<b>Brief outline of the c</b> 1. Introduction to Java objects using turtle gr 2. For-loops, local var conditions. 3. While-loop, return	<b>ourse:</b> a and JPAZ2 framework, first Eclipse project, interactive communication with raphics, repeating code in loops, notion of class, object, and method. riables, variable types, arithmetic expressions, random numbers, random walk, ing a value from a method, reference and reference variables, debugging					
4. Primitive and refer instance variables.	rence types, chars, String objects (including basic algorithms), mouse events,					
<ul><li>6. Advanced array alg</li><li>7. Exceptions and exc</li></ul>	sorithms, two-dimensional array. ception handling, files and directories, writing to text files.					
<ol> <li>8. Reading from text</li> <li>9. Creating classes, overloading</li> </ol>	files. encapsulation, getters and setters, constructors and their hierarchy, method					
10. Inheritance and p 11. Java Collections autoboxing, interface 12. Access modifiers static methods and va	olymorphism. s Framework, ArrayList class, wrapper classes for primitive types and s List, Set, Map and their implementations, methods equals and hashCode. , abstract classes and methods, creating and implementing interfaces, sorting, ariables.					
13. Creating and thro	wing exceptions, checked and runtime exceptions, JavaDoc, Maven.					
<b>Recommended litera</b>	iture:					

# **Recommended literature:**

1. ECKEL, Bruce. Thinking in Java. Fourth edition. Upper Saddle River, NJ: Prentice Hall, c[2006]. ISBN 978-01-318-7248-6.

2. PECINOVSKÝ, Rudolf. OOP: naučte se myslet a programovat objektově. Brno: Computer Press, 2010. ISBN 978-80-251-2126-9.

3. SIERRA, Kathy a Bert BATES. Head first Java. Vyd. 2. Sebastopol: O'Reilly, 2005. ISBN 978-05-960-0920-5.

## **Course language:**

Slovak language, english language is required only to read Java API documentation.

Notes:

## **Course assessment**

Total number of assessed students: 961

А	В	С	D	Е	FX
16.86	8.64	12.28	18.73	13.94	29.55

**Provides:** RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD., RNDr. Viktor Pristaš, RNDr. Richard Staňa, Mgr. Viktor Olejár, Mgr. Dominika Kotlárová, doc. RNDr. Ľubomír Šnajder, PhD.

Date of last modification: 04.01.2022

Faculty: Faculty of Science

Course ID: ÚINF/	Course name: Programming, algorithms, and complexity
PAZ1b/15	

# Course type, scope and the method:

**Course type:** Lecture / Practice

**Recommended course-load (hours): Per week:** 2 / 4 **Per study period:** 28 / 56

Course method: present

**Number of ECTS credits:** 7

### **Recommended semester/trimester of the course: 2**.

Course level: I.

**Prerequisities:** ÚINF/PAZ1a/15

## **Conditions for course completion:**

Graded activities during semester: assignments, small theoretical exams, practical and theoretical midterm.

Final examination: practical and theoretical finalterm.

Rules to pass the subject: Get at least 50% from theoretical activities (small exams, theoretical midterm and theoretical finalterm) and from practical activities (practical midterm and finalterm). Pass the defined limit of total points for all graded activities.

### Learning outcomes:

To know essential algorithms, data structures, and methods used for efficient algorithms design. To understand time complexity analysis. To practice efficient implementation of algorithms. To recognize combinatorial and graph algorithms.

### Brief outline of the course:

- 1. Recursion and fractals.
- 2. Binary search, basic sorting algorithms, time complexity analysis, O-notation.
- 3. Basic data structures and algorithms: linked list, stack, queue.
- 4. Trees and their applications.
- 5. Efficient sorting algorithms (QuickSort, MergeSort, HeapSort).
- 6. Backtracking.
- 7. Dynamic programming, divide and conquer strategy.
- 8. Unweighted graphs, graph traversal, graph topological sort.
- 9. Weighted graphs, the shortest path algorithms.
- 10. Minimum spanning tree, greedy algorithms.
- 11. Hashing, amortized time complexity, string-searching algorithms.

### **Recommended literature:**

1. WRÓBLEWSKI, Piotr. Algoritmy: datové struktury a programovací techniky. Brno: Computer Press, 2004. ISBN 80-251-0343-9.

2. CORMEN, Thomas H. Introduction to algorithms. 3rd ed. Cambridge: MIT Press, c2009. ISBN 978-0-262-03384-8.

3. KLEINBERG, Jon a Éva TARDOS. Algorithm design. Thirteenth impression. Noida, India: Pearson, c2014. ISBN 9789332518643.

4. MAREŠ, Martin a Tomáš VALLA. Průvodce labyrintem algoritmů. Praha: CZ.NIC, z.s.p.o., 2017. CZ.NIC. ISBN 978-80-88168-19-5.

## **Course language:**

Slovak language, literature is available in english and czech language.

## Notes:

### **Course assessment**

Total number of assessed students: 1356

А	В	С	D	Е	FX
14.97	7.82	10.62	18.88	20.65	27.06

**Provides:** RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD., RNDr. Viktor Pristaš, Mgr. Dominika Kotlárová, doc. RNDr. Ľubomír Šnajder, PhD.

Date of last modification: 04.01.2022

University: P. J. Šafárik	University in Košice
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Faculty: Faculty of Science

Course ID: ÚINF/	Course name: Programming, algorithms, and complexity
PAZ1c/17	

# Course type, scope and the method:

Course type: Lecture / Practice

**Recommended course-load (hours): Per week:** 2 / 3 **Per study period:** 28 / 42

**Course method:** present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: I.

**Prerequisities:** ÚINF/PAZ1a/15

### **Conditions for course completion:**

Conditions for continuous evallation: Active participation in exercises.

Conditions for the final evaluation: Implementation and presentation of one or two team projects with sufficient score. Criteria for obtaining points are listed on the course page https:// paz1c.ics.upjs.sk/

### Learning outcomes:

Ability to design and implement more complex applications with a three-tier architecture, relational database and standard design patterns. The ability to create a REST server in the Spring boot framework and a simple Angular application that can communicate with this server.

### Brief outline of the course:

1. Identification of Classes, Methods and Instance Variables, Entities, Unit Tests and JUnit.

2. Introduction to JavaFX, FXML, Scene Builder, Controller.

3. Model-View-Controller design pattern, Observable and Property classes, model of JavaFx models, persistent layer, entities and identifiers, CRUD in-memory storage, GUI and persistent layer interconnection.

4. Design of interfaces for DAO objects. Advantages and disadvantages of associations between classes against manually wired associations. Implementation of the Factory design pattern as an abstraction of wired classes. Enum. Database persistent layer. JDBCTemplate configuration, RowMapper.

5. Data input via JDBCTemplate. Associations between classes. Relationships with cardinalities: 1:1, 1:M, M:N. RDB design and implementation in code. Design of a more complex data model, ResultSetExtractor.

6. Business layer, three-tier application, modal windows, entity modification in JavaFX and MySQL.

7. Logging - System.out.println as the easiest way to log. Logging with Slf4j. Secure password storage.

8. Annotations, work with lambda expressions, generic classes.

9. Spring Boot and REST services. Json format.

10. Angular - installation, TypeScript, DOM model, components and their properties, event capture in components.

11. Angular - communication between components, forms, input validation.

12. Angular - services, Observable, injection, communication with REST server via HTTP.

## **Recommended literature:**

1. WALLS Craig. Spring in Action. Manning Publications; 5th edition, 2018. ISBN 978-1-617-29494-5.

2. ECKEL, B. Thinking in Java. Pearson; 4th edition,2006. ISBN 0131872486.

3. Website of framework Angular. Available online: <a href="https://angular.io/">https://angular.io/</a>

## **Course language:**

Slovak

Notes:

Content prerequisites: basic programming in Java

## **Course assessment**

Total number of assessed students: 186

А	В	С	D	Е	FX
22.58	10.22	13.98	26.34	23.12	3.76

**Provides:** RNDr. Viliam Kačala, PhD.

**Date of last modification:** 04.01.2022

University: P. J	University: P. J. Šafárik University in Košice					
Faculty: Facult	Faculty: Faculty of Science					
Course ID: KPPaPZ/Ps/15	Course ID: Course name: Psychology XPPaPZ/Ps/15					
Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present						
Number of EC	I'S credits: 2					
Recommended	semester/trimes	ster of the cours	<b>e:</b> 3.			
<b>Course level:</b> I.						
Prerequisities:						
<b>Conditions for</b>	course completi	on:				
Learning outco	omes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
Course assessment Total number of assessed students: 978						
А	В	С	D	Е	FX	
40.49	40.49 22.39 14.52 11.04 10.02 1.53					
Provides: doc. Mgr. Mária Bačíková, PhD., Mgr. Ondrej Kalina, PhD.						
Date of last modification: 04.02.2025						
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J. Šafárik University in Košice			
Faculty: Faculty of Science			
<b>Course ID:</b> KPPaPZ/PKŽ/15	Course name: Psychology of Everyday Life		
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present Number of ECTS credits: 2			
Recommended semester/trimester of the course: 3., 5.			
Course level: I.			
Prerequisities:			
Conditions for cours The evaluation of the set requirements, whi ensure an objective a moral standards. The process or in the asse 1. Active participatio 2. Elaboration and pr points 20; minimum 1 3. Elaboration of an e minimum number of The final evaluation ( A 40b - 37b B 36b - 33b C 32b - 29b D 28b - 25b E 24b - 21b FX 20b - 0b Learning outcomes:	e completion: course and its subsequent completion will be based on clearly and objectively ch will be set in advance and will not change. The aim of the assessment is to nd fair mapping of the student's knowledge while adhering to all ethical and re is no tolerance for students' fraudulent behavior, whether in the teaching ssment process. n in seminars resentation of PPT presentation on the assigned topic. Maximum number of number of points 11. essay in the range of 4xA4 (standard pages). Maximum number of points 20; points 11. (grade) is the sum of points for the presentation and the essay.		
The student is able everyday situations st	to demonstrate an understanding of the individual's behavior in selected uch as conflict, group influence, empathy, helping, aggression, etc.		

The student is able to describe, explain and evaluate the psychological mechanisms that occur in everyday situations.

The student is able to apply basic psychological knowledge to himself (self-regulation) but also in interaction with others (cooperation).

The method of teaching the subject will be oriented to the student. Speakers will be interested in the needs, expectations and opinions of students so as to encourage them to think critically by expressing respect and feedback on their opinions and needs.

The content of the curriculum will be based on primary and high-quality sources that will reflect the topicality of the topics so as to ensure the connection of the curriculum with other subjects and also

the connection of the curriculum with practice. Students will be expected to take an active approach in lectures and seminars with an emphasis on their independence and responsibility.

## Brief outline of the course:

How to understand human behavior (overview of basic approaches in psychology); Basic overview of cognitive processes; Learning processes and their use in practice; Social influences, prosocial and antisocial behavior; How human emotions and motivations work; Deciding - why and when we take risks; Childhood experiences and their relationship to adulthood; Abnormal behavior, mental disorders and therapeutic approaches

### **Recommended literature:**

## **Course language:**

Notes:

### **Course assessment**

Total number of assessed students: 253

А	В	С	D	Е	FX
46.25	23.32	24.51	4.35	1.19	0.4

Provides: Mgr. Ondrej Kalina, PhD.

Date of last modification: 10.02.2025

University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of Science				
<b>Course ID:</b> ÚINF/ RPBI/20	Course name: Resolving computer security incidents			
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present				

Number of ECTS credits: 3

Recommended semester/trimester of the course: 6.

Course level: I., II.

Prerequisities:

#### **Conditions for course completion:**

The condition for passing the course are homeworks (50% of the total number of points) and the final practical task (50% of the total number of points).

### Learning outcomes:

The result of the education is an understanding of the basic approaches to solving computer security incidents from procedural and legal requirements to ways of identifying the security incident and the method of its technical solution.

## **Brief outline of the course:**

1. Introduction to computer security incident hadling and response, 2. The process of handling and response to computer security incidents and computer security incident response teams, 3. Legal aspects of the computer security incidents handling, 4. Preparing for the security incidents handling and the first response, 5. Introduction to digital forensic analysis, 6. Incident handling and response to computer security incidents in the field of malware, 7. Incident handling and response to network security incidents I., 9. Incident handling and response to network security incidents I., 10. Incident handling and response to computer security incident security incidents in the field of web applications I., 11. Incident handling and response to cloud security incidents, 13. Incident handling and response to cloud security incidents, 14. Final assignment.

#### **Recommended literature:**

1. MURDOCH, Don. Blue Team Handbook: Incident Response Edition: A condensed field guide for the Cyber Security Incident Responder. South Carolina, United States: CreateSpace Independent Publishing Platform, 2014. ISBN 978-1500734756, 2. ANSON, Steve. Applied Incident Response. New York, United States: Wiley, 2020. ISBN 978-1119560265, 3. ROBERTS, Scott. Intelligence-Driven Incident Response: Outwitting the Adversary. Sebastopol, California, United States: O'Reilly Media, 2017. ISBN 978-1491934944.

### Course language:

Slovak or English

Notes:
Content prerequisites: basic knowledge in the field of information security, basics of working with the Linux operating system, basic knowledge of computer networks.

			-				
Course assessment Total number of assessed students: 24							
A B C D E FX							
54.17	25.0	16.67	4.17	0.0	0.0		
Provides: doc. RNDr. JUDr. Pavol Sokol, PhD. et PhD., RNDr. Eva Marková							
Date of last modification: 26.09.2021							
Approved: pro:	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Ph	ıD.		

University: P. J.	. Šafárik Univers	ity in Košice					
Faculty: Faculty	y of Science						
Course ID: KPI OLŠ/15	Course ID: KPE/ Course name: School Administration and Legislation						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of EC	TS credits: 2						
Recommended	semester/trimes	ster of the cours	<b>e:</b> 3., 5.				
<b>Course level:</b> I.							
Prerequisities:							
Conditions for	course completi	on:					
Learning outco	mes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessm Total number of	Course assessment Total number of assessed students: 355						
Α	В	С	D	Е	FX		
45.92	45.92 31.27 13.24 5.92 3.1 0.56						
Provides: PaedDr. Michal Novocký, PhD., Mgr. Beáta Sakalová, PhD.							
Date of last mo	Date of last modification: 14.09.2024						
Approved: prof	. RNDr. Vladimí	ír Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

University: P. J	University: P. J. Šafárik University in Košice						
Faculty: Facult	y of Science						
Course ID: KF/ VKFV/07	Course ID: KF/ VKFV/07Course name: Selected Topics in Philosophy of Education (General Introduction)						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of EC	TS credits: 2						
Recommended	semester/trimes	ster of the cours	<b>e:</b> 3., 5.				
Course level: I.							
Prerequisities:							
Conditions for	course completi	ion:					
Learning outco	omes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 52							
А	В	С	D	Е	FX		
63.46	63.46 17.31 17.31 1.92 0.0 0.0						
Provides: PhDr. Dušan Hruška, PhD.							
Date of last mo	dification: 13.04	1.2022					
Approved: prof	f. RNDr. Vladimí	ír Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

University: P. J. Šafárik University in Košice					
Faculty: Faculty of Science					
Course ID: KPPaPZ/SELFM/25Course name: Self-Marketing					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of ECTS credits: 4					
<b>Recommended semester/trimester of the course:</b> 4., 6.					
Course level: I., P					
Prerequisities:					
Conditions for course completion: The conditions for passing the subject are as follows: 1. Active participation in exercises. Max. the missed range is 90 min. 2. Submission of the reflection on the selected topic within the specified time. Reflection topic: will be given in the exercise. The evaluation of the subject and its subsequent completion will be based on clearly and objectively determined requirements, which will be determined in advance and will not change. The aim of the evaluation is to ensure an objective and fair mapping of the student's knowledge while observing all ethical and moral standards. There is no tolerance for fraudulent student behavior in either the teaching or assessment process.					
Learning outcomes: The student is able to understand and explain the basic assumptions of good self-marketing, knows the possibilities for the correct presentation of his own person and understands the related knowledge and principles of personal and communication area. He / she can understand his / her competencies, his / her goals, how to make his / her strengths visible and he / she can apply this knowledge and social and professional skills in the personal and professional sphere of his / her life, which will also improve his / her employment opportunities.					
Brief outline of the course: What is marketing? (Marketing - Mix) Basics of self-marketing (Personal opinion is crucial, Goal setting, Proper use of opportunity) Me and my influence (What can I offer? What does he / she have unlike me? How do others see me? Ability to defend one's own opinion, Think positively!, I know how to explore myself - what options do I have?), Competence (Have your own opinion, How to withstand criticism, Be a team player, Competence at work), Draw attention to yourself (Voice and word selection, Active in meetings, Present yourself successfully).					
Recommended literature: VÝROST, Jozef - SLAMĚNÍK, Ivan. Sociální psychologie. 2., přepr. a rozš. vyd. Praha : GRADA, 2008. 408 s.					

VÝROST, Jozef - SLAMĚNÍK, Ivan. Aplikovaná sociální psychologie I : Člověk a sociální instituce. 1. vyd. Praha : Portál, 1998. 384 s. ISBN 80-7178-269-6.

KOMÁRKOVÁ, Růžena - SLAMĚNÍK, Ivan - VÝROST, Jozef. Aplikovaná sociální psychologie III : Sociálněpsychologický výcvik. 1. vyd. Praha : Grada Publishing, 2001. 224 s. VÝROST, Jozef - SLAMĚNÍK, Ivan. Aplikovaná sociální psychologie II. 1. vyd. Praha : Grada Publishing, 2001. 260 s.

## **Course language:**

slovak

## Notes:

After passing the certification exams from all 4 modules (Teamwork, Selfmarketing, Conflict Management, Communication) the student will receive an ECo-C card and an ECo-C certificate.

## **Course assessment**

Total number of assessed students: 0

A	В	С	D	Е	FX	
0.0	0.0	0.0	0.0	0.0	0.0	
Provides: Mgr. Ondrei Kalina, PhD., Mgr. Lenka Hudáková, PhD.						

**Date of last modification:** 04.02.2025

University: P. J. Šafá	University: P. J. Šafárik University in Košice					
Faculty: Faculty of S	cience					
Course ID: ÚINF/ Course name: Seminar for bachelor thesis for XIb SZPX/22						
Course type, scope a Course type: Practic Recommended cour Per week: 1 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 14 esent					
Number of ECTS cro	Number of ECTS credits: 1					
Recommended semester/trimester of the course: 5.						
Course level: I.						
Prerequisities:						
Conditions for cours Conditions for ongoin 1. Analysis of selecte 2. Analysis of selecte 3. Analysis of select science festivals, exp Conditions for the fin	<b>be completion:</b> Ing evaluation: and types of educational/assistance software. and types of teaching aids (2D/3D/digital, educational kits). The types of non-formal computer education (competitions, circles, camps, erience centres). and evaluation:					

1. Creation of the bachelor thesis assignment (title, objectives, literature, supervisor).

2. Creation of an overview of the current state of the studied issue.

Conditions for successful completion of the course:

Fulfillment of all ongoing and final assignments.

### Learning outcomes:

The student will get an idea of the bachelor thesis focused on the creation of educational and assistive software, teaching aids for formal and informal informatics education (its types, structure and life cycle).

The student actively uses educational information resources (publication databases, journals and conference proceedings, educational projects).

The student will create an overview of the current state of teaching of issues related to the selected topic of the bachelor thesis.

### Brief outline of the course:

1. Bachelor theses focused on the creation of educational and assistive software, teaching aids for formal and informal informatics education (types of work, structure of work, life cycle of work)

2. Analysis of selected bachelor theses from CRZP.

3. Overview of information resources (available publication databases, journals and conference proceedings, educational projects).

4. Educational and assistive software development (life cycle, development environments, examples of educational and assistive software).

5. Types of teaching aids (2D/3D/digital, educational kits).

6. Specifics of formal and informal informatics education (competitions, clubs, camps, science festivals, experience centres).

## **Recommended literature:**

CENTRUM VEDECKO-TECHNICKÝCH INFORMÁCIÍ SR. Centrálny register záverečných a kvalifikačných prác [online]. [cited 2022-1-31]. Available from: https://cms.crzp.sk/

Informatics in Education. Vilnius University Institute of Data Science and Digital Technologies. ISSN 2335-8971 (online). Also available from: https://infedu.vu.lt/journal/INFEDU

COMPUTER SCIENCE TEACHERS ASSOCIATION. Home Page Computer Science Teachers Association [online]. [cited 2022-1-31]. Available from: https://www.csteachers.org/

ASSOCIATION FOR COMPUTING MACHINERY. The ACM Digital Library [online]. [cited 2022-1-31]. Available from: https://dl.acm.org/

SPRINGER NATURE SWITZERLAND AG. Home - Springer [online]. [cited 2022-1-31]. Available from: https://link.springer.com/

UNIVERZITA MATEJA BELA V BANSKEJ BYSTRICI, TECHNICKÁ UNIVERZITA V LIBERCI, 2021. Zborníky medzinárodnej konferencie DidInfo (od roku 2011) [online]. [cited 2022-1-31]. Available from: http://www.didinfo.net/predchozi-rocniky (or http:// www.didinfo.net/minule-rocniky)

### **Course language:**

Slovak and partly English due to selected information sources

## Notes:

By default, teaching is carried out face to face. If this is not possible (eg due to a pandemic), teaching is provided at a distance through video conferencing programs and LMS.

### **Course assessment**

Total number of assessed students: 0

abs	n
0.0	0.0

Provides: doc. RNDr. Ľubomír Šnajder, PhD.

Date of last modification: 10.02.2022

University: P. J. Ša	ărik Universit	y in Košice
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Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Separation Methods
ASM/03	

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 2 / 1 Per study period: 28 / 14

**Course method:** present

**Number of ECTS credits:** 5

Recommended semester/trimester of the course: 6.

Course level: I.

**Prerequisities:** (ÚCHV/ANCHU/03 or ÚCHV/ANCHU/21 or ÚCHV/ANCHE/09 or ÚCHV/ ANCH1b/03 or ÚCHV/ANCH1b/21) and (ÚCHV/PAEC/03 or ÚCHV/PANCH/06 or ÚCHV/ PANCHE/09 or ÚCHV/PACU/03)

#### **Conditions for course completion:**

1. Preparation and presentation of a project focused on the application of separation methods.

2. Examination. The exam consists of 3 questions (each of 33%), 50% must be obtained for the pass exam.

#### Learning outcomes:

Survey of basic principles, theoretical background and applications of separation methods in research and analytical practice.

### Brief outline of the course:

Basic principles, classification, theory and applications of separation methods. Extraction - LLE, SPE, SPME. Chromatographic methods - theory, classification. Gas chromatography, stationary phases. Instrumentation, detectors in GC. Data evaluation - qualitative and quantitative analysis. High-performance liquid chromatography, principles, classification. Stationary and mobile phases in LC, instrumentation. Applications.

Planar chromatographic methods - TLC, HPTLC, PC.

Electrophoretic techniques and their applications.

### **Recommended literature:**

Skoog D. A., Leary J. J.: Principles of instrumental analysis. Saunders College Publishing, New York 1997.

Pawliszyn J., Lord H. L.: Handbook of sample preparation, Wiley 2010.

Current scientific literature

### Course language:

Slovak, english language

Notes:

Course assessn Total number o	nent f assessed studen	ts: 506				
A B C D E FX						
28.66	26.09	25.1	12.65	5.34	2.17	
Provides: doc. RNDr. Taťána Gondová, CSc.						
Date of last modification: 01.08.2022						
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	anislav Krajči, Ph	ıD.	

University: P. J. Šafa	árik University in Košice
Faculty: Faculty of S	Science
Course ID: KPO/ SPKVV/15	Course name: Social and Political Context of Education
Course type, scope a Course type: Lectu Recommended cou Per week: 2 Per stu Course method: pr	and the method: re irse-load (hours): ady period: 28 esent
Number of ECTS cr	redits: 2
Recommended sem	ester/trimester of the course: 4., 6.
Course level: I.	
Prerequisities:	
Conditions for cour Evaluation of the de A 100,00% - 91,0 B 90,99% - 81,00 C 80,99% - 71,00 D 70,99% - 61,00 E 60,99% - 51,00 FX 50,99% and le	se completion: veloped assignment. 0% % % % %
Learning outcomes:	
The aim and purpose	e of teaching the subject is to impart knowledge and promote reflection on the

The aim and purpose of teaching the subject is to impart knowledge and promote reflection on the issues of education and training in the context of social and political change.

Development of knowledge: the student will be able to know the current theoretical background related to the process of education and training in a modern democratic society.

The student will be able to navigate the social and political space - politically, legally, socially and culturally. He/she will be able to look for alternatives and solutions to dysfunctions, while at the same time exploiting opportunities and ways to implement them.

### Brief outline of the course:

The status, role and functions of education in human life and society. The political, social and economic objectives of education. Education, learning and social change in the context of globalisation. Macrosocial determinants of education. Current roles of education and training in modern performance and democratic society.

### **Recommended literature:**

Domestic and foreign journal literature

Kudláčová, B.(2007) Človek a výchova v dejinách európskeho myslenia. Trnava: PdF TU Zeus Leonardo (2010) Handbook of Cultural Politics and Education. Rotterdam, The Netherlands.

#### Course language:

Slovak

Notes:

Course assessment						
Total number o	f assessed studen	ts: 201				
A B C D E FX						
60.7	20.9	10.95	4.48	1.49	1.49	
Provides: Mgr. Ján Ruman, PhD.						
Date of last modification: 13.04.2022						
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Pl	ıD.	

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
<b>Course ID:</b> ÚINF/ SWI1a/15	Course name: Software engineering
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 28 esent
Number of ECTS cr	edits: 2
Recommended seme	ster/trimester of the course: 4.
Course level: I.	
Prerequisities: ÚINF	/DBS1a/15
<b>Conditions for cours</b> The evaluation will be the (group) project of obtaining 50% of the are published in the A	e completion: be given on the basis of the proper fulfilment of the partial tasks of solving during the semester. The minimum prerequisite for passing the subject is total possible number of points. The sub-probation conditions for evaluation AIS.
By completing the su - acquires basic know - get familiar with the - familiarizes himself the use of relevant SV - will gain basic expe	bject, the student: vledge of the principles and methods of software engineering, e individual stages of the software development life cycle, f with the modeling of software systems and acquires basic knowledge from W tools, prience in working in a team and with project management and presentation.
<ul> <li>Brief outline of the c</li> <li>1. Introduction to sof</li> <li>2. Software processes</li> <li>3. Selected support to</li> <li>4. Requirements engi</li> <li>5. Agile methods.</li> <li>6. Modeling of system</li> <li>7. Implementation of</li> <li>8. Architectures of soc</li> <li>9. Testing.</li> <li>10. Evolution of system</li> <li>11. Case studies of soc</li> <li>Recommended literat</li> <li>1. BERKUN, S. The</li> </ul>	ourse: tware engineering. s bols for managing software processes. neering. ns. software systems. oftware systems. ems. oftware systems. ture: Art Of Project Management. O Reilly, 2005.
2. BJORNER, D. Sof 3. SOMMERVILLE, Course language:	tware engineering 1,2,3. Springer-Verlag Berlin, 2006.I. Software Engineering. Addison-Wesley, 2015.

Slovak or Engl	ish						
Notes: Content prerequisities: Database systems, OOP							
Course assessment Total number of assessed students: 372							
А	В	С	D	Е	FX		
19.09	24.46 19.62 16.94 18.55 1.34						
Provides: prof.	Provides: prof. RNDr. Gabriel Semanišin, PhD., RNDr. Dávid Varga						
Date of last modification: 25.07.2022							
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.		

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
<b>Course ID:</b> ÚINF/ SZPa/22	Course name: Special seminar to bachelor thesis
Course type, scope a Course type: Practic Recommended cou Per week: 1 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 14 esent
Number of ECTS cr	edits: 1
Recommended seme	ster/trimester of the course: 5.
Course level: I.	
Prerequisities:	
<b>Conditions for cours</b> Update of the bachel selected in the bache scientific article of 5 supervisor.	<b>te completion:</b> or thesis website. Presentation of the current state of knowledge for the topic elor's thesis. Presentation of the first results of bachelor thesis. Preparing of pages length in the required structure. Approval of the article by the thesis
Learning outcomes: Basic knowledge abo aspects of the bachelo creating the database of the current state of preparation of a scien	but the procedure and writing of the bachelor's thesis, standards and formal or's thesis, the creation of bibliographic references and their citations, tools for of used literature. Basic knowledge of the content and form of presentation of knowledge for the topic of the bachelor's thesis. Basic knowledge about the nutific article.
<b>Brief outline of the c</b> 1. Procedure for writ 2. Standards and form 3. Rules of writing an 4. Documentation, N 5. Information and do 6. Instructions for cree 7. Selected typograph 8. Professional resou 9. Principles of corre 10. Tools for creating 11. Annotation of rea 12. Presentation of se 13. Presentation of se	ourse: ing the bachelor thesis. nal aspects of the bachelor thesis. nd editing documents STN 01 6910. umbering of sections and subsections of written documents STN ISO 2145. ocumentation STN ISO 690. eating bibliographic references to information sources and their citation. nic principles. rces on the Internet. ct citation. g your own database of used literature. d literature, creation of searches. elected topics of bachelor theses.
<b>Recommended litera</b> 1. STN 01 6910. Rul 2. STN ISO 2145. Do 1997.	<b>ture:</b> es of writing and editing documents. 2011. ocumentation. Numbering of sections and subsections of written documents.

3. STN ISO 690. Information and documentation. Instructions for creating bibliographic references to information sources and their citation. 2012

4. KATUŠČÁK, Dušan. How to write final and qualification theses. Enigma, 2013

5. Scientific literature related to the topic of the final thesis according to the recommendation of the thesis supervisor.

<b>Course language:</b> Slovak or English					
Notes:	Notes:				
Course assessment Total number of assessed students: 195					
abs	n	neabs			
98.97	1.03	0.0			
Provides: RNDr. Miroslav Opiela, PhD., RNDr. Dávid Varga					
Date of last modification: 08.01.2022					
Approved: prof. RNDr. Vladimí	r Zeleňák, DrSc., prof. RNDr. Sta	nislav Krajči, PhD.			

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ SZPb/22	Course name: Special seminar to bachelor thesis
Course type, scope a Course type: Practic Recommended cou Per week: 1 Per stu Course method: pre	and the method: ce rse-load (hours): ady period: 14 esent
Number of ECTS cr	edits: 1
Recommended seme	ster/trimester of the course: 6.
Course level: I.	
Prerequisities:	
<b>Conditions for cours</b> Update of the bachel Preparation of at leas required structure and about the results of the	<b>Se completion:</b> or thesis website. Presentation of the obtained results of the bachelor's thesis. t a 10-page scientific article for the topic chosen in the bachelor's thesis in the d its approval by the thesis supervisor. Creating a promotional image (poster) he bachelor's thesis.
Learning outcomes: Basic knowledge of of presentation of the the preparation of a purposes.	the central register of final theses, licenses and copyrights, content and form he overall results achieved in the bachelor's thesis. Basic knowledge about scientific article and presentation of the achieved results for popularization
<b>Brief outline of the c</b> 1. Central register of 2. Licenses and Copy 3. Directive on basic 4. The most common 5. Evaluation criteria 6. Preparation of a pr 7. Preparation of a sc 8. Preparation of a sc 10. Procedure for sub 11. Popularization of 12. Presentations of t 13. Presentations of t	final theses. /rights. requirements for final theses at UPJŠ in Košice. mistakes in writing a final thesis. and examples of assessments. resentation for the defense of the final thesis. eientific article. resentation for the defense of the final thesis. eientific article. bientific article. bien
<b>Recommended litera</b> 1. STN 01 6910. Rul 2. STN ISO 2145. Do 1997	<b>iture:</b> es of writing and editing documents. 2011. ocumentation. Numbering of sections and subsections of written documents.

3. STN ISO 690. Information and documentation. Instructions for creating bibliographic references to information sources and their citation. 2012

4. KATUŠČÁK, Dušan. How to write final and qualification theses. Enigma, 2013

5. Scientific literature related to the topic of the final thesis according to the recommendation of the thesis supervisor.

## **Course language:**

Slovak or English

## Notes:

## Course assessment

Total number of assessed students: 171

abs	n	neabs			
98.83	1.17	0.0			
Provides: RNDr. Miroslav Opiela, PhD., RNDr. Dávid Varga					
Date of last modification: 08.01.2022					

University: P. J. Šafár	ik University in Košice
Faculty: Faculty of So	cience
<b>Course ID:</b> ÚTVŠ/ TVa/11	Course name: Sports Activities I.
Course type, scope an Course type: Practic Recommended cour Per week: 2 Per stue Course method: pre	nd the method: e rse-load (hours): dy period: 28 sent
Number of ECTS cre	edits: 2
Recommended semes	ster/trimester of the course: 1.
Course level: I., II., P	
Prerequisities:	
<b>Conditions for cours</b> Min. 80% of active pa	e <b>completion:</b> articipation in classes.
Learning outcomes: Sports activities in all They have a great im enables students to s improve.	their forms prepare university students for their professional and personal life. pact on physical fitness and performance. Specialization in sports activities trengthen their relationship towards the selected sport in which they also
Brief outline of the co Brief outline of the co The Institute of physic activities aerobics; ail yoga, power yoga, pi tennis, chess, volleyba Additionally, the Inst offers winter courses the Tisza River) with participation.	Durse: Durse: cal education and sport at the Pavol Jozef Šafárik University offers 20 sports cido, basketball, badminton, body-balance, body form, bouldering, floorball, ilates, swimming, fitness, indoor football, SM system, step aerobics, table all, tabata, cycling. itute of physical education and sport at the Pavol Jozef Šafárik University (ski course, survival) and summer courses (aerobics by the sea, rafting on an attractive programme, sports competitions with national and international
Recommended litera BENCE, M. et al. 200 [online] Dostupné na: BUZKOVÁ, K. 2006 8024715252. JARKOVSKÁ, H, JA Grada. ISBN 9788024 KAČÁNI, L. 2002. Ft 8089197027. KRESTA, J. 2009. Fu LAWRENCE, G. 201 SNER, Wolfgang. 200	<ul> <li>ture:</li> <li>b5. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</li> <li>. Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN</li> <li>. RKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: 4757308.</li> <li>utbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN</li> <li>. Htsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.</li> <li>9. Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.</li> <li>. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.</li> </ul>

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.

VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

## **Course language:**

Slovak language

## Notes:

## **Course assessment**

Total number of assessed students: 15781

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

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

## **Date of last modification:** 07.02.2024

University: P. J. Šafán	rik University in Košice
Faculty: Faculty of So	cience
Course ID: ÚTVŠ/ TVb/11	Course name: Sports Activities II.
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stue Course method: pre	nd the method: ce cse-load (hours): dy period: 28 csent
Number of ECTS cro	edits: 2
Recommended seme	ster/trimester of the course: 2.
Course level: I., II., P	
Prerequisities:	
<b>Conditions for cours</b> active participation in	e completion: a classes - min. 80%.
Learning outcomes: Sports activities in all They have a great im enables students to s improve.	their forms prepare university students for their professional and personal life. pact on physical fitness and performance. Specialization in sports activities trengthen their relationship towards the selected sport in which they also
<b>Brief outline of the co</b> Brief outline of the co The Institute of physi activities aerobics; ail yoga, power yoga, p tennis, chess, volleyb Additionally, the Inst offers winter courses the Tisza River) with participation.	<b>Durse:</b> Durse: cal education and sport at the Pavol Jozef Šafárik University offers 20 sports kido, basketball, badminton, body-balance, body form, bouldering, floorball, ilates, swimming, fitness, indoor football, SM system, step aerobics, table all, tabata, cycling. itute of physical education and sport at the Pavol Jozef Šafárik University (ski course, survival) and summer courses (aerobics by the sea, rafting on an attractive programme, sports competitions with national and international
Recommended litera BENCE, M. et al. 200 [online] Dostupné na: BUZKOVÁ, K. 2006	ture: )5. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8. : https://www.ff.umb.sk/app/cmsFile.php?disposition=a&ID=571 . Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN

8024715252.

JARKOVSKÁ, H, JARKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: Grada. ISBN 9788024757308.

KAČÁNI, L. 2002. Futbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN 8089197027.

KRESTA, J. 2009. Futsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345. LAWRENCE, G. 2019. Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902. SNER, Wolfgang. 2004. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141. STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.

VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

## **Course language:**

Slovak language

## Notes:

## **Course assessment**

Total number of assessed students: 13802

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

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

**Date of last modification:** 07.02.2024

University: P. J. Šafán	ik University in Košice
Faculty: Faculty of So	cience
Course ID: ÚTVŠ/ TVc/11	Course name: Sports Activities III.
Course type, scope an Course type: Practic Recommended cour Per week: 2 Per stue Course method: pre	nd the method: se se-load (hours): dy period: 28 sent
Number of ECTS cro	edits: 2
Recommended seme	ster/trimester of the course: 3.
Course level: I., II.	
Prerequisities:	
<b>Conditions for cours</b> min. 80% of active pa	e completion: articipation in classes
Learning outcomes: Sports activities in all They have a great im enables students to s improve.	their forms prepare university students for their professional and personal life. pact on physical fitness and performance. Specialization in sports activities trengthen their relationship towards the selected sport in which they also
<b>Brief outline of the co</b> Brief outline of the co The Institute of physi activities aerobics; ail yoga, power yoga, p tennis, chess, volleyb Additionally, the Inst offers winter courses the Tisza River) with participation.	Durse: Durse: cal education and sport at the Pavol Jozef Šafárik University offers 20 sports kido, basketball, badminton, body-balance, body form, bouldering, floorball, ilates, swimming, fitness, indoor football, SM system, step aerobics, table all, tabata, cycling. itute of physical education and sport at the Pavol Jozef Šafárik University (ski course, survival) and summer courses (aerobics by the sea, rafting on an attractive programme, sports competitions with national and international
Recommended litera BENCE, M. et al. 200 [online] Dostupné na: BUZKOVÁ, K. 2006 8024715252. JARKOVSKÁ, H, JA Grada. ISBN 9788024 KAČÁNI, L. 2002. F 8089197027. KRESTA, J. 2009. Fu LAWRENCE, G. 201 SNER, Wolfgang. 200	<ul> <li>ture:</li> <li>b) 1985. ISBN 80-8083-140-8.</li> <li>https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</li> <li>Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN</li> <li>RKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha:</li> <li>4757308.</li> <li>utbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN</li> <li>utsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.</li> <li>Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.</li> <li>Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.</li> </ul>

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.

VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

## **Course language:**

Slovak language

## Notes:

## **Course assessment**

Total number of assessed students: 9334

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

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

**Date of last modification:** 07.02.2024

University: P. J. Šafá	rik University in Košice						
Faculty: Faculty of S	Faculty: Faculty of Science						
<b>Course ID:</b> ÚTVŠ/ TVd/11	Course name: Sports Activities IV.						
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 28 esent						
Number of ECTS cro	edits: 2						
Recommended seme	ster/trimester of the course: 4.						
Course level: I., II.							
Prerequisities:							
<b>Conditions for cours</b> min. 80% of active pa	e completion: articipation in classes						
Learning outcomes: Sports activities in all They have a great im enables students to s improve.	their forms prepare university students for their professional and personal life. apact on physical fitness and performance. Specialization in sports activities strengthen their relationship towards the selected sport in which they also						
Brief outline of the c Brief outline of the co The Institute of physic activities aerobics; ai yoga, power yoga, p tennis, chess, volleyb Additionally, the Inst offers winter courses the Tisza River) with participation.	ourse: burse: ccal education and sport at the Pavol Jozef Šafárik University offers 20 sports kido, basketball, badminton, body-balance, body form, bouldering, floorball, ilates, swimming, fitness, indoor football, SM system, step aerobics, table all, tabata, cycling. titute of physical education and sport at the Pavol Jozef Šafárik University (ski course, survival) and summer courses (aerobics by the sea, rafting on an attractive programme, sports competitions with national and international						
Recommended litera BENCE, M. et al. 200 [online] Dostupné na BUZKOVÁ, K. 2006 8024715252. JARKOVSKÁ, H, JA Grada. ISBN 978802 KAČÁNI, L. 2002. F 8089197027. KRESTA, J. 2009. Fu LAWRENCE, G. 201 SNER, Wolfgang. 20	<ul> <li>Ature:</li> <li>O5. Plávanie. Banská Bystrica: FHV UMB. 198s. ISBN 80-8083-140-8.</li> <li>https://www.ff.umb.sk/app/cmsFile.php?disposition=a&amp;ID=571</li> <li>Fitness jóga, harmonické cvičení těla I duše. Praha: Grada. ISBN</li> <li>ARKOVSKÁ, M. 2005. Posilování s vlastním tělem 417 krát jinak. Praha: 4757308.</li> <li>'utbal:Tréning hrou. Bratislava: Peter Mačura – PEEM. 278s. ISBN</li> <li>utsal.Praha: Grada Publishing, a.s. 112s. ISBN 9788024725345.</li> <li>Power jóga nejen pro sportovce. Brno: CPress. ISBN 9788026427902.</li> <li>O4. Posilování ve fitness. České Budějovice: Kopp. ISBN 8072322141.</li> </ul>						

STACKEOVÁ, D. 2014. Fitness programy z pohledu kinantropologie. Praha: Galén. ISBN 9788074921155.

VOMÁČKO, S. BOŠTÍKOVÁ, S. 2003. Lezení na umělých stěnách. Praha: Grada. 129s. ISBN 8024721743.

## **Course language:**

Slovak language

## Notes:

## **Course assessment**

Total number of assessed students: 5846

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

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

**Date of last modification:** 07.02.2024

$\mathbf{U}$	<b>University:</b>	P.	J.	Šafárik	University	in	Košice
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Faculty: Faculty of Science

Course ID: ÚCHV/<br/>MUSU/22Course name: Structure determination - spectroscopic methods

#### **Course type, scope and the method: Course type:** Lecture / Practice

Recommended course-load (hours):

**Per week:** 2 / 3 **Per study period:** 28 / 42

Course method: present

**Number of ECTS credits:** 5

## Recommended semester/trimester of the course: 6.

Course level: I.

**Prerequisities:** (ÚCHV/ACHU/21 or ÚCHV/ACHU/03) and (ÚCHV/ANCHU/21 or ÚCHV/ ANCHU/03) and (ÚCHV/OCHU/21 or ÚCHV/OCHU/03)

## **Conditions for course completion:**

1. Participation in exercises in accordance with the Study Rules of PF UPJŠ.

2. Successful execution of 3 control written works on exercises after 4., 8. and 12. weeks of teaching. Obtaining a minimum grade E from seminars.

The test consists of: 1. Solution of 2 structures of unknown compounds on the basis of combined application of spectral methods. 2. Theoretical and practical questions.

Percentage rating: 100-91% (A), 90-81% (B), 80-71% (C), 70-61% (D), 60-51% (E), 50% and less FX.

### Learning outcomes:

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

### Brief outline of the course:

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

### **Recommended literature:**

1. Kováč Š., Ilavský D., Leško J.: Spektrálne metódy v organickej chémii a technológii, ALFA, Bratislava, 1987.

2. Milata V., Segl'a P.: Vybrané metódy molekulovej spektroskopie. STU BA, 2007.

3. Milata V., Segl'a P.: Spektrálne metódy v chémii. STU FCHPT Bratislava 2002.

4. Miertuš S. a kol.: Atómová a molekulová spektroskopia, ALFA, Bratislava 1991.

5. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, 5. Ed., Elsevier, 2016.

## **Course language:**

slovak, english

## Notes:

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

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Course assessment Total number of assessed students: 47						
A B C D E FX						
36.17 36.17 14.89 10.64 2.13 0.0						
<b>Provides:</b> doc. RNDr. Ján Imrich, CSc., doc. RNDr. Juraj Kuchár, PhD., RNDr. Zuzana Kudličková, PhD., RNDr. Monika Tvrdoňová, PhD.						
Date of last modification: 16.08.2022						
Approved: prof	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Pl	າD.	

University: P. J. Šafa	árik University in Košice			
Faculty: Faculty of S	Science			
Course ID: ÚINF/ SVK1/15Course name: Student scientific conference				
Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present				
Number of ECTS credits: 4				
Recommended semester/trimester of the course: 4., 6.				
Course level: I.				
Prerequisities:				

#### **Conditions for course completion:**

It is required to be registered for the participation on the Student Scientific Conference (ŠVK) in accordance to the Statute of the Student Scientific Conference at PF UPJŠ and the specific conditions for participation in a given year, which are announced by the dean of the faculty. Within one year of the ŠVK, a student or a research team can register in one track only. It is also possible to apply with a written work that is an integral part of a bachelor's or master's thesis or a result of a student support program. The written work at ŠVK is the result of the student's own work or the work of the research team. It must not show elements of academic fraud and must meet the criteria of good research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavol Jozef Šafárik University in Košice and its components. Fulfillment of the criteria is verified mainly in the process of supervision and in the process of work presentation. Failure to do so is reason for disciplinary action. The condition for the evaluation is a successful presentation and defense of the work in the relevant track headed by a commission appointed by the dean of the faculty. The commission decides on the eligibility of credits and states its decision in the memorandum of the ŠVK.

#### Learning outcomes:

The student demonstrates mastery of extended theory and professional terminology of the field of study, acquisition of knowledge, skills and competences, the ability to apply them creatively in solving selected field problems, ability to present the results using appropriate presentation methods and tools and ability to actively participate in a professional discussion.

#### **Brief outline of the course:**

- 1. Analysis of the state of the art in the field.
- 2. Design and implementation of a solution to the researched problem.
- 3. Evaluation of achieved results.
- 4. Preparation of work annotation.
- 5. Processing the written work.
- 6. Preparation of results presentation.
- 7. Presentation and defense of the obtained results.

### **Recommended literature:**

The recommended literature is specified individually by the student or research team in	
agreement with the consultant or the supervisor.	

# **Course language:**

Slovak or english

## Notes:

# Course assessment

Total number of assessed students: 182

А	В	С	D	Е	FX	
100.0	0.0	0.0	0.0	0.0	0.0	
Provides:						
Date of last modification: 25.01.2022						

University: P. J. Šafá	rik University in Košice					
<b>Faculty:</b> Faculty of S	cience					
Course ID: ÚCHV/ SVKB/04	se ID: ÚCHV/ Course name: Students Scientific Conference 3/04					
Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present					
Number of ECTS cr	edits: 4					
Recommended seme	ster/trimester of the cours	e:				
Course level: I.						
Prerequisities:						
<b>Conditions for course completion:</b> Present the results of student's work at the Student Scientific Conference and answer questions from committee members and others present.						
<b>Learning outcomes:</b> The student will acquire competences for independent scientific work in the laboratory, for analysis and written processing of obtained results and knowledge. By presenting the obtained results, the student prepares to present the obtained results in the defense of the bachelor's thesis and in front of the professional public at scientific conferences.						
Brief outline of the course:						
Recommended literature:						
Course language:						
Notes:						
Course assessment Total number of assessed students: 12						
	abs n					
	100.0	0.0				
Provides:	Provides:					
Date of last modification: 22.07.2022						
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J. Šafán	University: P. J. Šafárik University in Košice							
Faculty: Faculty of S	cience							
<b>Course ID:</b> ÚFV/ DGS/21	Course name: Students` Digital Literacy							
Course type, scope a Course type: Practic Recommended cour Per week: 2 Per stu Course method: pre	Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of ECTS cro	edits: 2							
Recommended seme	ster/trimester of the course: 1.							
Course level: I.								
Prerequisities:								
Conditions for cours Summary evaluation 1. Practical ongoing a 3. Active participation absences allowed) and assignments)	e completion: based on ongoing assessment: assignments and their defense (at least 50% needed) on during face-to-face contact learning in classical or virtual classroom (3 nd during online learning (no absence, uploading all individual ongoing							
Learning outcomes: The student should of digital technologies (i 1. according to the cu 2. for better and mor learning and further c	btain and know to apply basic knowledge and skills in working with current mobile phone, tablet, laptop, web technologies): rrent European framework for the Digital competence DigComp and ECDL e effective learning, work and active life in higher education, later lifelong areer prospects.							
Brief outline of the c 0102. Basic digital s - modern web browse - security, privacy, res 0305. Search, collec - scanning, audio recc - digital notebooks (C - evaluation of digital 0608. Editing and cr - cloud and interactiv (text and spreadsheet - work with pdf docur (Kami, Google books 09 10. Organization - modern LMS and cl (Google Classroom, I - time management (C 1113. Digital comm	ourse: skills, DigComp framework, ECDL er and its personalization sponsible use of DT etion and evaluation of digital content ording and speech resolution, optical resolution (OCR) Google keep, Evernote, Onenote) resources (Google forms and sections) reating digital content e documents editors - Google, Microsoft, Jupyter) ments, e-books and videos b, Screencasting) n, protection and sharing of digital content oud storage Microsoft team, Google Drive, Dropbox) Google Calendar) unication and cooperation							

- collaborative interactive whiteboards (Jamboard, Whiteboard)

- online presentations and online meetings

(Google presentations, Powerpoint, Google meet, Microsoft teams)

## **Recommended literature:**

1. Carretero Gomez, S., Vuorikari, R. and Punie, Y., DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, Luxembourg, 2017, ISBN 978-92-79-68006-9, https://www.ecdl.sk/

2. Bruff, D. (2019). Intentional Tech: Principles to Guide the Use of Educational Technology in College Teaching (1st edition). Morgantown: West Virginia University Press.

3. Baker, Y. (2020). Microsoft Teams for Education. Amazon Digital Services.

4. Miller, H. (2021). Google Classroom + Google Apps: 2021 Edition. Brentford: Orion Edition Limited.

## **Course language:**

slovak

Notes:

110105.						
Course assessm	nent					
Total number o	f assessed studen	ts: 245				
A B C D E FX					FX	
76.33 5.31 2.86 0.0 14.69 0.82						
Provides: doc. RNDr. Jozef Hanč, PhD.						
Date of last modification: 26.01.2022						
Approved: prot	f. RNDr. Vladimí	r Zeleňák, DrSc.	, prof. RNDr. Sta	nislav Krajči, Ph	D.	

University: P. J. Šafárik University in Košice					
Faculty: Faculty of Science					
Course ID: ÚTVŠ/       Course name: Summer Course-Rafting of TISA River         LKSp/13       Course name: Summer Course-Rafting of TISA River					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of ECTS credits: 2					
Recommended semester/trimester of the course:					
Course level: I., II., P					
Prerequisities:					
Conditions for course completion: Completion: passed Condition for successful course completion: - active participation in line with the study rule of procedure and course guidelines - effective performance of all tasks: carrying a canoe, entering and exiting a canoe, righting a canoe, paddling					
Learning outcomes: Content standard: The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature. Performance standard: Upon completion of the course students are able to meet the performance standard and: - implement the acquired knowledge in different situations and practice, - implement basic skills to manipulate a canoe on a waterway, - determine the right spot for camping, - prepare a suitable material and equipment for camping.					
Brief outline of the course:Brief outline of the course:1. Assessment of difficulty of waterways2. Safety rules for rafting3. Setting up a crew4. Practical skills training using an empty canoe5. Canoe lifting and carrying6. Putting the canoe in the water without a shore contact7. Getting in the canoe8. Exiting the canoe9. Taking the canoe out of the water10. Steeringa) The pry stroke (on fast waterways)b) The draw stroke					

11. Capsizing

12. Commands

### **Recommended literature:**

1. JUNGER, J. et al. Turistika a športy v prírode. Prešov: FHPV PU v Prešove. 2002. ISBN 8080680973.

Internetové zdroje:

1. STEJSKAL, T. Vodná turistika. Prešov: PU v Prešove. 1999.

Dostupné na: https://ulozto.sk/tamhle/UkyxQ2IYF8qh/name/Nahrane-7-5-2021-v-14-46-39#! ZGDjBGR2AQtkAzVkAzLkLJWuLwWxZ2ukBRLjnGqSomICMmOyZN==

#### **Course language:**

Slovak language

#### Notes:

#### Course assessment

Total number of assessed students: 232

abs	n
36.64	63.36

Provides: Mgr. Dávid Kaško, PhD.

**Date of last modification:** 29.03.2022

University: P. J. Safárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ KP/12	Course name: Survival Course
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II., P	
Prerequisities:	
<ul> <li>Conditions for course completion:</li> <li>Completion: passed</li> <li>Condition for successful course completion: <ul> <li>active participation in line with the study rule of procedure and course guidelines,</li> <li>effective performance of all the tasks defined in the course syllabus</li> </ul> </li> <li>Learning outcomes: <ul> <li>Content standard:</li> <li>The student demonstrates relevant knowledge and skills in the field, which content is defined in the course syllabus and recommended literature.</li> <li>Performance standard:</li> <li>Upon completion of the course students are able to meet the performance standard and should: <ul> <li>acquire knowledge about safe stay and movement in natural environment,</li> <li>obtain theoretical knowledge and practical skills to solve extraordinary and demanding situations connected with survival and minimization of damage to health,</li> <li>be able to resist and face situations related to overcoming barriers and obstacles in natural environment,</li> <li>be able implement the acquired knowledge as an instructor during summer sport camps for children and wouth within recreational sport</li> </ul> </li> </ul></li></ul>	
<ul> <li>Brief outline of the course:</li> <li>Brief outline of the course:</li> <li>1. Principles of conduct and safety in the movement in unfamiliar natural environment</li> <li>2. Preparation and guidance of a hike tour</li> <li>3. Objective and subjective danger in the mountains</li> <li>4. Principles of hygiene and prevention of damage to health in extreme conditions</li> <li>5. Fire building</li> <li>6. Movement in the unfamiliar terrain, orientation and navigation</li> <li>7. Shelters</li> <li>8. Food preparation and water filtering</li> <li>9. Rappelling, Tyrolian traverse</li> <li>10. Transport of an injured person, first aid</li> </ul>	

### **Recommended literature:**

1. JUNGER, J. et al. Turistika a športy v prírode. Prešov: Fakulta humanitných a prírodných vied PU v Prešove. 2002. 267s. ISBN 80-8068-097-3.

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53.8

PAVLÍČEK, J. Člověk v drsné přírodě. 3. vyd. Praha: Práh. 2002. ISBN 8072520598.
 WISEMAN, J. SAS: příručka jak přežít. Praha: Svojtka & Co. 2004. 566s. ISBN 8072372807.

#### **Course language:**

Slovak language

#### Notes:

### Course assessment

Total number of assessed students: 461

abs

46.2

Provides: Mgr. Ladislav Kručanica, PhD.

Date of last modification: 16.05.2023
University: P. J. Šafán	ik University in Košice					
Faculty: Faculty of Science						
Course ID: ÚINF/ SLO1a/15	Course name: Symbolic logic					
Course type, scope at Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre	Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present					
Number of ECTS cro	edits: 5					
Recommended seme	ster/trimester of the course: 6.					
Course level: I.						
Prerequisities:						
Conditions for cours Knowledge of studied	e completion: I notions will be evaluated.					
<b>Learning outcomes:</b> To understand basic n	otions of symbolic logic.					
<ul> <li>Brief outline of the contract of the</li></ul>	burse: bols h tion models ons sic proving system connections fiers ture:					
Recommended litera 1. Krajči S., https://ic 2. Goldstern M., Juda Logic, A K Peters, W	ture: s.upjs.sk/~krajci/skola/vyucba/ucebneTexty/logika-stromy.pdf h H.: The Incompleteness Phenomenon, A New Course in Mathematical ellesley, Massachusetts, 1995					
<b>Course language:</b> Slovak						
Notes:						

Course assessn Total number o	nent f assessed studen	ts: 447			
А	В	С	D	E	FX
29.31	10.96	11.86	10.51	25.06	12.3
Provides: prof. RNDr. Stanislav Krajči, PhD.					
Date of last modification: 04.01.2022					
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					

University: P. J.	University: P. J. Šafárik University in Košice					
Faculty: Faculty	of Science					
Course ID: KPE/ Course name: Teachers' Support Groups SSU/15						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present						
Number of ECT	<b>S credits:</b> 2					
Recommended	semester/trimes	ster of the cours	<b>e:</b> 6.			
Course level: I.,	II.					
Prerequisities:						
Conditions for o	course completi	on:				
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	je:					
Notes:	Notes:					
Course assessment Total number of assessed students: 65						
A B C D E FX						
83.08	83.08 9.23 6.15 0.0 0.0 1.54					
Provides: doc. PaedDr. Renáta Orosová, PhD.						
Date of last modification: 12.03.2024						
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J.	University: P. J. Šafárik University in Košice						
Faculty: Faculty	y of Science						
Course ID: KPPaPZ/TIMPF	Course ID:     Course name: Team Work       PPaPZ/TIMPR/25     Course name: Team Work						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of EC	<b>ΓS credits:</b> 4						
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4., 6.				
Course level: I., P							
Prerequisities:							
<b>Conditions for</b>	course completi	on:					
Learning outco	mes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 0							
А	A B C D E FX						
0.0	0.0 0.0 0.0 0.0 0.0 0.0						
Provides: PhDr. Anna Janovská, PhD.							
Date of last modification: 04.02.2025							
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.							

University: P. J.	University: P. J. Šafárik University in Košice					
Faculty: Faculty	y of Science					
Course ID: KPI TVE/08	Course ID: KPE/ Course name: Theory of Education TVE/08					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present						
Number of EC	TS credits: 2					
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4., 6.			
<b>Course level:</b> I.						
Prerequisities:						
Conditions for	course completi	on:				
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
Course assessment Total number of assessed students: 692						
А	A B C D E FX					
44.94	44.94 29.91 16.33 5.06 1.88 1.88					
Provides: Mgr. Beáta Sakalová, PhD., Mgr. Zuzana Vagaská, PhD.						
Date of last modification: 12.03.2024						
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.						

University: P. J. Šaf	árik University in Košice
Faculty: Faculty of	Science
<b>Course ID:</b> ÚINF/ TYS1/15	Course name: Typographical systems
Course type, scope Course type: Pract Recommended cou Per week: 2 Per st Course method: pu	and the method: ice irse-load (hours): udy period: 28 resent
Number of ECTS c	redits: 2
Recommended sem	ester/trimester of the course: 6.
Course level: I., N	
Prerequisities:	
<b>Conditions for cour</b> Satisfiable ability to	rse completion: correct mainly mathematical typesetting.
<b>Learning outcomes</b> To provide the ba mathematical formu	: asic information on principles for typesetting of documents containing las.
<ol> <li>Principles for typ</li> <li>Typesetting of a p</li> <li>TeX macros.</li> <li>Enumerations in the pages.</li> <li>Typesetting of ma</li> <li>Making tables and</li> <li>Definitions, theor</li> <li>Contents, bibliog</li> <li>Pictures.</li> <li>1012. Project.</li> </ol>	esetting of documents containing mathematical formulas. Jain text, special text symbols, using of text fonts.3 text and footnote command. Parameter setting determining the appearance of thematical formulas in text and displays, aligning formulas. d pictures. rems, and proofs in a mathematical document. raphy, sections in a document.
Recommended liter 1. D. E. Knuth, The Massachusetts, 1986 2. M. Doob, Jemný TeX" (text vo¾ne p 3. O. Ulrych, AMS- 4. J. Chlebíková, AM 5. M. Spivak, The Je 6. L. Lamport, LaTe 7. L. Lamport, Make 8. J. Rybièka, LaTe 9. H. Partl, E. Schle	<ul> <li>ature: TeXbook, Computers and Typesetting, Addison-Wesley, Reading, 5.</li> <li>úvod do TeXu, CSTUG, 1990; èeský preklad z "A Gentle Introduction to rístupný v CTAN archíve).</li> <li>TeX za 59 minút, (verzia 1.0), Praha, 1989.</li> <li>MS-TeX (verzia 2.0), Bratislava, 1992.</li> <li>by of TeX, Amer. Math. Soc., 1986.</li> <li>EX: A Document Preparation System, Addison-Wesley, Massachusetts, 1986.</li> <li>EIndex: An index processor for LaTeX, 17 February 1987.</li> <li>K pro začátečníky, Konvoj, Brno, 1995.</li> <li>gl, I. Hyna, P. Sýkora, LaTeX – Stručný popis.</li> </ul>

10. T. Oetiker, H. Partl, I. Hyna, E. Schlegl, M. Kocer, P. Sýkora, Ne příliš stručný úvod do systému LaTeX2e (neboli LaTeX2e v 73 minutách).

11. M. Goossens, F. Mittelbach, and A. Samarin, The LaTeX Companion, Addison-Wesley, Reading, Massachusetts, 1994. Kapitola 8 je volne prístupná v TeX archívoch (ch8.pdf). 4 12. G. Grätzer, Math into LaTeX, 3rd edition, Birkhäuser, Boston, 2000.

Course language: Slovak.					
Notes:					
Course assessm Total number of	nent f assessed studen	ts: 264			
А	В	С	D	Е	FX
50.0	17.05	19.7	6.06	6.44	0.76
Provides: prof. RNDr. Stanislav Krajči, PhD.					
Date of last modification: 08.01.2022					
Approved: prof. RNDr. Vladimír Zeleňák, DrSc., prof. RNDr. Stanislav Krajči, PhD.					