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Faculty: Faculty of Science

Course ID: ÚINF/	Course name: Advanced programming in Python
PPPy/18	

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: 6., 8.

Course level: I., N

Prerequisities: ÚINF/PAZ1a/15

Conditions for course completion:

At least 50 % of the marks in the continuous assessment

A minimum of 50 % marks in the mid-term and end-of-semester practical tests

or

The final project - 100%

Learning outcomes:

Implement solutions to selected problems in Python using available modules. Use and implement non-trivial algorithms to solve selected problems. Use an object-oriented approach to problem solving. Program in Python in an object-oriented manner using Python specifics. Test programs. Implement parallel computing.

Brief outline of the course:

1. Introduction to the environment, basic features of Python, simple and structured data types.

2. Input, output, function definition, lambda function, generator notation, function as parameter, string formatting.

3. Control structures, iterating over data structures, context manager.

4. Exception handling and exception raising. Philosophy of exceptions in Python.

5. Working with files. Serialization and deserialization of data - json and pickle protocol. Text and binary files. Manipulation with files. Open data.

6. Object-oriented programming 1. Design of custom classes, special methods, properties, philosophy of accessing methods and attributes.

7. Object-oriented programming 2. Comparison and differences with Java. Multiple inheritance.

8. Method overloading. Static methods, abstract classes, data class.

9. Decorators, memoization, modules, packages.

10. Code validation (debugging), testing (doctest, unittest), test-driven development.

11. Parallel computing, processes, process triggering and inter-process communication (shared variable, pipe, queue).

12. Graphical program design and implementation.

Recommended literature:

PILGRIM, Mark. Dive into Python 3. 2. United States of America: Apress, 2004. ISBN 978-1430224150. Dostupné také z: https://diveintopython3.net/

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

LOTT, Steven F. Mastering Object-oriented Python. Birmingham B3 2PB, UK: Packt Publishing, 2014. ISBN 978-1-78328-097-1.

Course language:

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

Notes:

Course assessment	
Total number of assessed students: 59	

А	В	С	D	Е	FX
8.47	13.56	16.95	18.64	23.73	18.64

Provides: PaedDr. Ján Guniš, PhD., doc. RNDr. Ľubomír Šnajder, PhD.

Date of last modification: 10.02.2022

University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of S	Science				
Course ID: 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 credits: 4					
Recommended seme	ester/trimester of the course: 6.				
Course level: I., N					
Prerequisities: ÚINI	F/PAZ1a/15 and ÚINF/PAZ1b/15				
Conditions for cours Practice activities, he Final examination co	se completion: omeworks and midterm exam. onsisting of practice and theoretical test.				
Learning outcomes: 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 Indergraduate 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/ ures: 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: 164					
А	В	С	D	Е	FX
13.41	4.88	17.68	23.17	37.8	3.05
Provides: RNDr. Rastislav Krivoš-Belluš, PhD.					
Date of last modification: 08.01.2022					
Approved:					

University in Solution University in Rusie
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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: 6., 8.

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: 874

А	В	С	D	Е	FX
26.2	18.19	23.57	17.39	9.84	4.81

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

Date of last modification: 23.11.2021

University: P. J. Šafárik University in Košice					
Faculty: Faculty of Science					
Course ID: ÚINF/ Course name: Automata and formal languages					
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: 5., 7.					
Course level: I.					
Prerequisities: ÚINF/AFJ1a/15					
Conditions for course completion: Test and oral examination.					
Learning outcomes: To provide theoretical background for studying computer science in general, by giving the necessar knowledge in theory of automata.					
 Brief outline of the course: Pushdown automata: definition of a pushdown automaton, accepting by final states, accepting by empty pushdown Deterministic pushdown automata: examples of application in practice Context-free grammars: basic definition, leftmost derivation, derivation tree, elimination of rule of type A→epsilon and A→B, Chomsky normal form Relation between context-free grammars and pushdown automata: transforming context-free grammar to a pushdown automaton, transforming pushdown automaton to a context-free grammar 5: Pumping lemma I: Statement of the lemma and its proof Pumping lemma II: applications of the lemma Closure properties of context-free languages Closure properties of deterministic context-free languages Closure properties of deterministic context-free languages Closure properties of context-sensitive grammar, nondeterministic linear-bounded Turing machine (LBA), transforming context-sensitive grammar to an LBA, transforming LBA ta context-sensitive grammar Closure properties of context-sensitive languages Recursively enumerable languages: phrase-structure grammar, nondeterministic an deterministic Turing machine, transforming nondeterministic Turing machine to a phrase-structure grammar to a deterministic Turing machine, closur properties Universal Turing machine Algorithmically undecidable problems of the formal language theory 					

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: 579

А	В	С	D	Е	FX
37.82	16.58	19.52	17.44	6.04	2.59
Providen und DNDr Vilian Coffert DrSe, DNDr Juni Čehci, DhD					

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	Faculty: Faculty of Science					
Course ID: ÚINF/ BPO/14	Course name: Bachelor Thesis and its Defence					
Course type, scope a Course type: Recommended cou Per week: Per stud Course method: pre	nd the method: rse-load (hours): ly period: esent					
Number of ECTS cr	edits: 4					
Recommended seme	ster/trimester of the course:					
Course level: I.						
Prerequisities:						
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 to 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.					
Learning outcomes: The bachelor's thesis of the field of study, declared profile of the in solving selected f student demonstrates ethical. Further detai requirements of fina 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.					
 3rief 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 litera The recommended literation bachelor's thesis.	Ature: terature is determined individually in accordance with the topic of the					
Course language: Slovak and optionally	y English.					
Notes:						

Course assessm Total number o	nent f assessed studen	ts: 122				
А	В	С	D	Е	FX	
45.08	28.69	12.3	8.2	5.74	0.0	
Provides:						
Date of last modification: 28.11.2021						
Approved:						

University: P. J. Šafárik University in Košice							
Faculty: Faculty of Science							
Course ID: ÚINF/ VKN1/22	Course name: Computational and cognitive neuroscience I						
Course type, scope a Course type: Lectur Recommended cour 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	edits: 5						
Recommended seme	ster/trimester of the course: 3., 5.						
Course level: I., N							
Prerequisities:							
Conditions for cours Midterm exam Final exam consisting	e completion: g of written and/or oral part						
Learning outcomes: Overview anatomy, computational aspect	physiology, and cognitive processes in the human brain with focus on s of cognition and computational tools used in neuroscience.						
 Brief outline of the c 1. Intro to neural and 2. Overview of anato 3. Methods of study i 4. Neuron: anatomy, 7 5. Propagation of sign 6. Synaptic transmiss 7. Psychology of mer 8. Vision: Intro. Percesitance. 9. Hearing and audito 10. Language, psychoo 11. Attention. 12. Crossmodal intera 13. Reasoning and de 	ourse: cognitive science my and physiology of the central nervous system (CNS) n neuroscience. Sensory, motor and associative brain areas. types, action potential hals in the neuron, neural coding. ion and plasticity - neural basis of learning and memory. nory and learning. eeption of brightness, edges, color. Model BCS/FCS. Perception of size and ory cognition. blinguistics, speech perception and production. action (vision, hearing, touch). exision making.						
Recommended litera 1. Poeppel D., Mangu 2020. ISBN-13: 978- 2. Dayan P and LF A Modeling of Neural S 3. Thagard P: Mind: 1 ⁽⁹⁷⁸⁻⁰²⁶²⁷⁰¹⁰⁹⁹	Ature:an G., Gazzaniga M. (ed.): The Cognitive Neurosciences. 6th ed. MIT Press.0262043250bbott: Theoretical Neuroscience - Computational and MathematicalSystems. MIT Press, 2005 ISBN-13: 978-0262541855Introduction to Cognitive Science, 2nd Edition. Bradford Books. ISBN-131:						

Course language:

Slovak or Engli	Slovak or English					
Notes: Content prerequ Algebra, progra	Notes: Content prerequisites: Algebra, programming (Matlab).					
Course assessment Total number of assessed students: 28						
А	В	С	D	Е	FX	
21.43	21.43	25.0	25.0	3.57	3.57	
Provides: doc. Ing. Norbert Kopčo, PhD., Ing. Peter Lokša, PhD., RNDr. Keerthi Kumar Doreswamy						
Date of last modification: 14.02.2022						
Approved:						

	COURSE INFORMATION LETTER				
University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of Science					
Course ID: ÚINF/ PSIN/15	ourse ID: ÚINF/ Course name: Computer network Internet SIN/15				
Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 1 Per Course method: pre	and the method: re / Practice rse-load (hours): study period: 42 / 14 esent				
Number of ECTS cr	edits: 5				
Recommended seme	ester/trimester of the course: 2.				
Course level: I., N					
Prerequisities: ÚINF	/PAZ1a/15 or ÚINF/PRG1/15				
Conditions for cours Activity at excercises Verbal exam (min 25	se completion: s (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.				
the principles of ISO/ the meaning and usage communication channer They will understand principle of routing principle of routing principle acknowledged TCP the interface of UDP and protocols of the Interpret	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). I 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 I TCP protocols in a program code. They will understand the basic application rnet.				
 Brief outline of the c 1. Introduction to comnetworks, ISO OSI re 2. Application layer: 3. Application layer: networks. 4. Transport layer: set 5. Transport layer: set 5. Transport layer: co 6. Network Layer: fragmentation, routin 7. Network Layer: ne 8. Network Layer: ro 9. Link layer: error 	nputer networks, internet connection types, delay and loss in packet-switched eference 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 ervices, multiplexing and demultiplexing, protocol UDP, reliable data transfer onnection oriented transport protocol TCP, flow and congestion control. Internet protocol IPv4, virtual circuit and datagram networks, packet ag table, application protocol DHCP etwork address translation NAT, ICMP protocol, internet protocol IPv6 outing algorithms and protocols, broadcast and multicast routing				

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: 814

А	В	С	D	Е	FX
9.58	5.28	12.53	16.34	36.24	20.02

Provides: RNDr. Peter Gurský, PhD., RNDr. JUDr. Pavol Sokol, PhD.

Date of last modification: 04.01.2022

	University: P. J. Šafárik University in Košice				
Faculty: Faculty of Sci	ence				
Course ID: ÚINF/ C KOPR/19	Course name: Concurrent programming				
Course type, scope and Course type: Lecture Recommended course Per week: 1 / 2 Per st Course method: prese	d the method: / Practice e-load (hours): tudy period: 14 / 28 ent				
Number of ECTS cred	lits: 4				
Recommended semest	er/trimester of the course: 7.				
Course level: I.					
Prerequisities: ÚINF/P	PAZ1a/15				
Conditions for course Creation and defense o second one in area of d	completion: of given final projects. First project in area of parallel programming and the listributed programming.				
Students will acquire to cooperation and synchrical thread of the graphical based on Reactor's react the actor model, coordin RabbitMQ and Apache	the ability to practically create thread-safe programs, design solutions for ronization of threads, correctly terminate the work of threads, coordinate the l user interface with working threads, to create high-throughput programs ctive current structures, to create distributed program architectures based on inate the work of a distributed system through the Message Broker systems e Kafka and to create and use SOAP web services.				
Brief outline of the cou 1, SOAP: From web se 2, SOAP: From WSDL 3, Thread programming 4, Thread programming 5, Thread programming 6, Thread programming 7, Thread programming 8, Thread Programming 9, Thread programming 10, Thread programming 11, Thread Programming 12, Reactive programming 13, Reactive programming 14, Reactive programming 15, Reactive programming 16, Actor model: Design	urse: rvice to WSDL. JAX-WS 2.0. SoapUI tool. . to Web Service. Creating WSDL in Eclipse. Generating server code. g: Introduction to threads g: Race conditions and atomicity of objects state g: Composition of thread-safe classes g: Concurrent collections g: Threads coordination, synchronizers g: Executors g: ForkJoinPool - work stealing design pattern ng: Termination of tasks, threads and executors ng: Threads in JavaFx ning: Reactive stream functions ning: Stream generation, error handling, stream termination ning: Design of reactive programs, reactive communication with a database ning: WebFlux - reactive programming on the web gn of actors and communication between them				

20, Message Brokers: RabbitMQ - complex message routing, failover, structured messages, message acknowledgment

21, Message Brokery: Apache Kafka

Recommended literature:

1. GOETZ, Brian. Java concurrency in practice. Upper Saddle River, NJ: Addison-Wesley, c2006. ISBN 9780321349606.

2. HYDE, Paul. Java thread programming. Indianapolis, Ind.: Sams Pub., c1999. ISBN 0672315858.

3. WHITE, Tom. Hadoop: the definitive guide. 3rd ed. Sebastopol: O'Reilly, 2012. ISBN 978-1-449-31152-0.

4. Project Reactor documentation. Available online: https://projectreactor.io/docs

5. Project Akka documentation. Available online:

6. Project RabbitMQ documentation. Available online: https://www.rabbitmq.com/documentation.html>

7. Project Apache Kafka documentation. Available online: https://kafka.apache.org/documentation/

Course language:

Slovak

Notes:

Content prerequisites: It is necessary to have mastered the basics of programming in Java in the scope of PAZ1a. There is an advantage if students know the JavaFX framework and Rest API in the range of PAZ1c.

Course assessment

Total number of assessed students: 86

А	В	С	D	Е	FX
41.86	25.58	18.6	10.47	3.49	0.0

Provides: RNDr. Peter Gurský, PhD., RNDr. Róbert Novotný, PhD.

Date of last modification: 04.01.2022

University: P. J. Šafá	rik University in Košice					
Faculty: Faculty of S	Faculty: Faculty of Science					
Course ID: 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.					
 Brief outline of the c 1) Relational databas 2) Data types, operate 3) JOIN operations. 4) AGGREGATION 5) Data and database 6) DB design, ER dia 7) System commands 8) Nested queries. RO 9) Three-valued logic 10) Data science and 11) Data warehouses. 12) Normalization of 	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 languag Slovak or Engli	ge: ish				
Notes:					
Course assessm Total number of	nent f assessed studen	ts: 891			
А	В	С	D	E	FX
11.11	9.54	17.4	22.67	32.21	7.07
Provides: doc.]	RNDr. Csaba Tör	ök, CSc., RNDr	. Lukáš Miňo, Ph	D.	
Date of last mo	dification: 08.01	.2022			
Approved:					

University: P. J. Safái	University: P. J. Safarik University in Kosice					
Faculty: Faculty of S	Faculty: Faculty of Science					
Course ID: ÚINF/ DBS1b/15	ourse ID: UINF/ Course name: Database systems BS1b/15					
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					
Recommended seme	ster/trimester of the course: 4					
Course level: I						
Prerequisities: ÚINF	/DBS1a/15					
Conditions for cours Demonstration of ade 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 relational databases, t with non-relational databases	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 integr 6) XML documents a 7) Functional depend 8) The latest normal f 9) Big data and NoSC 10) MongoDB, CRUI 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. nd their querying. JSON. encies and NF. form - ETNF. QL. D and cursors. I indices. harding.					
Recommended litera - Date C.J., Database - I. Ben-Gan, D. Sark	ture: 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: 749

А	В	С	D	Е	FX
9.61	8.14	12.42	24.43	35.11	10.28

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

Date of last modification: 08.01.2022

University: P. J. Šafá	rik University in Košice						
Faculty: Faculty of Science							
Course ID: ÚINF/ VMA1/21	Course name: Development of mobile applications						
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: 4						
Recommended seme	ster/trimester of the course: 6., 8.						
Course level: I.							
Prerequisities:							
Conditions for cours Active participation presenting technical a	e completion: in course chat. Implementing and delivering a complex mobile app and approach and implementation in a public demo.						
Learning outcomes: Student is able to dev and is able to program	elop and deliver mobile apps on Android. She knows platform-specic features n in Kotlin.						
 Brief outline of the c Principles and spear and event handling. Widget layout for between activity restars. List widget. Recyce ViewModels as a s Using SQL for per Internet communication of the communication of the second second	 bourse: <						
Recommended litera 1. Mark L. Murphy: 7 2009. ISBN: 978-098 2. W. Frank Ableson, Edition. Manning, 20 3. Bill Philips, Christ Guide. Big Nerd Ran	nture: The Busy Coder's Guide to Android Development. CommonsWare, LLC, 81678009 Robi Sen, Chris King and C. Enrique Ortiz: Android in Action Third 011. ISBN 9781617290503 Stewart, Kristin Marsicano: Android Programming: The Big Nerd Ranch ch Guides. ISBN 978-0134706054						
Course language:							

Slovak or English

Notes:

Content prerequisities: Java programming skills. Object-oriented programming proficiency. Basic experience in concurrent and thread programming.

Course assessment Total number of assessed students: 87 С А В D Е FX 54.02 4.6 14.94 17.24 4.6 4.6 Provides: RNDr. Miroslav Opiela, PhD., RNDr. Róbert Novotný, PhD. Date of last modification: 23.11.2021 Approved:

COURSE INFORMATION LETTER								
University: P. J. Šafá	rik University in Košice							
Faculty: Faculty of S	Faculty: Faculty of Science							
Course ID: ÚMV/ DSM3a/10	Course name: Discrete mathematics for informaticians							
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 14 esent edits: 4							
Recommended seme	ster/trimester of the course: 3.							
Course level: I.								
Prerequisities:								
Course evaluations cortest (for 30 points) and During the semester is solving bonus homew of 100 points). Evaluation: 100 - 90p: A, 89.5 - 8	onsists of small tests (5x2 points), 2 semestral tests (each for 20 points), exam ad oral exam (for 20 points). t is possible to get an additional 10 bonus points for activity on classes or for work, respectively (these points are extra and they do not count to maximum 80p: B, 79.5 - 70p: C, 69.5 - 60p: D, 59.5 - 50p: E, 49.5p and less: Fx							
Learning outcomes: To present the basics completion of the co calculating different t basic principles of se	of combinatorics and their applications in computer science. After successful burse, the student should understand the basic principles of combinatorics, ypes of configurations, understand the basic concepts of graph theory and the lected graph algorithms, usage of graphs for solving the real life problems.							
Brief outline of the c Mathematical induct k-permutations, com Recurrent equations. graphs, shortest path	ourse: ion and Dirichlet principle. The sum and the product rule. Permutations, binations. Selections with repetitions. The inclusion/exclusion principle. Introduction to graph theory. Trees and spanning trees. Search algorithms in algorithms. Eulerian and Hamiltonian graphs. Planar graphs. Graph colorings.							
Recommended litera 1. S. Jendrol', P. Miho 2. J. Nešetřil, J. Mato 3. E. R. Scheinerman Grove 2000. 4. R.P. Grimaldi: Dise 1994.	ture: bk: Diskrétna matematika I., UPJŠ Košice 1992 ušek: Kapitoly z diskrétni matematiky : Mathematics - a discrete introduction, Brooks/Cole Publ. Comp. Pacific crete and Computational Mathematics, Addison-Wesley Publ. CoRending							

Course	language:
Clavalr	or English

Slovak or English

Notes:

Course assessment Total number of assessed students: 300							
A B C D E FX							
7.0	3.33	8.67	16.33	51.67	13.0		
Provides: prof. RNDr. Tomáš Madaras, PhD., Mgr. Daniela Matisová							
Date of last modification: 16.04.2022							
Approved:							

University: P. J. Šafá	rik University in Košice					
Faculty: Faculty of Science						
Course ID: ÚINF/ FUN1/21	Course name: Functional programming					
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 cro	edits: 3					
Recommended seme	ster/trimester of the course: 7.					
Course level: I.						
Prerequisities:						
Conditions for cours Evaluation of active project.	e completion: participation in exercises and evaluation of homeworks. Work on a semester					
Learning outcomes: To learn bases of decl and basic methods of	arative programming (as complementary method to procedural programming) implementations of functional programming language Haskell.					
 Brief outline of the c 1. Introduction to fun 2. Types, types of typ 3. Syntax and the mo 4. Recursion 5. Lists 6. Data analysis 1. 7. Data analysis 2. 8. Data analysis 3. 9. Graphic outputs 10. Functions of high 11. Creating your ow 12. Monads 	ourse: ctional programming es, type variables st important specifics of the Haskell language er ranks n types					
Recommended litera ABELSON, H. a G. J Cambridge: MIT Pres LIPOVAČA, Miran. Starch Press, 2011. IS O'SULLIVAN, Bryan 'Reilly, 2008. ISBN 9	ture: . SUSSMAN. Structure and interpretation of computer programs. ss, 2002. ISBN 0-262-01153-0. Learn you a haskell for great good!: a beginner's guide. San Francisco: No SBN 978-1-59327-283-8. n, Don STEWART a John GOERZEN. Real world Haskell. Beijing: O 978-0-596-51498-3.					
Course language: Slovak or English						

Notes:

Course assessment Total number of assessed students: 68							
A B C D E FX							
36.76	19.12	14.71	17.65	11.76	0.0		
Provides: doc. RNDr. Ondrej Krídlo, PhD.							
Date of last modification: 23.11.2021							
Approved:	Approved:						

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ ZIV1/21	Course name: Internet of Things
Course type, scope a Course type: Practic Recommended cou Per week: 3 Per stu Course method: pre	nd the method: ce rse-load (hours): dy period: 42 esent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course: 6., 8.
Course level: I.	
Prerequisities: ÚINF	7/PAZ1a/15
Conditions for cours Graded activities: sm Rules to pass the sul report. Get at least 50	completion: all assignments, final complex project. bject: Create the final project matching minimal requirements and write the 0% of points from assignments.
Learning outcomes: To get an overview an ability to design a microcontrollers, inte	in the field of Internet of Things and to understand basic concepts. To get and implement particular IoT solutions (connecting sensors and actuators to er-device communication, data processing and cloud services).
 Brief outline of the c 1. Introduction to IoT 2. Arduino, program (button, LED, potent 3. Serial communication (Arduino). 4. Digital synchronoon I2C expander, buzzen 5. Sensor data, overv 6. Application layer p 7. Node-RED, open-6 8. Raspberry PI, rem6 9. Cloud computing, 10. Machine learning evaluation. 11. Existing solutions 	ourse: , repetition of physics curriculum covering direct current, voltage divider. ming in Arduino IDE, sensors and actuators, basic components connection iometer, photoresistor). tion, UART, turtle graphics (Java) in connection with sensors and actuators us and asynchronous communication, SPI, I2C protocol, 7-segment display, and creating melodies. iew of sensor modules, smartphone sensors, filtering measured values. protocols (MQTT), overview of IoT protocols. data processing, IoT dashboard, connection with Arduino. ote access, security in IoT. AWS services dedicated to IoT. g, basic overview from the IoT point of view, focus on data preprocessing and s - projects developed by students and IT companies.
Recommended litera 1. SELECKÝ, Matúš Computer Press, 201 2. UPTON, Eben a G vydání. Přeložil Jaku 3. MONK, Simon. Pr	Arduino: uživatelská příručka. Přeložil Martin HERODEK. Brno: 6. ISBN 9788025148402. Fareth HALFACREE. Raspberry Pi: uživatelská příručka. 2., aktualizované b GONER. Brno: Computer Press, 2016. ISBN 9788025148198. Fogramming Arduino, 2. vyd, McGraw-Hill, 2016. ISBN 9781259641633

Course language:

Slovak language. English language is required for accessing AWS and other resources.

Notes:

Totes.							
Course assessment Total number of assessed students: 58							
A B C D E FX							
70.69	6.9	10.34	5.17	3.45	3.45		
Provides: RNDr. Miroslav Opiela, PhD., Mgr. Viktor Pristaš							
Date of last modification: 08.01.2022							
Approved:							

7

Г

University: P. J.	Šafárik Unive	sity in Košice						
Faculty: Faculty of Science								
Course ID: ÚIN UGR1/15	D: ÚINF/ Course name: Introduction to computer graphics							
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 ECT	'S credits: 5							
Recommended s	semester/trim	ester of the course	e: 3., 5.					
Course level: I.,	II							
Prerequisities:								
Conditions for c	ourse comple	tion:						
Learning outcom To provide the s graphics.	nes: tudents with k	nowledge of graph	nics algorithms	and basic princip	oles of computer			
Graphics hardwa drawing 2D prin spline forms, Bé perspective and Rendering techn computer animat	Brief outline of the course: Graphics hardware, input and output devices. Color models, palettes. Raster graphics algorithms for drawing 2D primitives. Filling and clipping. Curve modeling, interpolations and approximations, spline forms, Bézier curves, B-splines, surfaces. Homogenous coordinates, affine transformations, perspective and parallel projections. Visible-surface determination, illumination and shading. Rendering techniques, photorealism, textures, ray tracing, radiosity. Object representations, computer animation, virtual reality.							
Recommended literature: FOLEY, J. D., van DAM, A., FEINER, S., HUGHES, J.: Computer Graphics: Principles and Practice, Addison-Wesley, 1991 MORTENSON, M.E.: Geometric modeling, 2.ed., Willey, 1997								
Course language	e:							
Notes:								
Course assessment Total number of assessed students: 307								
Α	A B C D E FX							
13.36	10.1	14.01	23.45	30.94	8.14			
Provides: RNDr.	Rastislav Kriv	voš-Belluš, PhD., o	loc. RNDr. Joze	ef Jirásek, PhD.				
Date of last mod	lification: 08.0	01.2022						
Approved:								

University: P. J. Šafárik University in Košice							
Faculty: Faculty of S	Faculty: Faculty of Science						
Course ID: ÚINF/ UIB1/21Course name: Introduction to information security							
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	edits: 5						

Recommended semester/trimester of the course: 5.

Course level: I., N

Prerequisities:

Conditions for course completion:

The condition for passing the course is: 1. Exercise tasks (20% of the total number of points), 2. Homeworks (30% of the total number of points), 3. Written final theoretical exam (25% of the total number of points), 4. Written final practical exam (25% of the total number of points).

Learning outcomes:

The result of the education is an understanding of the basic concepts of information security from the technical, legal and procedural views of point.

Brief outline of the course:

1. Introduction to information security and information security model, 2. Information security management, 3. Risk and risk management, 4. Legal, normative and ethical aspects of information security, 5. Continuity management of activities, processes and security incidents handling, 6. Introduction to cryptology, 7. Access control, 8. Physical and environmental security, 9. Human resources security and social engineering, 10. End point security and malicious code, 11. Computer network security, 12. 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 of assessed students: 110							
A B C D E FX							
35.45	35.45 27.27 20.0 9.09 3.64 4.55						
Provides: RNDr. JUDr. Pavol Sokol, PhD., Mgr. Eva Marková							
Date of last modification: 04.01.2022							
Approved:	Approved:						

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: 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 cr	edits: 5
Recommended seme	ster/trimester of the course: 3., 5.
Course level: I., N	
Prerequisities:	
Conditions for course The condition for pa networks, successful types, and genetic alg exam.	se completion: 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 educ algorithms. The stud 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 rk with a selected tool for modeling neural networks.
Brief outline of the c 1. Basic concept arisi calculable by thresho 2. Perceptrons. Linea learning rule, higher	ng from biology. Linear threshold units, polynomial threshold units, functions old units. In separable objects, adaptation process (learning), convergence of perceptron order perceptrons.

3. Forward neural networks, hidden neurons, adaptation process (learning), backpropagation method.

4. Recurrent neural networks. Hopfield neural networks, properties, associative memory model, energy function, learning, optimization problems (business traveler problem).

5. Model of gradually created network. ART network, architecture, operations, initialization phase, recognition phase, search and adaptation phase. Use of the ART network.

6. Applications of studied models in solving practical problems.

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: 454

А	В	С	D	Е	FX
14.54	18.06	22.69	18.5	22.03	4.19

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

Date of last modification: 23.11.2021

University: P. J.	. Šafárik Univer	sity in Košice							
Faculty: Faculty of Science									
Course ID: ÚIN MZI/21	VF/ Course n	ame: Introductio	n to study of info	rmatics					
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present									
Number of ECTS credits: 5									
Recommended semester/trimester of the course: 1.									
Course level: I.									
Prerequisities:									
Conditions for Understanding	Conditions for course completion: Understanding of basic mathematical notions								
Learning outco Understanding	Learning outcomes: Understanding of basic mathematical notions								
 Brief outline of 1. Mathematica 2. Connections 3. Classes and s 4. Other operaries 5. Relations 6. Relational alg 7. Orderings 8. Equivalences 9. Functions 10. Cardinalities 11. Infinities 12. Cardinal aries 	the course: I text and quantifiers tets ions operácie gebra s thmetics								
Recommended	Recommended literature:								
https://ics.upjs.sk/~krajci/skola/vyucba/jesen/predmety/MZI.html									
Slovak	ge:								
Notes:									
Course assessment Total number of assessed students: 237									
А	В	С	D	Е	FX				
51.48	17.3	10.13	3.38	1.27	16.46				
Provides: prof. RNDr. Stanislav Krajči, PhD.									
Date of last modification: 23.11.2021

University: P. J. Šafá	árik University in Košice
Faculty: Faculty of S	Science
Course ID: ÚINF/ PAI1/21	Course name: Legal aspects of informatics
Course type, scope a Course type: Lectu Recommended cou Per week: 2 / 1 Per Course method: pr	and the method: re / Practice irse-load (hours): study period: 28 / 14 esent
Number of ECTS ci	redits: 3
Recommended seme	ester/trimester of the course: 6.
Course level: I., II.	
Prerequisities:	
Conditions for cour The condition for pa	se completion: ssing the course is the final written exam (score at least 50%).
Learning outcomes: The result of the ed of information and c aspecs of IT, intellec	ucation is an understanding of the necessary knowledge in the legal aspects communications technologies (ICT law), especially data protection, criminal tual property, information society services.
Brief outline of the 1. Introduction to in 3. Trust-building seinformation society contracts, 5. Electron data I protection of of data subjects, 7. If cookies, 8. Digital si on the Internet, 10. Intellectual property open licenses, 12. Co	course: formation technology law, 2. Electronic legal acts and electronic signature, rvices, 4. Electronic commerce I introduction to electronic commerce, services, types of electronic contracts, legal aspects of e-shops, concluding nic commerce II consumer protection, 6. Protection of privacy and personal of personality, definition of personal data, processing of personal data, rights Protection of privacy and personal data II online identifiers - IP addresses, ngle market - digital single market - geoblocking, shared economy, 9. Liability Intellectual property law I industrial property law, copyright rights, 11. law II legal aspects of computer programs, databases, license agreements, pomputer crime I., 13. Computer crime II., 14. Cyber and information security.

Recommended literature:

1. HUSOVEC, Martin, Matúš MESARČÍK a Jozef ANDRAŠKO. Právo informačných a komunikačných technológií 1. Bratislava: TINCT, 2021. ISBN 9788097383701, 2. ANDRAŠKO, Jozef, Martin DAŇKO, Petra DRAŽOVÁ, Zoltán GYURÁSZ, Matúš MESARČÍK, Rastislav MUNK a Soňa SOPÚCHOVÁ. Právo informačných a komunikačných technológií 2. Bratislava: TINCT, 2021. ISBN 9788097383725, 3. HUČKOVÁ, Regina, Diana TREŠČÁKOVÁ a Laura RÓZENFELDOVÁ. Právo informačných a komunikačných technológií. Košice: Univerzita Pavla Jozefa Šafárika v Košiciach, 2020. ISBN 9788081529108.

Course language:

Slovak

Notes:

Course assessment Total number of assessed students: 66							
А	A B C D E FX						
19.7	9.7 22.73 15.15 12.12 24.24 6.06						
Provides: RNDr. JUDr. Pavol Sokol, PhD.							
Date of last modification: 04.01.2022							
Approved:							

University: P. J	. Šafárik Univer	sity in Košice				
Faculty: Facult	y of Science					
Course ID: ÚI ZLI/21	NF/ Course name: Linux basics					
Course type, so Course type: 1 Recommender Per week: 2 P Course metho	cope and the me Practice d course-load (H er study period od: present	thod: nours): : 28				
Number of EC	TS credits: 2					
Recommended	semester/trime	ster of the cours	e: 1.			
Course level: I.	., N					
Prerequisities:						
Conditions for The condition Written final th (25% of the tot	course complet for passing the coretical exam (al number of poi	ion: course is: 1. Hon 25% of the total 1 nts).	neworks (50% o number of points	f the total numb), 3. Written fina	er of points), 2. l practical exam	
Learning outco The result of the studying compu- systems.	omes: he education is iter science, by g	an understanding iving the necessar	g of the theoretic y knowledge in the	al and practical he usage of Unix/	background for Linux operating	
Brief outline of 1. Introduction files, 5. Manag packages, 8. A Managing netw	f the course: to Unix/Linux sy ging users, group dministering the york interfaces, 1	stems, 2. Linux o os and rights, 6. system - system 1. Managing disk	mmand line, 3. To Managing proce booting, jobs, 1 partitions, 12. E	ext processing too sses, 7. Managir ogging,9. Basic exam.	ols, 4. Managing ng software and networking, 10.	
Recommended 1. LPIC-1 Exar 2021-9-22]. Do 102. LPI [onlin z: https://learnin [online]. 4. Prat k/LDP_4.pdf.	literature: n 101. LPI [onlin ostupné z: https:// e]. Canada: The ng.lpi.org/en/lea ha: Computer Pr	ne]. Canada: The /learning.lpi.org/e Linux Profession rning-materials/1 ess, 2007 [cit. 20	Linux Profession en/learning-mater nal Institute, 2021 02-500/, 3. Linux 21-9-22]. Dostup	nal Institute, 202 rials/101-500/, 2. [cit. 2021-9-22] x - Dokumentačn pné z: https://i.iin	1 [cit. LPIC-1 Exam . Dostupné í projekt fo.cz/files/root/	
Course langua Slovak or Engl	ge: ish					
Notes:	,			-		
Course assessm Total number o	nent f assessed studer	nts: 57				
А	В	С	D	Е	FX	
59.65	7.02	14.04	3.51	5.26	10.53	

Provides: RNDr. JUDr. Pavol Sokol, PhD., Mgr. Eva Marková, Mgr. Richard Staňa

Date of last modification: 04.01.2022

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ LOP1/15	Course name: Logic programming
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: 4., 8.
Course level: I., II.	
Prerequisities:	
Conditions for cours Evaluation of active j the semester. Written	e completion: participation in exercises and homework, test of theoretical knowledge during and oral exam together with assessment from exercises.
Learning outcomes: To learn bases of decl and basic methods of	arative programming (as complementary method to procedural programming) implementations of logic programming languages.
Brief outline of the c 1. Introduction to log 2. theory, models, He 3. SLD resolution 4. Basics of Prolog la 5. Prologue in examp 6. Lists 7., 8., 9. Data analysi 10., 11., 12. Graph th	ourse: ic erbrand model inguage iles s in Prolog eory in Prolog
Recommended litera BRATKO, Ivan. Prol Wesley, 1990. ISBN NILSON U., MALU NIENHUYIS-CHEN Springer-Verlag, 199	og. Programming for Artificial Intelligence. 2 ed. Wokingham: Addison- 0-201-41606-9. SINSKI J.: Logic, Programming and Prolog, John Wiley & Sons Ltd. 1995 G Sh.H., WOLF R.: Foundations of Inductive Logic Programming, 7
Course language: Slovak or English	
Notes: Prerequisites: none	

Course assessment Total number of assessed students: 304							
А	A B C D E FX						
23.68	8 13.82 14.14 23.03 23.68 1.64						
Provides: doc. RNDr. Ondrej Krídlo, PhD.							
Date of last modification: 23.11.2021							
Approved:	Approved:						

University: P. J. Šafá	rik University in Košice					
Faculty: Faculty of Science						
Course ID: ÚINF/ MTL/22	Course name: MATLAB and neurocognition					
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: 3					
Recommended seme	ster/trimester of the course: 3., 5.					
Course level: I., N						
Prerequisities:						
Conditions for cours Written quizes, midte	e completion: rm and final exam.					
Learning outcomes: Intro to programming	in MATLAB with focus on its usage in neural and cognitive Science.					
Brief outline of the c 1. Intro to Matlab 2. Navigation, interact 3. Interaction with hu 4. Auditory and visua 5. Analysis and visua 6. Analysis of neurop 7. Analysis of neuroin 8. Cognitive and neuroin 9. Auditory modeling 10. Visual modeling to 11. Tools for modelinin 12. Tools for psychol	ourse: etion, variables, vectors, matrices, scripts, toolboxes mans in behaviroal experiments al stimulus generation lization of behavioral data hysiological data maging data. ral modeling in Matlab s tools tools og of learning ogical experiments					
Recommended litera 1. Wallisch P, et al. M MATLAB. Academic 2. Stork D, Yom-Tow 2nd Edition, Wiley, 2 3. Dayan P and LF A Modeling of Neural S	Ature: IATLAB for Neuroscientists: An Introduction to Scientific Computing in Press 2008. ISBN-13: 978-0123838360 Y E: Computer Manual in MATLAB to accompany Pattern Classification, 004 ISBN-13: 978-0471429777 bbott: Theoretical Neuroscience - Computational and Mathematical Systems. MIT Press, 2005 ISBN-13: 978-0262541855					
Course language: Slovak or English						
Notes: Content prerequisities basic programing skil	s: Ils or instructor's consent					

Course assessm Total number o	nent f assessed studen	ts: 7					
А	A B C D E FX						
14.29	14.29 28.57 14.29 42.86 0.0 0.0						
Provides: doc. Ing. Norbert Kopčo, PhD., Ing. Peter Lokša, PhD., RNDr. Keerthi Kumar Doreswamy							
Date of last modification: 04.04.2022							
Approved:							

University: P. J. Šafa	árik University in Košice
Faculty: Faculty of S	Science
Course ID: ÚINF/ MIS/15	Course name: Management of information systems
Course type, scope Course type: Lectu Recommended cou Per week: 1 / 2 Per Course method: pr	and the method: ire / Practice irse-load (hours): • study period: 14 / 28 resent
Number of ECTS c	redits: 4
Recommended sem	ester/trimester of the course: 8.
Course level: I.	
Prerequisities:	
Conditions for cour Completion of the su during the semester - mastering the basic - mastering the princ - presentation and do Detailed conditions the AIS.	se completion: ubject is conditional on the completion of partial tasks within the group project in an appropriate quality. The project is aimed at: concepts and methods taught, ciples of related IT tools, efense of the created project. for evaluating partial tasks and obtaining a final evaluation are published in
Learning outcomes By completing the s - knowledge of the g organisation in relat: - knowledge of the p of the company's fur - basic knowledge at - experience of work	: ubject, students will gain general aspects of the design and use of information systems for managing the ion to the strategic goals of the organisation, principles of basic ICT technologies used to manage processes in various areas actioning, nd skills on the use of relevant IT tools, king in a heterogeneous team and with project presentation.
 Brief outline of the 1. Introduction to in 2. Organisational str 3. Managing data an 4. Business Intellige 5. Ethics and privacy 6. Information secur 7. Social computing 8. Electronic commendation 9. Wireless and mobino 10. The role of infor 11. CRM systems. 12. Management of 	course: formation systems. ategy and the role of information systems in gaining competitive advantage. d knowledge. nce. y protection. ity. erce. vile computing. mation systems within the organisation and public administration.

13: Procurement and implementation of information systems.

Recommended literature:

1. R. Kelly Rainer, Brad Prince, Hugh J. Watson, Management Information Systems, Wiley 2015, ISBN : 978-1-118-89538-2

2. Voříšek, J.: Strategické řízení informačního systému a systémová integrace, Praha, Management Press, 1999.

3. O'Brien, J., Marakas, G.: Management Information Systems, McGraw-Hill, 2010, ISBN 0073376813.

4. Laudon, K., Traver, C.G.: Management Information Systems: Managing the Digital Firm, Prentice Hall, 2011, ISBN 0132142856.

Course language:

Slovak or English

Notes:

Course assessment

Total number of assessed students: 30

А	В	С	D	Е	FX
26.67	30.0	23.33	13.33	3.33	3.33

Provides: prof. RNDr. Gabriel Semanišin, PhD., Mgr. Richard Staňa

Date of last modification: 25.07.2022

University: P. J. Šafá	rik University in Košice					
Faculty: Faculty of S	Faculty: Faculty of Science					
Course ID: ÚMV/ MTIa/21	Course name: Mathematics I for informaticians					
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: 1.					
Course level: I.						
Prerequisities:						
Conditions for cours Two tests, completion Assessment is given The ability to solve combination with ma and relationships bett A total of 100 points test). In addition, it is active approach to the	be completion: In of individual and group homework (including project) during the semester. In the basis of semestral evaluation and examination test. In the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context / with context) also in the selected types of problems (without context) also in the selected types of pr					

Learning outcomes:

To obtain basic mathematical knowledge about the divisibility of integers, congruences, number systems, groups, 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, analytical expressions of a line/plane/circle/sphere - determination of their mutual position and angles (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).

Groups, fields - binary operation, group definition, Cayley's table, Latin squares, group isomorphism, subgroup, cyclic (sub) group, group order, element order, Cayley's theorem, Lagrange's theorem, field definition (1 week).

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: 216

А	В	С	D	Е	FX
1.39	8.8	9.26	20.37	47.69	12.5

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

Date of last modification: 30.04.2022

Boelkins M., Austin D., Schlicker S. (2018). Active Calculus. 978-1085940856.

Hallet D. H. et al. (2012). Calculus: Single & Multivariable Variable. Wiley.

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

Hallet D. H. et al. (2017). Calculus: Single Variable. Wiley.

Hartman G. et al. (2018). 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: 137							
A B C D E FX							
3.65	10.22	9.49	24.82	45.99	5.84		
Provides: RNDr. Andrej Gajdoš, PhD., RNDr. Stanislav Basarik							
Date of last modification: 30.04.2022							
Approved:							

University: P. J. Šafá	rik University in Košice						
Faculty: Faculty of Science							
Course ID: ÚINF/ MPJ1/15	Course name: Modern programming languages						
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: 8.						
Course level: I., II.							
Prerequisities: ÚINF	/PAZ1b/15						
Conditions for cours Demonstration of add evaluation, the abilit project. Written works during Written and oral examples	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: During the completi sophisticated program	on of the course, the student will master the use of standard and more nming models and techniques within .NET.						
 Brief outline of the c 1) Common type sy: Runtime (CLR)NH 2) Imperative and p Module. 3) Generic programm 4) Functional program 5) LINQ and queryin 6) Event programmin 7) Communication be 8) Graphic primitives 9) Database applicati 10) Vector programm 11) MS Office program 12) .NET Core. Tuple 	ourse: stem, boxing, Common Intermediate Language (CIL), Common Language ET Framework. rocedural programming. OOP, libraries, classes, assembly, reflection and hing - parametric polymorphism. nming - lambda expressions. g data structures. lig - delegates. etween windows. Design of new controls. and Chart. ons, ADO.NET, Entity Framework. hing - operator overloading, indexer. hing - operator overloading, indexer. hing using C#. e vs record.						
Recommended litera 1. J. Glynn, Cs. Törö ISBN-10: [*] 186100766 2. A. Troelsen , Ph. J Programming, 2021,	ture: k et al, Professional Windows GUI Programming Using C#, 2002, Wrox, 3 apikse, Pro C# 9 with .NET 5 : Foundational Principles and Practices in Apress, ISBN10 1484269381						

3. J. Albahari, C# 9.0 in a Nutshell : The Definitive Reference, 2021, O'Reilly Media, ISBN10 1098100964

4. C. Solis, C. Schrotenboer, Illustrated C# 7 : The C# Language Presented Clearly, Concisely, and Visually, 2018, Apress, ISBN10 1484232879

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Course langua Slovak or Engl	ge: ish.					
Notes: If necessary, tea	aching, mid-term	and final evaluation	tion will be by d	istance form.		
Course assessn Total number o	nent f assessed studer	nts: 153				
А	В	C	D	Е	FX	
15.69	18.95	25.49	20.92	17.65	1.31	
Provides: doc.	RNDr. Csaba Tö	rök, CSc.		·	-	
Date of last modification: 23.11.2021						
Approved:						

University: P. J. Šafárik	University in Košice						
Faculty: Faculty of Science							
Course ID: ÚFV/ Co NUM/10	ourse name: Numerical Methods						
Course type, scope and Course type: Lecture / J Recommended course- Per week: 2 / 1 Per stue Course method: presen	the method: Practice load (hours): dy period: 28 / 14 t						
Number of ECTS credit	ts: 4						
Recommended semester	c/trimester of the course: 3., 5.						
Course level: I.							
Prerequisities:							
Conditions for course co To successfully complet understanding and abilit algebra, which are nece evaluation is participation obtaining credits is pass electronically and with the into account the following projects (2 credits). The the the total score, using the 69%), E (50-59%), F (0-4	ompletion: the the course, the student must demonstrate a sufficient degree of ty to apply the basic numerical methods of mathematical analysis and essary for subsequent courses in computational physics. The basis of on and activity in exercises and work on assignments. The condition for ing 2 written tests at seminars and submitting 4 assignments (projects) he attached computer program. The credit evaluation of the course takes ng student workload: direct teaching (2 credits) and individual work on minimum threshold for completing the course is to obtain at least 50% of e following rating scale: A (90-100%), B (80-89%), C (70-79%), D (60- 49%).						
Learning outcomes: To acquaint students with for the next course of cor functions, solve systems determine eigenvalues ar	the basic numerical methods of mathematical analysis and algebra needed nputational physics. The student will learn to approximate and interpolate of linear and nonlinear equations, numerically derive and integrate or nd eigenvectors of matrices.						
Brief outline of the court 1. Computational solution 2. Approximation of function 3. Interpolation of function 4. Approximation by trig 5. Solution of nonlinear of 6. Numerical methods for 7. Solution of systems of 8. Solution of systems of 9. Numerical integration 10. Numerical differentian 11. Eigenvalues and eigen 12. The complete problem Becommended literature	rse: n of problems and errors of numerical solution. ctions. ons. gonometric polynomials. Fast Fourier analysis. equations, convergence conditions and error estimation of the methods. r solving nonlinear equations. f linear equations - direct methods. f linear equations - iterative methods. (quadrature) of functions. envectors of a matrix - partial problem. m of eigenvalues.						

Basic literature:

POZRIKIDIS, C.: Numerical Computation in Science and Engineering, Oxford University Press, 2008.

Other literature:

HAMMING, R.W.: Numerical Methods for Scientists and Engineers, Dover, 1973.

GARCIA, A.L.: Numerical Methods for Physics, Prentice-Hall, 1994.

Course language:							
Notes:							
Course assessment Total number of assessed students: 149							
А	В	С	D	Е	FX		
14.77	16.78	23.49	22.82	17.45	4.7		
Provides: prof.	RNDr. Milan Žu	kovič, PhD.		·			
Date of last modification: 14.09.2021							
Approved:	Approved:						

University: P. J. Šafá	arik University in Košice
Faculty: Faculty of S	Science
Course ID: ÚINF/ OSY1/21	Course name: Operating systems
Course type, scope a Course type: Lectu Recommended cou Per week: 2 / 1 Per Course method: pr	and the method: re / Practice srse-load (hours): study period: 28 / 14 resent
Number of ECTS cr	redits: 4
Recommended seme	ester/trimester of the course: 3.
Course level: I.	
Prerequisities:	
Conditions for cour Oral exam	se completion:
Learning outcomes: Student obtains base their structure and co of the life cycle of pr knowledge of physic as well as phenomen student to understan intervene with running	knowledge about the properties and internal processes of operating systems, incept. By completing the course, the student will gain a comprehensive picture cocesses, their planning and communication between them. He will also gets a cal, logical and virtual memory management and understands synchronization na such as deadlocks or starvation. The acquired knowledge will enable the d the behavior of the operating system, which leads to gaining the ability to ng operating system, eventually optimize it.
Brief outline of the of 1. History, developm 2. Kernel of the oper 3. Process - definition 4. Process - planning 5. Process - inter-pro- 6. Thread - definition 7. Synchronization of 8. Deadlock and star 9. Memory - definiti 10. Memory - alloca 11. Memory - MMU 12. Memory - virtual 13. File system - definite 14. File system - file	course: ent, user interface and structure of operating systems. ating system and system calls, implementation. on, structure, life cycle, implementation. g algorithms, multiprocessing. ocess communication. n, structure, life cycle, implementation. of processes and system resources. vation - prevention, detection, recovery. on, types of memories, usage, volatility, DMA. tion strategies, paging, fragmentation. , TLB, MPU, segmentation. I memory management strategies. inition, structure, implementation. , directory, attributes, access control, ACL.
Recommended liter 1. SILBERSCHATZ 10th Revised edition 2. TANENBAUM, A Pearson Education L	ature: , Abraham, Peter B. GALVIN a Greg GAGNE. Operating System Concepts. . New York, United States: John Wiley, 2021. ISBN 9781119800361. Andrew, Herbert BOS. Modern Operating Systems. 4th edition. London, UK: Limited, 2014. ISBN 9781292061429.

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

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

Course languag Slovak or Engl	ge: ish				
Notes:					
Course assessn Total number o	nent f assessed studer	nts: 171			
А	В	С	D	Е	FX
22.22	22.22	18.71	24.56	10.53	1.75
Provides: RND	r. PhDr. Peter Pi	sarčík, RNDr. JU	Dr. Pavol Sokol,	PhD.	
Date of last mo	dification: 08.10	0.2021			
Approved:					

University: P. J. Šafárik University in Košice						
Faculty: Faculty of Science						
Course ID: ÚINF/ PDS2/21Course name: Parallel and distributed systems						
Course type, scope a Course type: Lectur Recommended cou Per week: 2 / 2 Per Course method: pre	and the method: re / Practice rse-load (hours): study period: 28 / 28 esent					
Number of ECTS credits: 5						
Recommended seme	Recommended semester/trimester of the course: 6					

Course level: I.

Prerequisities:

Conditions for course completion:

Home assignments, class project from tutorials, midterm written exam. Final written and oral exam.

Learning outcomes:

Understand the principles, basic problems and algorithms of parallel programming. Be able to implement synchronization procedures and manage and use interprocess communication. Master the basics of GPU programming. Understand the differences between parallel and distributed computational models. Master basic distributed algorithms and know how to implement them. Understand the problems of creating a distributed system environment and know how to solve them. Be able to use distributed environments in practical applications.

Brief outline of the course:

Parallel architectures, parallel computational model, access to shared memory. Basic algorithms, scaling, optimality. Effective methods of parallel search and sorting. Working in a GPU environment. Distributed computational model, communication protocols, characteristics of distributed systems. Intercomputer communication, distributed synchronization algorithms, transactions, termination and deadlock detection. Consistency issues with distributed memory sharing. Distributed application environment. Reliable calculations in an environment with errors.

Recommended literature:

1. J. JáJá: An Introduction to Parallel Algorithms, Addison-Wesley, 1992, ISBN 0-201-54856-9

2. P. Sanders, K. Mehlhorn, M. Dietzfelbinger, R. Dementiev: Sequential and Parallel Algorithms and Data Structures, Springer, 2019

- 3. Sukumar Ghosh: Distributed Systems and Algorithms (Second Edition), CRC Press 2014
- 4. M. Raynal: Distributed Algorithms for Message-Passing Systems, Springer, 2013
- 5. Gerard Tel: Introduction to Distributed Algorithms, Cambridge University Press, 2001

Course language:

Slovak or English

Notes:

Content prerequisities: basic of concurrent programming, basic of operating system principles

Course assessment Total number of assessed students: 36							
A B C D E FX							
22.22	5.56	13.89	11.11	27.78	19.44		
Provides: doc. RNDr. Jozef Jirásek, PhD., RNDr. Rastislav Krivoš-Belluš, PhD., Mgr. Marián Dvorský, RNDr. Ladislav Mikeš, PhD.							
Date of last modification: 23.11.2021							
Approved:							

University: P. J. Šafá	University: P. J. Šafárik University in Košice						
Faculty: Faculty of Science							
Course ID: ÚINF/ PRP2/15	Course name: Principles of computers						
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 14 esent						
Number of ECTS cr	edits: 4						
Recommended seme	ster/trimester of the course: 2.						
Course level: I.							
Prerequisities:							
Conditions for cours Graded activities: ass	e completion: signments, mid semester exam, final exam						
Learning outcomes: - Know brief history Neumann type. - Understand relation able to perform basic - Learn basics about I principles of how ba memory. - Know principles of memory access. - Get idea of device of	of computer, classification and construction principles of computers of von between real numbers, integers and their binary representation as well as be arithmetic and logic operations over binary represented numbers. ogic gates, combination and sequence circuits and their structure. Understand asic circuits realize arithmetic-logic unit and other parts of computers e.g. communication of processor and other devices via interruptions and direct trivers, device controllers and their functionality.						
Brief outline of the c 1. Computers of von 2. Encoding of intege 3. Logic functions an 4. Combination circu 5. Arithmetic logic u 6. Sequential circuits 7. Machine cycle. 8. Types of instruction 9. Instruction cycle a 10. Memory and mer 11. Communication b interruption in compu and functionality. 12. Portability of pr Graphical adapters, m	ourse: Neumannovho type, brief history of computer science. ers, real numbers and arithmetic operations. Encoding of symbols. d their realization and optimisation. its. Realization of basic functional and control elements on computer circuits. nit ant its realization. , memory cell, organization of memory matrix, types of memories. n and instructions sets. nd processing of instructions. nory subsistem. between processor and peripheral devices. Input output devices, mechanism of iter, direct memory access. Functionality of device drivers. Device controllers rograms. External and peripheral memories their principles and their use. nonitors, printers, digital scanners.						
Number of ECTS cr Recommended seme Course level: I. Prerequisities: Conditions for course Graded activities: ass Uearning outcomes: - Know brief history Neumann type. - Understand relation able to perform basic - Learn basics about I principles of how ba memory. - Know principles of memory access. - Get idea of device of Brief outline of the c 1. Computers of von 2. Encoding of intege 3. Logic functions an 4. Combination circu 5. Arithmetic logic u 6. Sequential circuits 7. Machine cycle. 8. Types of instruction 9. Instruction cycle a 10. Memory and mer 11. Communication b interruption in compu- and functionality. 12. Portability of pr Graphical adapters, m	edits: 4 ster/trimester of the course: 2. ster/trimester of the course: 2. e completion: ignments, mid semester exam, final exam of computer, classification and construction principles of computers of von between real numbers, integers and their binary representation as well as be arithmetic and logic operations over binary represented numbers. ogic gates, combination and sequence circuits and their structure. Understand usic circuits realize arithmetic-logic unit and other parts of computers e.g. ' communication of processor and other devices via interruptions and direct lrivers, device controllers and their functionality. ourse: Neumannovho type, brief history of computer science. ers, real numbers and arithmetic operations. Encoding of symbols. d their realization and optimisation. its. Realization of basic functional and control elements on computer circuits. nit ant its realization. , memory cell, organization of memory matrix, types of memories. n and instructions sets. nd processing of instructions. nory subsistem. wetween processor and peripheral devices. Input output devices, mechanism of iter, direct memory access. Functionality of device drivers. Device controllers ograms. External and peripheral memories their principles and their use. nonitors, 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 stude	ents: 262
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А	В	С	D	Е	FX
26.34	15.27	16.79	12.21	24.43	4.96

Provides: RNDr. Juraj Šebej, PhD.

Date of last modification: 23.11.2021

University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of Science				
Course ID: 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	and the method: ce rse-load (hours): ady period: 14 esent			
Number of ECTS cr	redits: 1			
Recommended seme	ester/trimester of the course: 6.			
Course level: I.				
Prerequisities:				
Conditions for cour Creating a website at bachelor's thesis assi motivation to select a into the AIS by the t	se completion: 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 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.			
Brief outline of the o 1. Principles in creat 2. The presentations 3. The presentations 4. The presentations 5. Bachelor thesis and 6. Assignment of bac 7. Basic types of bac 8. Structure of differ 9. Requirements for 10. External compan 11. Presentation of so 12. Presentation of so 13. Presentation of so	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. d its objectives. chelor thesis. helor theses. ent types of bachelor theses. final bachelor theses. glial theses. elected topics of final theses. elected topics of final theses. elected topics of final theses.			
Recommended liter 1. STN 01 6910. Rul 2. STN ISO 2145. D 1997. 3. STN ISO 690. Inferences to informa 4. KATUŠČÁK, Dar	ature: es of writing and editing documents. 2011. ocumentation. Numbering of sections and subsections of written documents. ormation and documentation. Instructions for creating bibliographic ation sources and their citation. 2012 hiel. 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: 334	
abs	n
94.61	5.39
Provides: RNDr. Ľubomír Antoni, PhD.	
Date of last modification: 08.01.2022	
Approved:	

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

Course ID: ÚINF/	Course name: Proces modelling
PMO1/15	

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., 8.

Course level: I., N

Prerequisities: ÚINF/PAZ1b/15 and ÚINF/DBS1a/15 and ÚINF/SWI1a/15

Conditions for course completion:

The interim evaluation is based on the evaluation of partial tasks within the solution of the semester project.

The final assessment is given on the basis of the interim assessment and the result of the exam. On the exam, it is required to prove the ability to orient oneself in the presented issue, to master the theoretical foundations of process modeling, basic skills for the creation and interpretation of process models.

The evaluation is awarded if the student gets at least 50% of the possible points from each part of the exam. Detailed requirements are given in the AIS.

Learning outcomes:

By completing the subject, the student:

- acquires knowledge about the theoretical starting points and basics of process modeling,
- can master the basic principles of creating process models
- get familiar with standard languages for process modeling

- will gain practical experience in creating models using selected modeling tools.

Brief outline of the course:

- 1. Introduction to process modeling.
- 2. Development of approaches to the development of large software systems.
- 3. Theoretical foundations of process modeling.
- 4. Petri nets.
- 5. Process orchestration.
- 6. Choreography of processes.
- 7. Selected properties of processes and process models.
- 8. Architectures of process models.
- 9. Methodologies and standards.

Recommended literature:

1. Ehrig, H.; Juhas, G.; Padberg, J.; Rozenberg, G. (Eds.), Advances in Petri Nets, Lecture Notes in Computer Science, Vol. 2128 (2001)

2. Eshuis, R. ; Wieringa R.: Comparing Petri Net and Activity Diagram Variants for Workflow Modelling – A Quest for Reactive Petri Nets, [dostupné online http://is.tm.tue.nl/staff/heshuis/pnt.pdf]

3. Madison D., Process Mapping, Process Improvement and Process Management, Paton Press 2005

4. Weske, M. Business Process Management, Springer 2007

5. White S.A., Miers D., Fischer L., BPMN Modeling and Reference Guide, Future Strategies Inc., Lighthouse Pt 2008

6. White:, S.A. Process Modeling Notations and Workflow Patterns, [available online http://www.omg.org/bp-corner/bp-files/Process_Modeling_Notations.pdf]

Course language:

Slovak or English

Notes:

Content prerequisities: programming, bases of software engineering and database management systems, bases of project management

Course assessment

Total number of assessed students: 49

А	В	С	D	Е	FX
14.29	26.53	28.57	18.37	6.12	6.12

Provides: prof. RNDr. Gabriel Semanišin, PhD.

Date of last modification: 25.07.2022

University: P. J. Šafa	árik University in Košice				
Faculty: Faculty of S	Science				
Course ID: ÚINF/ OP/14	Course name: Professional experience				
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: Per study period: 2t Course method: present					
Number of ECTS cr	redits: 2				
Recommended seme	ester/trimester of the cours	e: 7.			
Course level: I.					
Prerequisities:					
Conditions for cour Prior to the realization the subject from unit internship, a positive where the internship she describes the act	se completion: on of the internship, the sche versity. After completing the evaluation of the internship was performed and student' ivities performed together w	dule need to be approved by the administrator of internship, the student submits attendance at the written by responsible person from the institution, s own final report from the internship, where he/ ith acquired knowledge and experience.			
Learning outcomes: Within the profession organizational struct practice on some pro-	onal practice, the student get ture, processes and basic so processes in the host institution	s acquainted with the institution, its main tasks, oftware used. Student gains experience through .			
Brief outline of the Student completes 1 implementation or te institution will take The internship norm to 2 days per week d	course: 0 days of professional practic sting of software or related for place in accordance with the ally takes place over a perior buring the semester or examin	the in institutions that are focused on development, becused companies. The selection of an appropriate focus of the student within the bachelor's study. d of 2 weeks during the examination period, or 1 mation period.			
Recommended liter The student works w	ature: vith resources and literature t	hat are specified by the host institution.			
Course language: Slovak or English					
Notes:					
Course assessment Total number of asse	essed students: 17				
	abs n				
	100.0 0.0				
Provides:					
Date of last modific	ation: 12.11.2021				

University: P. J. Šaf	árik University in Košice
Faculty: Faculty of	Science
Course ID: ÚINF/ JAC1/15	Course name: Programming language C
Course type, scope 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., 7.
Course level: I., II.	
Prerequisities:	
Conditions for cour Practics attendance a Final project.	se completion: and activity. Home assigment
Learning outcomes The student will gain is the primary system components, as well from the simple lang in the management of	: n the ability to create source code files in the C programming language, which n programming language used in the creation of operating systems and system as firmware for embedded devices. The aim of the exercise is to guide students guage constructs to a full understanding of working with pointers and their use of static and dynamic memory.
 Brief outline of the Short overview of execution. Variables and data Cycles, condition Functions. Pointers - concept Fields - principle, Dynamic memory N-dimensional fields. Text strings. Input and output Dynamic fields a Basic operations Pointer to a funct Compiling a pro- 	course: 'language history, explanation of terms, code compilation, linking and program a types, unary, binary and ternary operations, operator precedence. s. Structures, unions and enumerators. t, implementation, pointer arithmetic. implementation. / allocation. elds and pointers. c, command line arguments, process return codes. and structures. s with regular files. ction. gram from source code using the "make" utility
Recommended liter 1. KERNIGHAN, B 2006. ISBN:802510	ature: Frian W., Dennis M. RITCHIE. Programovací jazyk C. Brno: Computer Press, 897X.

2. PRATA, Stephen. C Primer Plus. 6th Edition. Addison-Wesley Professional, 2014. ISBN 9780321928429.

3. SEACORD, Robert C. Effective C: An Introduction to Professional C Programming. San
Francisco, United States: No Starch Press, 2020. ISBN 9781718501041.

Course language: Slovak or English

Notes:

Course assessment

Total number of assessed students: 236

А	В	С	D	Е	FX	
34.75	18.64	16.1	16.1	10.17	4.24	
Provides: RNDr. PhDr. Peter Pisarčík, RNDr. Patrik Pekarčík						
Date of last modification: 08.10.2021						
Approved:						

University: P. J. Šafárik University in Košice				
Faculty: Faculty of Science				
Course ID: 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 cr	edits: 8			
Recommended seme	ster/trimester of the course: 1.			
Course level: I.				
Prerequisities:				
Conditions for cours Graded activities dur Final examination: pr Rules to pass the subj final project) and tes defined limit of total	e completion: ing semester: assignments, small exams, midterm, final project. cactical 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.			
Brief outline of the c 1. Introduction to Jav objects using turtle g 2. For-loops, local van conditions.	ourse: 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,			
 While-loop, return Primitive and reference variables. 	rence types, chars, String objects (including basic algorithms), mouse events,			
 Array of primitive Advanced array alg 	values and array of references, simple array algorithms. gorithms, two-dimensional array.			
8. Reading from text	files.			
overloading.	olymornhism			
 11. Java Collections autoboxing, interface 12. Access modifiers static methods and va 	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, priables.			
13. Creating and thro	wing exceptions, checked and runtime exceptions, JavaDoc, Maven.			
Recommended litera	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: 788

А	В	С	D	Е	FX
16.37	7.87	11.17	15.48	14.47	34.64

Provides: RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD., Mgr. Zoltán Szoplák, Mgr. Viktor Pristaš, doc. RNDr. Ondrej Krídlo, PhD., Mgr. Richard Staňa, Mgr. Viktor Olejár

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 o	Total number of assessed students: 1267							
А	В	С	D	Е	FX			
13.89	7.73	10.34	19.26	21.15	27.62			
Provides: RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD., Mgr. Viktor Pristaš, doc. RNDr. Ondrej Krídlo, PhD.								
Date of last mo	dification: 04.01	.2022						

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., 5.

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:// pazlc.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: https://angular.io/

Course language:

Slovak

Notes:

Content prerequisites: basic programming in Java

Course assessment

Total number of assessed students: 135

А	В	С	D	Е	FX
22.22	10.37	14.07	27.41	22.22	3.7

Provides: RNDr. Peter Gurský, PhD.

Date of last modification: 04.01.2022

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ PRO1a/15	Course name: Project I.
Course type, scope a Course type: Practic Recommended cour Per week: 4 Per stu Course method: pre	nd the method: ce cse-load (hours): dy period: 56 sent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course: 4., 6.
Course level: I., N	
Prerequisities:	
Conditions for cours Activity in exercises solving a specific pro	e completion: , elaboration of home assignments. Presentation of the results achieved in blem. Uploading a software work.
Learning outcomes: Acquire the way of problems of compute	working on a software work, communication in a software team, solving r systems administration in all phases of their life cycle.
Brief outline of the c 1. Introduction to the 2. Presentation of pro 3. Data storage, work 4. Command Line co 5. Creating versions 6. Presentation of the 7. Presentation of the 8. Merging of individ 9. Presentation of new 10. Presentation of new 11. Presentation of th 12. Presentation of th	ourse: Software Project, team building. jects and assignment of Projects to individual teams. ing with storage mmands to work with the repository current state of the projects current state of the projects ual branches v technologies from the project ew technologies from the project e final project.
Recommended litera 1. https://www.udemy 2. https://www.jenkin 3. Study literature tie	ture: y.com/course/ Git & GitHub - The Complete Git & GitHub s.io/doc/ d to the selected project (according to the client's recommendation)
Course language: Slovak or English	
Notes:	

content prerequisities: programming skills

Course assessment Total number of assessed students: 121								
А	A B C D E FX							
71.07	7.44	7.44	9.92	3.31	0.83			
Provides: RNDr. Róbert Novotný, PhD., RNDr. Peter Gurský, PhD.								
Date of last modification: 23.11.2021								
Approved:								

University: P. J. Šaf	ărik University in Košice
Faculty: Faculty of	Science
Course ID: ÚINF/ PRO1b/15	Course name: Project II.
Course type, scope Course type: Pract Recommended cou Per week: 4 Per st Course method: pr	and the method: ice irse-load (hours): udy period: 56 resent
Number of ECTS c	redits: 4
Recommended sem	ester/trimester of the course: 5., 7.
Course level: I., N	
Prerequisities:	
Conditions for cour Presentation of the Preparation of mater	results achieved in solving a specific problem. Uploading a software work. rials for the promotion of the final work.
Learning outcomes Acquire the way of software team, solvi	: working on the software work with agile methodology, communication in the ng problems of computer systems administration in all phases of their life cycle.
 Brief outline of the Work in a 4-5 memb of a mentor from soft in command lines. S 1. Introduction to th 2. Presentation of pr 3. CI / CD Pipeline 4. JUnit Tests 5. Selenium Tests 6. Presentation of th 7. Presentation of th 8. Stress tests 9. Presentation of no 10. Presentation of no 11. Presentation of th 12. Presentation of th 	course: ber team on the development, testing of a software product under the guidance ftware companies. Improving with continuous integration and working with git foftware development using Agile methodology. e Software Project, team building. rojects and assignment of Projects to individual teams. e current state of the projects e current state of the projects e w technologies from the project hew technologies from the project he final project.
Recommended liter 1. https://www.uden 2. https://www.jenki 3. Study literature ti 4. "What is Agile So	rature: ny.com/course/ Git & GitHub - The Complete Git & GitHub ins.io/doc/ ed to the selected project (according to the client's recommendation) oftware Development?". Agile Alliance. 8 June 2013. Retrieved 4 April 2015.
Course language: Slovak or english	

Notes: Content prerequ advanced progr	uisities: amming skills							
Course assessm Total number of	nent f assessed studen	ts: 81						
А	В	С	D	Е	FX			
55.56	16.05	9.88	8.64	3.7	6.17			
Provides: RND	Provides: RNDr. Róbert Novotný, PhD., RNDr. Peter Gurský, PhD.							
Date of last modification: 23.11.2021								
Approved:								

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ PRM1/15	Course name: Project management
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 14 esent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course: 3.
Course level: I., N	
Prerequisities:	
Conditions for cours The ongoing evaluati final evaluation is bas be included in the over	e completion: on consists of the evaluation of the sub-tasks related to the project design. The sed on a written and oral exam. The result of the ongoing evaluation will also erall evaluation.
Learning outcomes: Gain basic knowledg evaluation. Acquire b	e and skills related to project preparation, project mplementation and project basic knowledge of project team management and organization.
 Brief outline of the c 1. Introduction to pro 2. Project planning. F 3. Project specification 4. Estimating project 5. Work organization 6. Monitoring and pro 7. Project closure. 8. Project manageme 9. Estimating project 10. Project document 11. Specific approach 12. Prince2 	ourse: ject management. Preparation of project documentation. on. Time and Costs. oject control. nt models. times and costs. ation. nes for projects in the field computer science.
Recommended litera 1. BERKUN, S. The 2. Erik Larson and C. 3. PRINCE2. Avaliat	Art Of Project Management. O Reilly, 2005. lifford Gray : Project Management: ble on internet: <http: www.prince2.com="">.</http:>
Course language: Slovak or english	

Notes:

Course assessment Total number of assessed students: 104								
А	A B C D E FX							
28.85	25.96	23.08	9.62	5.77	6.73			
Provides: prof. RNDr. Gabriel Semanišin, PhD., Mgr. Viktor Pristaš								
Date of last modification: 23.09.2021								
Approved:	Approved:							

University: P. J	. Šafárik Unive	rsity in Košice					
Faculty: Facult	y of Science						
Course ID: ÚI BAPS/15	NF/ Course name: Security and administration of computer systems						
Course type, so Course type: Recommended Per week: Per Course metho	cope and the m d course-load r study period d: present	ethod: (hours): :					
Number of EC	TS credits: 4						
Recommended	semester/trim	ester of the cours	e:				
Course level: I.							
Prerequisities: ÚINF/FAN/15)	ÚINF/KRS/15 and ÚINF/SKI	and (ÚINF/ADL1 31/15	/15 or ÚINF/AD)W1/15) and (ÚI)	NF/ARP1/15 or		
Conditions for Appropriate kn and administra knowledge and	course comple owledge and c tion of compu procedures and	etion: ompetencies from ter systems, demo d apply them to co	the profile course onstrating the altern problems	ses of the special pility to synthesi s.	isation Security se the acquired		
Learning outco Verification of a	omes: acquired studer	nt competencies in	accordance with	the graduate pro	ofile.		
Brief outline of 1. Programming 2. Principles of 3. Database sys 4. Fundamental 5. Cryptograph 6. Network and	The course: g techniques, d operating. tems. computer arch ic systems and communicatio	ata structures, algo itectures. their applications. n security.	rithms and their	complexity.			
Recommended Information sou	literature:	nded within indivi	dual profile cour	ses.			
Course langua Slovak languag	ge: e						
Notes:							
Course assessn Total number o	rent f assessed stude	ents: 2					
А	В	C	D	Е	FX		
0.0	50.0	0.0	0.0	50.0	0.0		
Provides:	<u> </u>		1	<u>ı </u>	<u>, </u>		
Date of last mo	dification: 17.	11.2021					
Approved:							

University: P. J.	Šafárik Univers	ity in Košice						
Faculty: Faculty of Science								
Course ID: ÚIN SPS1/15	F/ Course na	Course name: Seminar in network programming						
Course type, sco Course type: P Recommended Per week: 3 Pe Course method	ope and the met ractice course-load (h r study period: l: present	thod: ours): 42						
Number of ECT	S credits: 3							
Recommended s	semester/trimes	ster of the course	e: 7.					
Course level: I.,	II.							
Prerequisities:								
Conditions for c	ourse completi	on:						
Learning outcom To render current	nes: it technologies o	f programing in r	network distrib	uted environment.				
Brief outline of Basics of progra Procedure Calls. ASP, JSP, Comp Model, XML, X Advanced level	the course: amming the clie Server-side pro ponent Object M SL, dynamic ex of programming	ent-server applica gramming, CGI, 1 Iodel, Corba, dat tensions of HTM g is expected.	tions, iterative PHP, basics of abase connecti L.	e and concurrent s Perl and Python. S ion's interfaces. D	servers, Remote Script languages, ocument Object			
Recommended I Internet sources	iterature: and specificatio	ns.						
Course languag	e:							
Notes:								
Course assessme Total number of	Course assessment Total number of assessed students: 96							
A	В	С	D	E	FX			
65.63	65.63 20.83 11.46 1.04 1.04 0.0							
Provides: RNDr	. Rastislav Krive	oš-Belluš, PhD.		•	-			
Date of last mod	lification: 08.01	.2022						
Approved:								

University: P. J	. Šafárik Unive	rsity in Košice			
Faculty: Facult	Faculty: Faculty of Science				
Course ID: ÚI PRIS/15	IF/ Course name: Software and information system				
Course type, so Course type: Recommende Per week: Pe Course metho	Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present				
Number of EC	TS credits: 4				
Recommended	semester/trim	ester of the cours	se:		
Course level: I.					
Prerequisities:	ÚINF/ASU1/1:	5 and ÚINF/TVP1	/21 and ÚINF/P	MO1/15 and ÚIN	NF/SWI1b/15
Conditions for Appropriate kn and informatio procedures and	Conditions for course completion: Appropriate knowledge and competencies from the profile courses of specialisation Programming and information systems, demonstrating the ability to synthesise the acquired knowledge and procedures and apply them to problems from the area of informatics				
Learning outco Verification of	omes: acquired studen	t competencies in	accordance with	the graduate pro	file.
 Brief outline of the course: Programming techniques, data structures, algorithms and their complexity. Principles of operating systems. Database systems. Principles and methods of software engineering. Principles and methods of business process modelling. 					
Recommended literature:					
Information sou	urces recommer	nded within indivi	dual profile cour	ses.	
Course language: Slovak language					
Notes:	Notes:				
Course assessment Total number of assessed students: 35					
А	В	С	D	Е	FX
25.71	20.0	34.29	8.57	11.43	0.0
Provides:	Provides:				
Date of last mo	Date of last modification: 17.11.2021				
Approved:					
L					

University: P. J. Šafárik University in Košice					
Faculty: Faculty of Science					
Course ID: ÚINF/ SWI1a/15	Course name: Software engineering				
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 cr	edits: 2				
Recommended seme	ster/trimester of the course: 4.				
Course level: I.					
Prerequisities: ÚINF	/DBS1a/15				
Conditions for course completion: The evaluation will be given on the basis of the proper fulfilment of the partial tasks of solving the (group) project during the semester. The minimum prerequisite for passing the subject is obtaining 50% of the total possible number of points. The sub-probation conditions for evaluation are published in the AIS.					
 By completing the subject, the student: acquires basic knowledge of the principles and methods of software engineering, get familiar with the individual stages of the software development life cycle, familiarizes himself with the modeling of software systems and acquires basic knowledge from the use of relevant SW tools, will gain basic experience in working in a team and with project management and presentation. 					
Brief outline of the course: 1. Introduction to software engineering. 2. Software processes 3. Selected support tools for managing software processes. 4. Requirements engineering. 5. Agile methods. 6. Modeling of systems. 7. Implementation of software systems. 8. Architectures of software systems. 9. Testing. 10. Evolution of systems. 11. Case studies of software systems. 12. BERKUN, S. The Art Of Project Management. O Reilly, 2005. 2. BJORNER, D. Software engineering 1.2.3. Springer-Verlag Berlin 2006					
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 English					
Notes: Content prerequisities: Database systems, OOP					
Course assessment Total number of assessed students: 332					
А	В	С	D	Е	FX
19.28	23.8	19.58	17.17	18.67	1.51
Provides: prof. RNDr. Gabriel Semanišin, PhD., Mgr. Dávid Varga					
Date of last modification: 25.07.2022					
Approved:					

University: P. J. Šafárik University in Košice					
Faculty: Faculty of Science					
Course ID: ÚINF/ SWI1b/15	Course name: Software engineering				
Course type, scope a Course type: Practic Recommended cour Per week: 3 Per stu Course method: pre	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 cro	edits: 3				
Recommended seme	ster/trimester of the course: 5.				
Course level: I.					
Prerequisities: ÚINF	/SWI1a/15				
Conditions for cours Evaluation of the qua	e completion: lity of the processed project, its presentation and defense.				
Learning outcomes: To learn principles development and imp	and to developed fundamental skills concerning software modelling, plementation.				
 Brief outline of the c Software Evolution Safety Engineering Security Engineering Security Engineering Software Reuse Distributed Softwa Service - oriented S Systems of System Real - time Softwa Project planning Quality managem Configuration matical security 	ourse: n g ng, Resilience Engineering re Engineering Software Engineering is re Engineering ient nagement				
Recommended literature: 1. BERKUN, S. The Art Of Project Management. O Reilly, 2005. 2. BJORNER, D. Software engineering 1,2,3. Springer-Verlag Berlin, 2006. 3. PRINCE2. Dostupné na internete: http://www.prince2.com . 4. SOMMERVILLE, I. Software Engineering. Addison-Wesley, 2007. 5. UML. Dostupné na internete: http://www.prince2.com . 4. SOMMERVILLE, I. Software Engineering. Addison-Wesley, 2007. 5. UML. Dostupné na internete: http://www.prince2.com .					
Slovak or English					

content prerequisities: advanced programming

Course assessment Total number of assessed students: 276					
А	В	С	D	Е	FX
46.01	19.93	12.68	7.61	12.32	1.45
Provides: prof. RNDr. Gabriel Semanišin, PhD., Mgr. Dávid Varga					
Date of last modification: 23.11.2021					
Approved:					

	COURSE INFORMATION LETTER			
University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of S	Faculty: Faculty of Science			
Course ID: ÚINF/ SZPa/22	Course name: Special seminar to bachelor thesis			
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 1 Per study period: 14 Course method: present Number of ECTS credits: 1				
Recommended seme	ster/trimester of the course: 7.			
Course level: I.				
Prerequisities: ÚINF	/PBS/15			
Update of the bachel selected in the bachel scientific article of 5 supervisor. Learning outcomes: Basic knowledge abo aspects of the bachelo creating the database of the current state of preparation of a scien	by 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 sis. Basic knowledge about the thesis bachelor's thesis.			
 Brief outline of the c 1. Procedure for writ 2. Standards and forr 3. Rules of writing an 4. Documentation, N 5. Information and de 6. Instructions for cree 7. Selected typograph 8. Professional resou 9. Principles of corree 10. Tools for creating 11. Annotation of read 	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. et citation. g your own database of used literature. d literature, creation of searches.			

- 12. Presentation of selected topics of bachelor theses.
- 13. Presentation of selected topics of bachelor theses.

Recommended literature:

1. STN 01 6910. Rules of writing and editing documents. 2011.

2. STN ISO 2145. Documentation. Numbering of sections and subsections of written documents. 1997.

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:	132		
abs	n	neabs	
98.48	1.52	0.0	
Provides: RNDr. Ľubomír Antoni,	PhD.		
Date of last modification: 08.01.2022			
Approved:			

University: P. J. Šafárik University in Košice		
Faculty: Faculty of S	Science	
Course ID: ÚINF/ SZPb/22Course name: Special seminar to bachelor thesis		
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 1 Per study period: 14 Course method: present		
Number of ECTS credits: 1		
Recommended semester/trimester of the course: 8.		
Course level: I.		

Prerequisities: ÚINF/SZPa/22

Conditions for course completion:

Update of the bachelor thesis website. Presentation of the obtained results of the bachelor's thesis. Preparation of at least a 10-page scientific article for the topic chosen in the bachelor's thesis in the required structure and its approval by the thesis supervisor. Creating a promotional image (poster) about the results of the bachelor's thesis.

Learning outcomes:

Basic knowledge of the central register of final theses, licenses and copyrights, content and form of presentation of the overall results achieved in the bachelor's thesis. Basic knowledge about the preparation of a scientific article and presentation of the achieved results for popularization purposes.

Brief outline of the course:

- 1. Central register of final theses.
- 2. Licenses and Copyrights.
- 3. Directive on basic requirements for final theses at UPJŠ in Košice.
- 4. The most common mistakes in writing a final thesis.
- 5. Evaluation criteria and examples of assessments.
- 6. Preparation of a presentation for the defense of the final thesis.
- 7. Preparation of a scientific article.
- 8. Preparation of a presentation for the defense of the final thesis.
- 9. Preparation of a scientific article.
- 10. Procedure for submitting the final thesis.
- 11. Popularization of bachelor thesis results.
- 12. Presentations of the results of bachelor theses.
- 13. Presentations of bachelor thesis results.

Recommended literature:

1. STN 01 6910. Rules of writing and editing documents. 2011.

2. STN ISO 2145. Documentation. Numbering of sections and subsections of written documents. 1997.

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, 20135. 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: 131			
abs	n	neabs	
98.47 1.53 0.0			
Provides: RNDr. Ľubomír Antoni, PhD.			

Date of last modification: 08.01.2022

University: P. I. Šafárik University in Košice				
Examples of Colores				
Course ID: UINF/ Course name: Specialized seminar to bachelor thesis SSBa/20				
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: 7.				
Course level: I.				
Prerequisities:				
Conditions for course completion: Presentation of scientific papers and software solutions in the selected field of computer science. Active participation in discussions about possible solutions to selected problems.				
Learning outcomes: Student train the ability to study and present the principles and use of new software solutions to colleagues or to study and present the results of scientific results published in journals and conference papers.				
Brief outline of the course: Presentation of scientific papers from a selected field of informatics. Practical presentation of current software solutions (libraries, frameworks) that are not included in study programs. Discussions on possible solutions to selected problems in computer science. The schedule of presentations will be published after the first meeting on the subject's website or other agreed location				
Recommended literature:1. Scientific books and papers related to the selected field of computer science.2. Book and online resources describing principles and use of selected software solutions				
Course language: Slovak or English				
Notes:				
Course assessment Total number of assessed students: 30				
abs n				
100.0 0.0				
Provides: RNDr. JUDr. Pavol Sokol, PhD., RNDr. Juraj Šebej, PhD., RNDr. Peter Gurský, PhD., RNDr. Ľubomír Antoni, PhD.				
Date of last modification: 17.11.2021				

University: P. J. Šafá	University: P. J. Šafárik University in Košice				
Faculty: Faculty of Science					
Course ID: ÚINF/ SSBb/20	Course name: Specialized seminar to bachelor thesis				
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 cr	edits: 2				
Recommended seme	ster/trimester of the cours	e: 8.			
Course level: I.					
Prerequisities:					
Conditions for cours Presentation of scien Active participation i	e completion: tific papers and software so n discussions about possible	lutions in the selected field of computer science. e solutions to selected problems.			
Learning outcomes: Student train the ability to study and present the principles and use of new software solutions to colleagues or to study and present the results of scientific results published in journals and conference papers.					
 Brief outline of the course: Presentation of scientific papers from a selected field of informatics. Practical presentation of current software solutions (libraries, frameworks) that are not included in study programs. Discussions on possible solutions to selected problems in computer science. The schedule of presentations will be published after the first meeting on the subject's website or other agreed location 					
Recommended literature: 1. Scientific books and papers related to the selected field of computer science. 2. Book and online resources describing principles and use of selected software solutions					
Course language: Slovak or English					
Notes:					
Course assessment Total number of asse	ssed students: 31				
	abs n				
	96.77 3.23				
Provides: RNDr. JUDr. Pavol Sokol, PhD., RNDr. Juraj Šebej, PhD., RNDr. Peter Gurský, PhD., RNDr. Ľubomír Antoni, PhD.					
Date of last modifica	tion: 17.11.2021				

University: P. J. Šafár	University: P. J. Šafárik University in Košice				
Faculty: Faculty of Science					
Course ID: ÚFV/ MSU/07	Course name: Statistical Methods of Data Analysis				
Course type, scope a 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: 4				
Recommended seme	ster/trimester of the course: 5.				
Course level: I.					
Prerequisities:					
Conditions for cours 1. Active participatio 2. 2x test 3. Passing the oral ex Detailed conditions a within the repository The teacher justifies reasons, etc.) a maxim In the event of a long determine the student Credit evaluation of t and individual consult threshold for complete rating scale: A (91-10)	e completion: n in lectures and excersises am re updated annually on the electronic bulletin board of the course in AiS2 or for digital support materials (LMS UPJŠ, MS Teams UPJŠ, etc.) the justified non - participation of the student (incapacity for work, family num of two lectures during the semester without the need for replacement. ger-term justified absence (for example due to incapacity for work), it shall an alternative form of mastering the missed study matter. he course takes into account the following student workload: direct teaching itations (2 credits), self-study (1 credit), evaluation (1 credits). The minimum ing the course is to obtain at least 51% of the total score, using the following 00%), B (81-90%), C (71-80%), D (61- 70%), E (51-60%), F (0-50%).				
Learning outcomes: General introduction	to theory of probability, random processes and mathematical statistics.				
 Brief outline of the c 1. Random phenomen 2. Interpretations and 3. Distribution function 4. Discrete and continning 5. Distributions: bino 6. Distributions: uniformation 6. Distributions: uniformation 7. Distrbutions: chi-se 8. Characteristic function 9. Chebyshev inequal 10. Law of large numerical 11. Statistical and systematical 	ourse: ha, random quantities and variables. concept of probability, different definitions of probability. ons and probability density. uous random variables. Moments of distributions. Covariance and correlation. mial, Poisson, normal, negative binomial, geometric, multinomial. orm, exponential, multivariate, Gaussian, Cauchy distributions. Central limit quared, Student and Fisher. Quantiles. tion. lity. Chebyshev theorem. Bernoulli theorem. bers. The estimates of parameters of theoretical distributions from measured ikelihood method. The weighted mean. stematic measurement errors. Estimation of errors. Propagation of errors.				

12. Hypotheses testing. Null and alternative hypotheses. The least squares method. Linear and nonlinear regression. Quality of regression, significance level.

Recommended literature:

1) L. Lyons, Statistics for Nuclear and Particle Physics, CUP, 1989.

2) L. Lyons, A Practical Guide to Data Analysis for Physical Science Students, CUP, 1991.

3) J.R. Taylor, An Introduction to Error Analysis: The Study of Uncertainties in Physical

Measurements, University Science Books, 1997.

Course language:

Notes:

Course assessment

Total number of assessed students: 97

А	В	С	D	Е	FX
17.53	11.34	11.34	12.37	47.42	0.0

Provides: doc. RNDr. Adela Kravčáková, PhD.

Date of last modification: 16.09.2021

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚINF/ SXM1/15	Course name: Structure formats and representation of data
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 sent
Number of ECTS cro	edits: 2
Recommended seme	ster/trimester of the course: 5.
Course level: I.	
Prerequisities:	
Conditions for cours Evaluation of partial Evaluation of multipl Final written test.	e completion: exercises. e assignments corresponding to learning blocks.
Learning outcomes: Become acknowledg semistructured data.	ged with theoretical concepts and methodologies with structured and Acquire programming skills with implementations of these concepts.
 Brief outline of the c 1. Representation of s 2. XML parsers: DOI 3. SAX parser. 4 StAX parser. 4 StAX parser. 5. Java API of XML 7. Schemas for XML 8. Addressing in XM 9. Transformations of 10. Other formats for 11. API for data bind 	ourse: semi-structured data in XML, valid and well-formed XML document. M, parsers. documents: DTD, XML Schema. L: XPath. S XML documents: XSLT. semistructured data: JSON, YAML. ing in Java: Jackson (JSON), SnakeYAML (YAML), JAXB (XML).
Recommended litera 1. Eliotte "Rusty" Ha 2. Grigoris Antoniou, 2008. ISBN 978-0262 3. Michaek Kay. XSI 978-076456909.	ture: rold. XML Bible, Gold Edition. Wiley, 2001. ISBN 978-0764548192. Frank Van Harmelen. A Semantic Web Primer, Second Edition. MIT Press, 2012423. T 2.0 Programmer's Reference, 3rd Edition. Wrox, 2004. ISBN:
Course language: Slovak or English	
Notes:	

Course assessment Total number of assessed students: 86								
А	A B C D E FX							
32.56	23.26	22.09	11.63	9.3	1.16			
Provides: Mgr. Zoltán Szoplák								
Date of last modification: 23.11.2021								
Approved:								

Faculty: Faculty of Science

Course ID: ÚINF/	Course name: Testing and verification of programs
TVP1/21	

Course type, scope and the method:

Course type: Lecture / Practice

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

Course method: present

Number of ECTS credits: 4

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

Activity during course, work on tasks/assignments, final evaluation based on collected points

Learning outcomes:

Foundation of software testing principles at the basic level and the importance of its application in practice. The utilization of test automation to streamline the testing process across the software development lifecycle.

Brief outline of the course:

1. Fundamentals of software testing, testing throughout the software development lifecycle, test levels, test types, maintenance testing

- 2. Static testing techniques, test case design, test techniques, test implementation, test execution
- 3. Test management, test strategy, defect management, tool support for testing, code review

4. Test automation introduction, purpose of test automation, success factors, test automation strategy, preparing for test automation

- 5. Generic test automation architecture, test automation solution development, test automation framework
- 6. Transition from manual tests to automated tests, criteria for automation, test automation pyramid
- 7. Test automation of Graphical user interface (Web, Desktop, Mobile), various tools overview
- 8. Web services (REST) test automation, various tools overview

9. Testing and automation in Agile and DevOps, exploratory testing, behavior driven development, test driven development, acceptance test driven development, integration to CICD

10. Non-Functional testing introduction, performance and load testing, security testing, usability testing

Recommended literature:

 $1.\ ISTQB\ CTFL\ Sylabus,\ available\ online\ <https://www.istqb.org/certification-path-interval of the sylabus and the synaple of the syna$

root/foundation-level-2018.html>, https://castb.org/wp-content/uploads/2020/05/

ISTQB_CTFL_Syllabus_SK_2018_3.1-1.pdf>

2. ISTQB ATAE Sylabus, available online < https://www.istqb.org/certification-path-root/test-automation-engineer.html >

3. Myers, G.: The Art of Software Testing, (2011)

4. Lisa Crispin and Janet Gregory: Agile Testing: A Practical Guide for Testers and Agile Teams, 2008

5. Mark Fewster, Dorothy Graham: Software Test Automation: Effective use of test execution tools, 1999

6. Mark Fewster, Dorothy Graham: Experiences of Test Automation: Case Studies of Software Test Automation, 2012

7. Katarina Clokie: A Practical Guid to Testing in DevOps, available online https://leanpub.com/testingindevops>

Course language:

Slovak or English

Notes:

notes:					
Course assessm Total number of	ent f assessed studen	ts: 50			
А	В	С	D	Е	FX
18.0	22.0	20.0	14.0	22.0	4.0
Provides: Mgr.	Maroš Dzuriš				
Date of last mo	dification: 31.01	.2022			
Approved:					

University: P. J. Šafárik University in Košice							
Faculty: Faculty of Science							
Course ID: ÚIN ZPIa/22	NF/ Course name: Thesis in informatics						
Course type, scope and the method: Course type: Recommended course-load (hours): Per week: Per study period: Course method: present							
Number of ECT	S credits: 1						
Recommended s	semester/trimes	ster of the cours	e: 7.				
Course level: I.							
Prerequisities:							
Conditions for c To be awarded th to the supervisor bachelor thesis, according to the	Conditions for course completion: To be awarded the credits, students are required to participate regularly in consultations according to the supervisor's instructions, continuously read the recommended literature and work on own bachelor thesis, the written draft of which will be submitted by a student for final assessment according to the supervisor's instructions.						
Learning outcome Students are able time schedule and make initial rese	nes: e to manage prep d format in line arch of sources,	paration and writi with valid standa research itself a	ing of own bache ards. Under supe nd writing of the	elor thesis in term rvision of the sup thesis.	s of is structure, ervisor students		
Brief outline of a Bachelor thesis (bachelor thesis, a bibliography ref the supervisor and depends on select or agreement bet	the course: (its place and im main parts of bac erences. The ser nd a student, acc cted topic of the tween the superv	portance in univ chelor thesis, for ninar is schedule ording to the sup bachelor thesis, visor and a stude	ersity education) mat of bachelor t d in the form of pervisor's instruc condition of its nt.), time schedule o hesis, principles o individual consul tions. The conten preparation and i	of preparation of of quotation and tations between it of the seminar ndividual needs		
Recommended literature: The recommended literature is determined individually in accordance with the topic of the bachelor's thesis.							
Course language: Slovak, optionally English							
Notes:							
Course assessment Total number of assessed students: 0							
Α	В	С	D	E	FX		
0.0	0.0	0.0	0.0	0.0	0.0		
Provides:	Provides:						

Date of last modification: 20.11.2021

University: P. J. Š	afárik Univers	ity in Košice				
Faculty: Faculty of	of Science					
Course ID: ÚINF/ ZPIb/18 Course name: Thesis in informatics						
Course type, scop Course type: Recommended of Per week: Per s Course method:	e and the met course-load (h tudy period: present	hod: ours):				
Number of ECTS	credits: 2					
Recommended se	mester/trimes	ster of the cour	se: 8.			
Course level: I.						
Prerequisities: Ú	NF/ZPIa/22					
Conditions for co To be awarded the to the supervisor' bachelor thesis, the according to the s	urse completi e credits, stude s instructions, he written dra upervisor's ins	on: nts are required continuously re ft of which wil tructions.	to participate repead the recommendation of the submitted by the submitted	gularly in consulta ended literature an by a student for f	ations according nd work on own final assessment	
Learning outcom Students are able time schedule and make initial resea	es: to manage prep format in line rch of sources,	paration and write with valid stand research itself a	ting of own bach lards. Under supe and writing of th	elor thesis in term ervision of the sup e thesis.	ns of is structure, pervisor students	
Brief outline of the Bachelor thesis (in bachelor thesis, m bibliography refer the supervisor and depends on select or agreement betw	te course: ts place and im ain parts of bac rences. The ser a student, acc ed topic of the veen the superv	portance in universe in universe of the set	versity education rmat of bachelor ed in the form of pervisor's instru- , condition of its ent.	a), time schedule of thesis, principles of findividual consul- ctions. The content preparation and i	of preparation of of quotation and ltations between nt of the seminar individual needs	
Recommended lit The recommended bachelor's thesis.	d literature:	etermined indiv	idually in accord	lance with the top	vic of the	
Course language: Slovak, optionally	v English					
Notes:						
Course assessmen Total number of a	nt ssessed studen	ts: 60				
A	В	С	D	Е	FX	
76.67 10.0 8.33 0.0 3.33 1.67						
Provides:						

Date of last modification: 20.11.2021

University: P. J. Šaf	ărik University in Košice
Faculty: Faculty of	Science
Course ID: ÚINF/ TYS1/15	Course name: Typographical systems
Course type, scope Course type: Pract Recommended cou Per week: 2 Per st Course method: pr	and the method: ice urse-load (hours): udy period: 28 resent
Number of ECTS c	redits: 2
Recommended sem	ester/trimester of the course: 6., 8.
Course level: I., N	
Prerequisities:	
Conditions for cour Satisfiable ability to	se completion: correct mainly mathematical typesetting.
Learning outcomes To provide the ba mathematical formu	: asic information on principles for typesetting of documents containing llas.
 Principles for typ Typesetting of a p TeX macros. Enumerations in the pages. Typesetting of ma Making tables and Definitions, theor Contents, bibliog Pictures. 1012. Project. 	esetting of documents containing mathematical formulas. Dain text, special text symbols, using of text fonts.3 text and footnote command. Parameter setting determining the appearance of athematical 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. L. Pybièke, LaTe	 'ature: TeXbook, Computers and Typesetting, Addison-Wesley, Reading, 5. úvod do TeXu, CSTUG, 1990; èeský preklad z "A Gentle Introduction to rístupný v CTAN archíve). TeX za 59 minút, (verzia 1.0), Praha, 1989. MS-TeX (verzia 2.0), Bratislava, 1992. oy of TeX, Amer. Math. Soc., 1986. eX: A Document Preparation System, Addison-Wesley, Massachusetts, 1986. eIndex: An index processor for LaTeX, 17 February 1987.

9. H. Partl, E. Schlegl, I. Hyna, P. Sýkora, LaTeX – Stručný popis.

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:	Notes:							
Course assessment Total number of assessed students: 251								
А	В	B C D E FX						
48.21	17.93	19.92	6.37	6.77	0.8			
Provides: prof. RNDr. Stanislav Krajči, PhD.								
Date of last modification: 08.01.2022								
Approved:								
COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice				
Faculty: Faculty of Science				
Course ID: ÚINF/ WBdi/15	Course name: Web and a development of user environment			
Course type, scope a Course type: Practi Recommended cou Per week: 3 Per stu Course method: pro-	and the method: ce rse-load (hours): ady period: 42 esent			
Number of ECTS credits: 3				
Recommended semester/trimester of the course: 2.				
Course level: I.				
Prerequisities:				
Conditions for course completion: 50% of the mark for continuous assignments and discussion contributions				
Learning outcomes: Create accessible and Apply the rules for the Maintain website and	d usable Web Sites, used the standards (X) HTML and CSS. he page layout. d use the basic procedures for their promotion.			
 Brief outline of the course: 1 Introduction, specifics of distance learning, orientation in LMS Moodle. 2 (X)HTML - markup language for describing the structure and content of HTML documents. 3 (X)HTML - markup language for describing the structure and content of HTML documents. 4 (X)HTML - markup language for describing the structure and content of HTML documents. 5 CSS - a markup language for describing how (X)HTML documents are displayed. 6 CSS - a markup language for describing how (X)HTML documents are displayed. 7 Page layout - the layout of the content of a web page. 8 Page layout - the layout of the content of a web page. 9 Web page accessibility. 10 Web page accessibility. 11 Usability of web pages. 12 Usability of web pages. 				
Recommended liter: Basic sources for dis TITTEL, Ed a Jeff N 392 pFor dummie LAGRONE, Benjam Birmingham [u.a.]: H CONNOR, Joshue C Distributed to the bo ISBN 978-1-4302-41 KRUG, Steve. Nenu použitelnost webu. V	 ature: tance courses will be published in LMS Moodle. OBLE. HTML, XHTML & CSS. 7th ed. Hoboken, NJ: Wiley, c2011, xx, s. ISBN 04-709-1659-1. in. HTML5 and CSS3 responsive Web design cookbook. 1. publ. Packt Publishing, 2013. ISBN 978-184-9695-442. Pro HTML5 accessibility: building an inclusive web. New York: ok trade worldwide by Springer Science Business Media, c2012, xix, 365 p. 195-9. t'te uživatele přemýšlet!: praktický průvodce testováním a opravou chyb Yyd. 1. Brno: Computer Press, 2010, 165 s. ISBN 978-80-251-2923-4. 			

LEAVITT, Michael O. a Ben SHNEIDERMAN. Research-Based Web Design & Usability Guidelines. Washington, D.C.: U.S. General Services Administration, 2006, xxii, 267 p. ISBN 0-16-076270-7. Dostupné z: https://www.usability.gov/sites/default/files/documents/ guidelines_book.pdf

Vyhláška Úradu podpredsedu vlády Slovenskej republiky pre investície a informatizáciu zo 16. marca 2020 o štandardoch pre informačné technológie verejnej správy. In: . Bratislava: Ministerstvo spravodlivosti Slovenskej republiky, 2020, ročník 2020, číslo 78. Dostupné z: https://www.slov-lex.sk/static/pdf/2020/78/ZZ 2020 78 20210623.pdf

Course language:

Slovak language, knowledge of English is required only for reading documentation and web standards.

Notes:

Teaching is realized only by distance learning.

Course assessment

Total number of assessed students: 65

abs	n	neabs	Z
69.23	29.23	1.54	0.0

Provides: PaedDr. Ján Guniš, PhD.

Date of last modification: 10.02.2022

Approved: