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## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/AOS1/15	<b>Course name:</b> Administration of OS
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1., 3.	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b> To be able to install Linux based system, divide disks, to know how to install, configure and manage several network deamons.	
<b>Brief outline of the course:</b> 1. Introduction to network services 2. SSH 3. Routing and NAT 4. Introduction to Firewall 5. Advanced firewall settings 6. DHCP server 7. Web server (apache, php, mysql) 8. Monitoring Server (SNMP, MRTG) 9. Samba Server 10. Mail server (smtp, imap, postfix) 11. Proxy server 12. Windows server 13. Windows Server II. 14. Introduction to Virtualization (Hyper-V OpenVZ)	
<b>Recommended literature:</b> 1. Linux Documentation Project, 4 updated edition. Brno: Computer Press (2008). 2. Stanek, W.: Windows Server 2012 Inside Out. Microsoft Press (2013) 3. Shah, S. Soyinka, W. Administration Linux. Grade (2007) 4. Nemeth, E., et al.: Linux. Brno: Computer Press (2008)	
<b>Course language:</b> Slovak or english	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 28					
A	B	C	D	E	FX
57.14	21.43	14.29	0.0	7.14	0.0
<b>Provides:</b> RNDr. JUDr. Pavol Sokol, PhD., RNDr. Tomáš Bajtoš					
<b>Date of last modification:</b> 10.02.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ ADA/19		<b>Course name:</b> Applications of data analysis			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 0					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> doc. Mgr. Michal Gallay, PhD., doc. Ing. Norbert Kopčo, PhD.					
<b>Date of last modification:</b> 08.07.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ ATG/13		<b>Course name:</b> Applied graph theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Based on results of oral exam.					
<b>Learning outcomes:</b> To provide an overview of graph theory applications in computer science and other natural / social sciences.					
<b>Brief outline of the course:</b> The graph models of real-world problems. The elements of complex network analysis. Planarity testing, visualization and colouring algorithms and heuristics. Polynomial instances of NP-complete graph problems. Basics of probability method in graph theory.					
<b>Recommended literature:</b> U. Brandes, T. Erlebach: Network analysis. Methodological Foundations, Springer, 2005.					
<b>Course language:</b> Slovak or English					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 17					
A	B	C	D	E	FX
11.76	41.18	17.65	11.76	17.65	0.0
<b>Provides:</b> prof. RNDr. Tomáš Madaras, PhD.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ APA1/15		<b>Course name:</b> Approximation algorithms			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> To learn basic conceptions of randomized algorithms and to classify the algorithms due to their error probability.					
<b>Brief outline of the course:</b> Basic notions of Probability Theory. Basic randomized computing models and its characterisations. Las Vegas algorithms. One sided error Monte Carlo algorithms. Two sided bounded error Monte Carlo algorithms. Two sided unbounded error Monte Carlo algorithms. Classes of randomized algorithms with polynomial time complexity and relationships between them. Optimisation problem, approximation algorithm, relative error, approximation ratio. Special optimisation problems and approximation solutions. Classification of optimisation problems based upon their approximations. FPTAS. PTAS. TSP problem and its relaxations. Unapproximability.					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 158					
A	B	C	D	E	FX
29.11	15.82	19.62	15.82	18.99	0.63
<b>Provides:</b> prof. RNDr. Gabriel Semanišin, PhD., doc. RNDr. Ondrej Krídlo, PhD.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ PSDU/16		<b>Course name:</b> Case studies in data mining			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> Solution of practical problems in the data mining area. Orientation in basic terms of data mining. Knowledge of data mining methods.					
<b>Brief outline of the course:</b> Case study analysis using data mining methods in different application areas. Application of methods for automated analysis of large data volumes and extraction of knowledge from these data. Solving practical tasks using appropriate software tools. Testing Data Mining Algorithms.					
<b>Recommended literature:</b> [1] Zhao, Y., Cen, Y.: Data Mining Applications with R. Elsevier Inc. 2014. [2] Han, J. and Kamber, M.: Data Mining Concepts and Techniques. 3rd Edition, Morgan Kaufmann, Burlington, 2011. [3] Witten, I.E., Frank, E.: Data Mining: Practical Machine Learning Tools and Techniques, Elsevier, 2005.					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 15					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> doc. RNDr. Csaba Török, CSc., RNDr. Juraj Šebej, PhD., RNDr. Erik Bruoth, PhD.					
<b>Date of last modification:</b> 26.03.2019					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> KOP/OPaPDV/14	<b>Course name:</b> Civil Law and Intellectual Property Rights
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 3., 5.	
<b>Course level:</b> I., II., N	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 103	
abs	n
94.17	5.83
<b>Provides:</b> doc. JUDr. Renáta Bačárová, PhD., LL.M., prof. JUDr. Peter Vojčík, CSc.	
<b>Date of last modification:</b> 16.12.2020	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ KKV1/15	<b>Course name:</b> Classical and quantum computations
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Written work Written and oral examination	
<b>Learning outcomes:</b> To provide information on quantum computer and quantum computations. To compare classical and quantum models and methods.	
<b>Brief outline of the course:</b> The basics of classical theory of computation: Turing machines, Boolean circuits, parallel algorithms, probabilistic computation, NP-complete problems, and the idea of complexity of an algorithm. Introduction of general quantum formalism (pure states, density matrices, and superoperators), universal gate sets and approximation theorems. Grover's algorithm, Shor's factoring algorithm, and the Abelian hidden subgroup problem. Parallel quantum computation, a quantum analogue of NP-completeness, and quantum error-correcting codes.	
<b>Recommended literature:</b> 1. BERMAN, G.P., DOOLEN, G.D., MAINIERI, R., TSIFRINOVIC, V.I. Introduction to Quantum Computers. World Scientific, 2003. 2. GRUSKA, J. Quantum Computing. McGraw-Hill, 1999. 3. JOHNSON, G. A Shortcut Through Time: The Path to the Quantum Computer, Knopf 2003. 4. KITAEV, A.Y., SHEN, A.H., VYALYI, M.N. Classical and Quantum Computation. American Mathematical Society, 2002. 5. NIELSEN, M.A., CHUANG, I.L. Quantum Computation and Quantum Information. Cambridge University Press, 2000. 6. HIRVENSALO, M., Quantum Computing, Springer 2004	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 136					
A	B	C	D	E	FX
25.0	35.29	13.97	12.5	6.62	6.62
<b>Provides:</b> prof. RNDr. Gabriel Semanišin, PhD., RNDr. Zuzana Bednárová, PhD.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ KMU1/15		<b>Course name:</b> Coding and multimedial data transition			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 19					
A	B	C	D	E	FX
31.58	5.26	26.32	21.05	15.79	0.0
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD.					
<b>Date of last modification:</b> 07.07.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ KOA/10	<b>Course name:</b> Combinatorial algorithms
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Evaluation is based on working out the seminar work and on passing the oral examination.	
<b>Learning outcomes:</b> Mastered an ability to understand the close tie between the theoretical and algorithmic aspects of discrete mathematics and to show how algorithms can be extracted from theorems. Ability in proving algorithm correctness.	
<b>Brief outline of the course:</b> Introduction to graphs. Introduction to algorithms and complexity. Sorting algorithms. Search algorithms. Greedy algorithms. NP-completeness. Trees and rooted trees. Generating all spanning trees of a graph. Minimum spanning tree problem. Distance in graphs. Shortest path problem and its analogues. The most reliable path. The largest capacity path. The path with the largest expected capacity. Location centres and medians. Networks: An introduction to networks, the max-flow min-cut theorem. Related problems. Matchings: Maximum matchings in bipartite graphs. Maximum matchings in general graphs. Transportation and assignment problems. Eulerian graphs and Chinese postman's problem. Hamiltonian graphs. Travelling salesman problem.	
<b>Recommended literature:</b> 1. G. Chartrand, O.R. Vellermann: Applied and Algorithmic Graph Theory, McGraw-Hill, Inc. New York 1993. 2. N. Christofides: Graph Theory - An Algorithmic Approach, Academic Press, New York 1975 (Russian translation from 1978). 3. D. Jungnickel: Graphs, Networks, and Algorithms, Springer-Verlag Berlin 2005. 4. J. Plesník: Grafové algoritmy, Veda Bratislava 1983. 5. M. N. S. Swamy, K. Thulasiraman: Graphs, networks, and algorithms. John Wiley and Sons, New York 1981.	
<b>Course language:</b>	

Slovak					
<b>Notes:</b>					
<b>Course assessment</b>					
Total number of assessed students: 89					
A	B	C	D	E	FX
38.2	26.97	21.35	7.87	4.49	1.12
<b>Provides:</b> RNDr. Mária Maceková, PhD.					
<b>Date of last modification:</b> 13.02.2019					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ VKN/15	<b>Course name:</b> Computational and cognitive neuroscience II
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Midterm exam Final exam consisting of written and/or oral part	
<b>Learning outcomes:</b> Advanced topics in computational and cognitive neuroscience, and in the tools used in neuroscience.	
<b>Brief outline of the course:</b> 1. Intro: Cognitive psychology, neural modeling. Theme 1: Topics in cognitive and neural science 2. Neural basis of vision 3. Visual object recognition and visual scene analysis 4. Auditory cognition. Echo suppression. Auditory scene analysis 5. Cortical sound processing. 6. Other topics in the study of brain and main: thinking, consciousness, emotions, motivation Topic 2: Modeling in cognitive and neural science 7. Intro 8. Connectionism, STM and LTM modeling 9. Additive and shunting neural networks. 10. Learning rule Outstar. 11. Adaptive resonance theory. 12. Statistical and decision-theory modeling Topic 3: Current research at UPJS 13. Invited lecture	
<b>Recommended literature:</b> 1. KANDEL, E. R., SCHWARTZ, J. H. and JESSELL, T.M.: Principles of Neural Science. McGraw-Hill, 2021 ISBN-13: 978-1259642234 2. Dayan P and LF Abbott: Theoretical Neuroscience - Computational and Mathematical Modeling of Neural Systems. MIT Press, 2005 ISBN-13: 978-0262541855 3. Thagard P: Mind: Introduction to Cognitive Science, 2nd Edition. Bradford Books. ISBN-13 : 978-0262701099	

4. HERTZ, J., KROGH, A. and PALMER R. G.: Introduction to the theory of neural computation. Addison-Wesley 1991 ISBN-13: 978-0201515602					
<b>Course language:</b> Slovak or English					
<b>Notes:</b> Content prerequisites: basics of neurobiology, cognitive psychology, linear algebra and differential equations, programming, or instructor's consent					
<b>Course assessment</b> Total number of assessed students: 8					
A	B	C	D	E	FX
50.0	12.5	25.0	12.5	0.0	0.0
<b>Provides:</b> doc. Ing. Norbert Kopčo, PhD.					
<b>Date of last modification:</b> 08.07.2021					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ VYZ1/15	<b>Course name:</b> Computational complexity
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Oral examination.	
<b>Learning outcomes:</b> To give the students the theoretical background in computational complexity and theory of NP-completeness.	
<b>Brief outline of the course:</b> 1: Introduction: the notion of computational complexity, computational time, computational model, example - the problem of sorting, computational complexity as an asymptotic function 2: Basic computational models: RAM and RASP computers, the cost of an elementary step on these computers, single-tape Turing machine, multi-tape Turing machine, nondeterministic variants of these computational models, transformations among these models with respect to the time complexity 3: The classes P and NP: basic definitions, presenting (un)undirected graphs on the input, 3COL – the set of all 3-colorable graphs is in NP, 2COL - the set of all 2-colorable graphs is in P, SAT – the set of satisfiable Boolean formulas is in NP, CNF-SAT - Boolean formulas in conjunctive normal form 4: Variants of P and NP: decision problem, the problem of finding a solution, optimization problem, polynomial conversions among different variants 5: NP-completeness: reducibility in polynomial time and its transitivity, definition of the NP-completeness and its basic properties 6: NP-completeness of SAT 7: Variants of SAT: 3CNF-SAT - satisfiability of Boolean formulas in 3-conjunctive normal form, kCNF-SAT, CNF-SAT - satisfiability in k-conjunctive (conjunctive) normal form, 2CNF-SAT is in P 8: 3COL and its variants: 3COL (the problem of coloring vertices of a graph with 3 colors) in NP-complete, consequently: for each $k > 3$ , kCOL (the problem of coloring with k colors) is NP-complete as well 9: Colorability of a planar graph with three colors: presenting a planar graph on the input, the proof of NP-completeness, coloring with a larger number of colors 10: Another NP-complete problems: Exact set cover, Clique, Vertex cover	

- 11: Hamiltonian path: Hamiltonian path in a directed and in undirected graph
- 12: Subset-sum-like problems: Subset Sum - the problem of whether any subset of the integers sum to precisely a target sum, Partition - the problem of whether a given multiset of positive integers can be partitioned into two subsets with equal sums, a “more relaxed” version of Partition - achieving an approximate equality of the sums, distribution of tasks among K parallel processors
- 13: Beyond P a NP: a review of the basic complexity classes - L, NL, P, NP, PSpace, NPSpace, ExpTime, NExpTime, ..., simulation of (non)deterministic space in (non)deterministic time, conversions in opposite directions
- 14: PSpace: QBF - true quantified Boolean formulas, prenex normal form, Pspace completeness of QBF, PSpace = NPSpace

**Recommended literature:**

1. J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2007.
2. M. Sipser: Introduction to the Theory of Computation, Thomson, 2nd edition, 2006.
3. L.A.Hemaspaandra, M.Ogihara: Complexity theory companion, EATCS series, texts in computer science, Springer-Verlag, 2002.
4. S. Arora, B. Barak: Computational Complexity: A Modern Approach, Cambridge Univ. Press, 2009.
5. G.Brassard, P.Bradley: Fundamentals of algorithmics, Prentice Hall, 1996.
6. D.P.Bovet, P.Crescenzi: Introduction to the theory of complexity, Prentice Hall, 1994.
7. C. Calude and J. Hromkovič: Complexity: A Language-Theoretic Point of View, in G. Rozenberg and A. Salomaa, Handbook of Formal Languages II, Springer, 1997.

**Course language:**

Slovak or english

**Notes:**

Content prerequisites:

Basic notions from the theory of automata and formal languages.

Basic skills in programming and design of algorithms (in any programming language).

Basics knowledge in mathematical logic, set theory, and graph theory.

**Course assessment**

Total number of assessed students: 335

A	B	C	D	E	FX
57.61	15.52	11.94	7.16	7.46	0.3

**Provides:** prof. RNDr. Viliam Geffert, DrSc.

**Date of last modification:** 17.08.2021

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ VSM/10	<b>Course name:</b> Computational statistics and simulation methods
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Written tests. Final evaluation is given at the basis of partial examination, computing part, and oral exam.	
<b>Learning outcomes:</b> Getting to know modern software and computational and simulation methods in statistics.	
<b>Brief outline of the course:</b> <ul style="list-style-type: none"> <li>• Types of statistical computations, popular mathematical software</li> <li>• Some practical computational methods             <ul style="list-style-type: none"> <li>o Computing distribution and quantile functions</li> <li>o Matrix computations</li> </ul> </li> <li>• Random numbers generation             <ul style="list-style-type: none"> <li>o Uniform distribution (linear reccurent generators, bit reccurent generators, nonlinear generators)</li> <li>o General methods for other distributions</li> <li>o Special methods for other distributions</li> </ul> </li> <li>• Applications of random numbers             <ul style="list-style-type: none"> <li>o Simulations</li> <li>o Approximate evaluation of an integral</li> <li>o Bootstrap method</li> <li>o Random processes and MCMC method</li> </ul> </li> <li>• Exploratory data analysis             <ul style="list-style-type: none"> <li>o Principles of cluster analysis</li> <li>o GUHA method</li> </ul> </li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>• Olehla, Věchet, Olehla: Řešení úloh matematické statistiky ve Fortranu, Nadas, 1982</li> <li>• Olver et al.: NIST Handbook of mathematical functions, NIST and Cambridge University Press, 2010</li> <li>• Deák: Random number generators and simulation, Akadémiai kiadó, 1990</li> <li>• Fishman: Monte Carlo. Concepts, Algorithms, and Applications., Springer, 1996</li> <li>• Backhaus, Erichson, Plinke, Weiber: Multivariate Analysemethoden, 7th ed., Springer, 1994</li> <li>• Tan, Steinbach, Kumar: Introduction to Data Mining, Pearson Education Ltd., 2014</li> </ul>	

<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 47					
A	B	C	D	E	FX
17.02	21.28	25.53	8.51	23.4	4.26
<b>Provides:</b> prof. RNDr. Ivan Žežula, CSc., RNDr. Daniel Klein, PhD.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ TSS/10		<b>Course name:</b> Control theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Based on two written tests during the semester and on the oral examination.					
<b>Learning outcomes:</b> To learn the basic notions of controllable systems.					
<b>Brief outline of the course:</b> Controllable systems. Pontrjagin maximum principle. Linear systems, bang-bang controls, singular controls.. Discrete systems, dynamic programming, Bellmann's optimality principle. Practical applications of theoretical results.					
<b>Recommended literature:</b> 1. K. Macki, A. Strauss: Introduction to Optimal Control Theory, Springer, 1980. 2. G. Feichtinger, R.F. Hartl: Optimale Kontrolle ökonomischer Prozesse, Berlin, 1986.					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 76					
A	B	C	D	E	FX
22.37	26.32	22.37	15.79	13.16	0.0
<b>Provides:</b> prof. RNDr. Katarína Cechlárová, DrSc.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ SDM/19	<b>Course name:</b> Data Management Seminar I
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b>	
<b>Brief outline of the course:</b>	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 2	
abs	n
100.0	0.0
<b>Provides:</b>	
<b>Date of last modification:</b>	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ SDMb/19	<b>Course name:</b> Data Management Seminar II
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Active presentation of known and own results related to final thesis in the middle and end of semester.	
<b>Learning outcomes:</b> To become familiar with selected current knowledge from the area of data analysis, machine learning and artificial intelligence. Developing skills such as understanding and interpreting scientific text.	
<b>Brief outline of the course:</b> The seminar is aimed to individual and group work with students whose diploma thesis are related to various aspects of data management.	
<b>Recommended literature:</b> 1. CHOLLET, François. Deep learning v jazyku Python: knihovny Keras, Tensorflow. Přeložil Rudolf PECINOVSKÝ. Praha: Grada Publishing, 2019. Knihovna programátora (Grada). ISBN 978-80-247-3100-1. 2. GOODFELLOW Ian, BENGIO Yoshua a Aaron COURVILLE. Deep Learning. MIT Press, 2016. ISBN: 9780262035613. 3. Current articles from scientific journals, contributions at the scientific and professional conferences related to the topic of diploma thesis.	
<b>Course language:</b> English	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 0	
abs	n
0.0	0.0
<b>Provides:</b> prof. RNDr. Gabriel Semanišin, PhD., Mgr. Alexander Szabari, PhD.	
<b>Date of last modification:</b> 26.08.2021	

**Approved:**



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ DPO/15		<b>Course name:</b> Doctoral Thesis and its Defence			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 20					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 52					
A	B	C	D	E	FX
55.77	21.15	17.31	5.77	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ ZNA1/15		<b>Course name:</b> Foundations of knowledge systems			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> The goal is to teach students some advanced applications of logic into computer science, especially in database and knowledge systems.					
<b>Brief outline of the course:</b> Logic formulas, semantic, models and logical inference. Herbrand model, construction and usability. SLD-resolution and query, SLD trees. Logic and databases, relational databases, deductive databases. Logic and expert systems. Basic notions of Lattice Theory and Formal Concept Analysis (FCA). Basic notions of Fuzzy logic and Fuzzy extension of FCA. Optimal table decomposition, factorisation. Intercontextual structures, bonds.					
<b>Recommended literature:</b> Shawn Hedman. A first course in logic: An introduction to model theory, proof theory, computability and complexity. Oxford university press, ISBN 0–19–852980–5, 2006. Shan-Hwei Nienhuys-Cheng, Ronald de Wolf. Foundations of Inductive Logic Programming. Springer-Verlag, ISBN 3-540-62927-0, 1997. Kristian Kersting. An Inductive Logic Programming Approach to Statistical Relational Learning, IOS Press, ISBN 1-58603-674-2, 2006. Nilsson U., Maluszynski J.: Logic, Programming and Prolog, John Wiley & Sons Ltd. 1995. Bělohlávek R.: Fuzzy Relational Systems: Foundations and Principles. Kluwer, Academic/Plenum Publishers, New York, 2002. Ganter B., Wille R.: Formal Concept Analysis: Mathematical Foundations, Springer Berlin, 1999.					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 75					
A	B	C	D	E	FX
50.67	4.0	20.0	9.33	10.67	5.33

<b>Provides:</b> prof. RNDr. Stanislav Krajči, PhD., doc. RNDr. Ondrej Krídlo, PhD.
<b>Date of last modification:</b> 03.05.2015
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ THR/10		<b>Course name:</b> Game theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 1 <b>Per study period:</b> 42 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Two written exams during the semester. The final assessment is based on the written tests and oral examination.					
<b>Learning outcomes:</b> To learn the basic methods of game theory. We also require that students will be able to model situations from everyday life as simple games.					
<b>Brief outline of the course:</b> Examples of games. Extensive form of a game, value of the game. Von Neumann Morgenstern theory of utility. Matrix games and their solution. Bimatrix games. Theory of negotiations. n-person games: core, Shapley value. Economic applications of game theory. The students should have basic knowledge in probability theory and linear programming (including duality theory and simplex method).					
<b>Recommended literature:</b> 1. K. Binmore, Fun and games, D.C. Heath, 1992 2. G. Owen, Game Theory, Academic Press (existuje ruský preklad). 3. A.R. Karlin, Y. Peres, Game theory alive, American Mathematical Society, 2017 4. L.C. Thomas, Games, Theory and Applications, Wiley, New York. 5. H.S. Bierman, L. Fernandez, Game Theory with Economic Applications, Addison-Wesley, 1998.					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 76					
A	B	C	D	E	FX
15.79	22.37	23.68	19.74	17.11	1.32
<b>Provides:</b> prof. RNDr. Katarína Cechlárová, DrSc.					

<b>Date of last modification:</b> 07.04.2020
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KF/DF2p/03		<b>Course name:</b> History of Philosophy 2 (General Introduction)			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 6.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 742					
A	B	C	D	E	FX
60.78	13.88	12.67	8.63	3.37	0.67
<b>Provides:</b> Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.					
<b>Date of last modification:</b> 25.03.2020					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/IMUI/19		<b>Course name:</b> Information management and artificial intelligence methods			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> II.					
<b>Prerequisites:</b> (ÚINF/ZNA1/15 and lebo ÚINF/ZNA1/21), ÚINF/NEU1/15, ÚINF/STU1/16, ÚMV/VSM/10, ÚMV/NPR/19					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 0					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 29.03.2019					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ TIN/10		<b>Course name:</b> Information theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 1., 3.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> A student is evaluated according to an oral examination during which he/she answers two questions chosen by him/her at random, one from the group A and one from the group B (both for 50 points at maximum). Evaluation scale: A ... 90-100 p., B ... 80-89 p., C ... 70-79 p., D ... 60-69 p., E ... 50-59 p., FX ... 0-49 p.					
<b>Learning outcomes:</b> A student gets acquainted with a mathematical attempt to solve some problems of computer science.					
<b>Brief outline of the course:</b> A quantitative characteristic of an information. Entropy of a random variable. Mutual information. Inequalities involving mutual information and entropy, respectively. Typical sequence, typical set. Data compression.					
<b>Recommended literature:</b> T. M. Cover, J. A. Thomas, Elements of Information Theory, Wiley, 1991 (2nd ed. 2006) T. K. Moon, Information Theory (free online course materials), available at the address <a href="http://digitalcommons.usu.edu/ocw_ece/3/">http://digitalcommons.usu.edu/ocw_ece/3/</a>					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 41					
A	B	C	D	E	FX
58.54	4.88	12.2	4.88	19.51	0.0
<b>Provides:</b> prof. RNDr. Mirko Horňák, CSc.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/IDS18/18		<b>Course name:</b> Introduction to data science			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 2., 4.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Clustering; frequent pattern mining; linear classification and regression model: model parameters and hyper-parameters, validation, overfitting-underfitting and the bias-variance trade-off; introduction to prediction techniques (as black-box functions); data quality and pre-processing: noise, missing values, data transformation, normalization; the CRISP-DM process; recommendation techniques;					
<b>Recommended literature:</b> - Peter Flach (2012). Machine Learning: The Art and Science of Algorithms that Make Sense of Data. Cambridge University Press. - Jiawei Han, Micheline Kamber, Jian Pei (2011). Data Mining: Concepts and Techniques. Morgan Kaufmann. - Pang-Ning Tan, Michael Steinbach, Vipin Kumar (2005). Introduction to Data Mining. Addison Wesley. - João Moreira, Andre de Carvalho, Tomáš Horváth (2018). A General Introduction to Data Analytics. Wiley.					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 0					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Tomáš Horváth, PhD.					
<b>Date of last modification:</b> 14.09.2018					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ LTM/10		<b>Course name:</b> Logic and set theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b> ÚMV/MANb/19 and leboÚMV/FRPb/19					
<b>Conditions for course completion:</b> Exam					
<b>Learning outcomes:</b> To obtain a basic knowledge on the mathematical notion of an infinity. Analysis of the notion of a proof.					
<b>Brief outline of the course:</b> Set as a mathematical formularization of an infinity. Properties of the set of reals. Mathematical induction. Relations and mappings. Finite and countable sets. Cardinality of continuum. Elementary cardinal arithmetics. Sentential calculus, an axiomatization. Completeness Theorem. Methods of proofs. Language of predicate calculus, examples. Axiomatizations of predicate calculus and the notion of a proof. Methods of proofs in predicate calculus.					
<b>Recommended literature:</b> E. Mendelson, Introduction to Mathematical Logic, van Nostrand 1964.					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 226					
A	B	C	D	E	FX
10.62	18.14	20.35	15.93	32.74	2.21
<b>Provides:</b> doc. RNDr. Jaroslav Ivančo, CSc., Mgr. Adam Marton					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ STU1/16	<b>Course name:</b> Machine learning
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> The realization of a project focused on the application of machine solution methods in solving practical tasks. Successful completion of two written tests. Successful completion of the written and oral part of the exam.	
<b>Learning outcomes:</b> The result of education is an understanding of the basic principles of machine learning. The student will gain the ability to analyze data using selected methods of machine learning and artificial intelligence. Can work with a selected tool for modeling neural networks.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Learning algorithms, concepts, hypotheses. Training and learning, learning by construction and numbering.</li> <li>2. Boolean formulas and their representation. Learning algorithms for monocells. Hypothesis space representation.</li> <li>3. Probabilistic learning. An estimate of the number of examples needed to achieve some accuracy and credibility.</li> <li>4. Probabilistic learning and consistent algorithms.</li> <li>5. Relationships between attribute sets and predicted variables. Regression. Linear modeling using the least squares method of deviations.</li> <li>6. Linear modeling, generalization, nonlinear responses from a linear model, data validation. Classification.</li> <li>7. Linear modeling using probability theory and maximum confidence.</li> <li>8. VC (Vapnik - Cervonenkis) dimension of its relation to perceptrons.</li> <li>9. Bayesian approach to learning. SVM.</li> <li>10. Clustering.</li> <li>11. Hidden Markov models.</li> </ol>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. ANTHONY, Martin a Norman BIGGS. Computational Learning Theory, Cambridge University Press, 1997. ISBN 978-0521599221.</li> <li>2. BROWNLEE, Jason. Machine Learning Mastery With Python. 2019.</li> </ol>	

3. WATT, Jeremy, Reza BORHANI a Aggelos K. KATSAGGELOS. Machine learning refined: foundations, algorithms, and applications. Cambridge: Cambridge University Press, 2016. ISBN 978-1-107-12352-6.

**Course language:**

**Notes:**

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

**Course assessment**

Total number of assessed students: 41

A	B	C	D	E	FX
34.15	14.63	29.27	12.2	9.76	0.0

**Provides:** RNDr. Ľubomír Antoni, PhD., doc. RNDr. Gabriela Andrejková, CSc., Mgr. Zoltán Szoplák, RNDr. Šimon Horvát

**Date of last modification:** 26.08.2021

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ MPA/19	<b>Course name:</b> Markov's processes and their applications
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> To obtain at least 50% in written tests during the semester. Total evaluation based on written tests and oral exam.	
<b>Learning outcomes:</b> Student should obtain the knowledge about modelling of stochastic processes and the ability to apply theoretical knowledge in practical problems solving.	
<b>Brief outline of the course:</b> Stochastic (random) processes, their distributions and characteristics. Trajectory of the process. Classification of processes -homogenous,ergodic and stacionary process. Markov chains with discrete time, classification of states of the process. Evaluation of transitions, optimal strategies, Howard's algorithm. Markov chains with continuous time, intensity of transition. Kolmogorov's differential equations, methods of solutions. Poisson process. Birth-and-death processes. General linear process. Applications in queuing theory. Kendall's classification of queuing systems, opened and closed systems, systems with waiting. Applications in renewal theory and reliability. Markov chains in discrete renewal models. Renewal process with continuous time. Limit theorems of renewal theory.	
<b>Recommended literature:</b> 1. Skřivánková V.: Náhodné procesy a ich aplikácie, UPJŠ, Košice, 2004 (in Slovak) 2. Beichelt F.: Applied Probability and Stochastic Processes, 2nd Ed., Chapman and Hall, 2016 3. Ross S. M.: Introduction to Probability Models, 10th ed., Academic Press, 2009 4. Janková, K. a kol. Markovove reťazce a ich aplikácie, epos, 2014 (in Slovak) 5. Prášková Z., Lachout P.: Základy náhodných procesu, MFF UK, Praha, 1998 (in Czech)	
<b>Course language:</b> Slovak	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 60					
A	B	C	D	E	FX
18.33	13.33	21.67	25.0	18.33	3.33
<b>Provides:</b> RNDr. Martina Hančová, PhD., RNDr. Andrej Gajdoš, PhD.					
<b>Date of last modification:</b> 18.03.2019					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ TMT/10		<b>Course name:</b> Matroid theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 1., 3.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> A student is evaluated according to an oral examination during which he/she answers two questions chosen by him/her at random, one from the group A (65 points at maximum) and one from the group B (35 points at maximum). Evaluation scale: A ... 90-100 p., B ... 80-89 p., C ... 70-79 p., D ... 60-69 p., E ... 50-59 p., FX ... 0-49 p.					
<b>Learning outcomes:</b> A student gets acquainted with basic notions of matroid theory and possibilities of using matroids in various disciplines of discrete mathematics.					
<b>Brief outline of the course:</b> Independent sets and bases. Properties of rank function. Closure operator. Circuits. Duality in matroids. Hyperplanes.					
<b>Recommended literature:</b> D. J. A. Welsh: Matroid Theory, Academic Press, 1976 J. Oxley, Matroid Theory, Oxford University Press, 2010					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 21					
A	B	C	D	E	FX
19.05	14.29	28.57	14.29	9.52	14.29
<b>Provides:</b> prof. RNDr. Mirko Horňák, CSc.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ MPJ1/15	<b>Course name:</b> Modern programming languages
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 1 / 2 <b>Per study period:</b> 14 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 4	
<b>Recommended semester/trimester of the course:</b> 2., 4.	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b> ÚINF/PAZ1b/15	
<b>Conditions for course completion:</b> Written works during the semester, project. Written and oral exam.	
<b>Learning outcomes:</b> The aim of the course is to provide an overview of programming models and techniques for effective and accelerating the creation and reuse of code using C#.	
<b>Brief outline of the course:</b> 1) Common type system, boxing, Common Intermediate Language (CIL), Common Language Runtime (CLR) - .NET Framework. 2) Imperative and procedural programming. OOP, libraries, classes, assembly, reflection and Module. 3) Generic programming - parametric polymorphism. 4) Functional programming - lambda expressions. 5) LINQ and querying data structures. 6) Event programming - delegates. 7) Communication between windows. Design of new controls. 8) Graphic primitives and Chart. 9) Database applications, ADO.NET, Entity Framework. 10) Vector programming - operator overloading, indexer. 11) MS Office programming using C#. 12) .NET Core. Tuple vs record.	
<b>Recommended literature:</b> 1. J. Glynn, Cs. Török et al, Professional Windows GUI Programming Using C#, 2002, Wrox, ISBN-10: 1861007663 2. A. Troelsen, Ph. Japikse, Pro C# 9 with .NET 5 : Foundational Principles and Practices in Programming, 2021, 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	



<b>Course language:</b> Slovak or English.					
<b>Notes:</b> If necessary, teaching, mid-term and final evaluation will be by distance form.					
<b>Course assessment</b> Total number of assessed students: 146					
A	B	C	D	E	FX
16.44	19.86	23.97	20.55	17.81	1.37
<b>Provides:</b> doc. RNDr. Csaba Török, CSc.					
<b>Date of last modification:</b> 02.07.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ MWT1/19		<b>Course name:</b> Modern web technologies			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Active attendance at seminars, defense of final group project. The final project is partially created on seminars.					
<b>Learning outcomes:</b> Ability to design and create dynamic scalable SPA - Single Page Application using Angular and Spring Boot.					
<b>Brief outline of the course:</b> - Selected part of Javascript and Typescript, High order functions, composition of pure functions, Angular - components, services, Observable, router, localStorage, form validation, communication in component hierarchy, modules, hierarchical routing, routing guards, RXJS, material components library, NGXS storage and its extensions, reactive forms, custom validators, asynchronous validators, pagination, filtering and sorting of local and remote data in tables, Websockets.					
<b>Recommended literature:</b> 1. web page of framework Angular: <a href="https://angular.io/">https://angular.io/</a> 2. web page of Angular Material: <a href="https://material.angular.io/">https://material.angular.io/</a> 3. web page of storage NGXS: <a href="https://www.ngxs.io/">https://www.ngxs.io/</a> 4. web page of library RXJS: <a href="https://rxjs-dev.firebaseapp.com/guide/overview">https://rxjs-dev.firebaseapp.com/guide/overview</a> 5. Craig Walls: Spring in action. Fifth edition. ISBN: 978-1-61729-494-5. Hanning 2019					
<b>Course language:</b> slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 20					
A	B	C	D	E	FX
65.0	0.0	10.0	20.0	5.0	0.0
<b>Provides:</b> RNDr. Peter Gurský, PhD.					
<b>Date of last modification:</b> 09.07.2021					

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/VRS/14		<b>Course name:</b> Multidimensional statistical methods			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 <b>Per study period:</b> 42 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> Given at the basis of partial examination and working out an individual project.					
<b>Learning outcomes:</b> To learn to use the most widely used multivariate methods of data processing practically.					
<b>Brief outline of the course:</b> Multivariate data, multivariate normal distribution. Different dependence measures. Contingency tables, odds and risk ratios. Logistic regression. Classification trees, cluster analysis, principal component analysis, multidimensional scaling, factor analysis, linear discriminant analysis.					
<b>Recommended literature:</b> 1. Wolfgang Karl Härdle, Léopold Simar. Heidelberg: Applied multivariate statistical analysis, Springer, 2012 2. Wolfgang Härdle, Zdeněk Hlávka: Multivariate statistics: Exercises and solutions. New York: Springer, 2007 3. Ho, R.: Handbook of univariate and multivariate data analysis and interpretation in SPSS, Chapman & Hall/CRC, 2006 4. Garson, D.: PA 765 Statnotes: An Online Textbook (elektronická učebnica, <a href="http://www2.chass.ncsu.edu/garson/pa765/statnote.htm">http://www2.chass.ncsu.edu/garson/pa765/statnote.htm</a> ), North Carolina State University, 1998					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 1					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b> RNDr. Daniel Klein, PhD.					
<b>Date of last modification:</b> 26.03.2019					

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ NEU1/15	<b>Course name:</b> Neural networks
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 5	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Successful realization of a project focused on the applications of neural networks. Passing two tests to 60%. Demonstration of knowledge focused on the application of neural networks in the exam.	
<b>Learning outcomes:</b> Knowledge of basic paradigms of neural networks. Knowledge about applications of neural networks in various fields. Ability to assess the applicability of neural networks in solving algorithmic problems.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Motivational examples. Mathematical model of neuron and neural network. Perceptrons. Linear separable objects, adaptation process (learning), perceptron convergence, multiple perceptrons.</li> <li>2. Computational power of single input neural networks, neuromata. Simulation of automata using neural networks.</li> <li>3. Classical layer neural networks, hidden neurons, adaptation process (learning), feedback method backpropagation and its variants.</li> <li>4. Recurrent neural networks, algorithm for training recurrent networks. Examples of use.</li> <li>5. Self-organization of neural networks and Kohonen neural networks, learning algorithm, use.</li> <li>6. Networks with local neurons, RBF networks, networks with semi - local units. RBF approximations networks.</li> <li>7. Written test I.</li> <li>8. Convolutional neural networks. Basic knowledge of convolution.</li> <li>9. Convolutional neural networks for image processing.</li> <li>10. Deep neural networks and their use.</li> <li>11. Deductive systems of fuzzy logic. Fuzzy neural networks and their use. Fuzzy controller.</li> <li>12. Universal approximation using neural networks, Kolmogorov theorem. Approximation properties layered neural networks.</li> <li>13. Solving practical problems using neural networks.</li> <li>14. Written test II.</li> </ol>	
<b>Recommended literature:</b>	

1. GOODFELLOW Ian, BENGIO Yoshua a Aaron COURVILLE. Deep Learning. MIT Press, 2016. ISBN: 9780262035613. 2. HERTZ, John, Anders KROGH a Richard G. PALMER. Introduction to the theory of neural computation. Redwood City: CRC Press, [1991]. Santa Fe Institute studies in the sciences of complexity. ISBN 0-201-51560-1. 3. KVASNIČKA, Vladimír. Úvod do teórie neurónových sietí. [Slovenská republika]: IRIS, 1997. ISBN 80-88778-30-1. 4. ŠÍMA, Jiří a Roman NERUDA. Teoretické otázky neuronových sítí. Praha: MATFYZPRESS, 1996. ISBN 80-85863-18-9.					
<b>Course language:</b> Slovak or English					
<b>Notes:</b> For ERASMUS students: It is necessary to know a model of artificial neurons, its computation and its setting, layered neural networks and backpropagation training algorithm.					
<b>Course assessment</b> Total number of assessed students: 228					
A	B	C	D	E	FX
19.3	14.04	23.68	20.18	17.98	4.82
<b>Provides:</b> RNDr. Ľubomír Antoni, PhD., doc. RNDr. Gabriela Andrejková, CSc.					
<b>Date of last modification:</b> 26.08.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ PDB1/15		<b>Course name:</b> Organization and data processing			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> final test					
<b>Learning outcomes:</b> To understand the principles of database management systems. To be able to use the knowledge when solving optimization problems over big data and managing parallel and distributed databases.					
<b>Brief outline of the course:</b> Data representation, disk and file organization, tree-based indexing methods B+tree, R-tree, Hash-based indexing methods, external sorting, enumeration of relational operators, query optimization, transaction management, parallel and distributed databases, parallel and distributed relational operations, database security and data consistency, recovery management, profiling, data reduction					
<b>Recommended literature:</b> 1. R. RAMAKRISHNAN, J. GEHRKE: Database Management Systems, McGraw Hill Higher Education, 2003 2. A. SILBERSCHATZ, H. F. KORTH, S. SUDARSHAN: Database system concepts, McGraw Hill Higher Education, 2006					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 111					
A	B	C	D	E	FX
28.83	21.62	15.32	11.71	21.62	0.9
<b>Provides:</b> doc. RNDr. Csaba Török, CSc., RNDr. Peter Gurský, PhD.					
<b>Date of last modification:</b> 09.07.2021					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ PDS1/18		<b>Course name:</b> Parallel and distributed systems			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 1 <b>Per study period:</b> 28 / 14 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> to introduce the fundamentals of parallel and distributed programming					
<b>Brief outline of the course:</b> current parallel and distributed architectures, basic issues in parallel and distributed applications development, data structures and programming methodologies					
<b>Recommended literature:</b> 1. Kenneth A. Berman and Jerome L. Paul: Algorithms: Sequential, Parallel, and Distributed, Thomson, 2005, ISBN 0-534-42057-5 2. Gregory R. Andrews: Foundations of Multithreaded, Parallel, and Distributed Programming, Addison-Wesley, 2000, ISBN 0-201-35752-6 3. Joseph JáJá: An Introduction to Parallel Algorithms, Addison-Wesley, 1992, ISBN 0-201-54856-9 4. Gerard Tel: Introduction to Distributed Algorithms, Cambridge University Press, 1994, ISBN 0-521-47069-2					
<b>Course language:</b> Slovak or english					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 73					
A	B	C	D	E	FX
24.66	8.22	16.44	13.7	24.66	12.33
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD.					
<b>Date of last modification:</b> 10.02.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ PDSI1/15	<b>Course name:</b> Pro-seminar to diploma thesis in informatics
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b> To inform students about areas of informatics they are suitable to work in diploma theses. In the end of semester students have to prepared themes of diploma theses, goals and recommended study literature.	
<b>Brief outline of the course:</b> The seminar is oriented to problems prospective to preparations of Diploma theses.	
<b>Recommended literature:</b> MEŠKO, D., KATUŠČÁK, D. Akademická príručka. 1. vyd. Vydavateľstvo Osveta : Martin, 2004. 316 s. ISBN 80-8063-150-6 ISO 690: 1987 Documentation - Bibliographic references. Content, form and structure. ISO 2145: 1978 Documentation - Numbering of divisions and subdivisions in written documents. Eco, U.: Jak napsat diplomovou práci, z taliančiny Come si fa una tesi di laures, Milano, 1977, Olomouc, Votobíax. Odborná a vedecká literatúra týkajúca sa diplomovej práce podľa odporúčania vedúceho diplomovej práce.	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 72	
abs	n
97.22	2.78
<b>Provides:</b> doc. RNDr. Ľubomír Šnajder, PhD.	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> KPPaPZ/Ps/15		<b>Course name:</b> Psychology			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 2					
<b>Recommended semester/trimester of the course:</b> 1.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 517					
A	B	C	D	E	FX
22.82	16.05	21.66	18.57	17.99	2.9
<b>Provides:</b> PhDr. Anna Janovská, PhD., Mgr. Ondrej Kalina, PhD.					
<b>Date of last modification:</b> 28.06.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ THO/10		<b>Course name:</b> Queueing theory			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture <b>Recommended course-load (hours):</b> <b>Per week:</b> 4 <b>Per study period:</b> 56 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 6					
<b>Recommended semester/trimester of the course:</b> 1., 3.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b> A student is evaluated according to an oral examination during which he/she answers two questions chosen by him/her at random, one from the group A (60 points at maximum) and one from the group B (40 points at maximum). Evaluation scale: A ... 90-100 p., B ... 80-89 p., C ... 70-79 p., D ... 60-69 p., E ... 50-59 p., FX ... 0-49 p.					
<b>Learning outcomes:</b> A student gets acquainted with analysis of input requests streams and with functioning of simple queueing systems.					
<b>Brief outline of the course:</b> Queueing system. Stationary, ordinary and Markov (memoryless) input requests stream. Basic types of input requests streams. Auxiliary lemmas. Properties of a memoryless input requests stream. Service analysis in a simple queueing system. Markov's theorem.					
<b>Recommended literature:</b> B.V. Gnedenko and I.N. Kovalenko, Introduction to Queueing Theory, Second Edition, Birkhauser Boston, Cambridge MA, 1989					
<b>Course language:</b> Slovak					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 28					
A	B	C	D	E	FX
21.43	25.0	10.71	17.86	17.86	7.14
<b>Provides:</b> prof. RNDr. Mirko Horňák, CSc.					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ ÚTVŠ/CM/13	<b>Course name:</b> Seaside Aerobic Exercise
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> combined, present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance	
<b>Learning outcomes:</b> Learning outcomes: Students will be provided an overview of possibilities how to spend leisure time in seaside conditions actively and their skills in work and communication with clients will be improved. Students will acquire practical experience in organising the cultural and art-oriented events, with the aim to improve the stay and to create positive experiences for visitors.	
<b>Brief outline of the course:</b> Brief outline of the course: 1. Basics of seaside aerobics 2. Morning exercises 3. Pilates and its application in seaside conditions 4. Exercises for the spine 5. Yoga basics 6. Sport as a part of leisure time 7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly) 8. Application of seaside cultural and art-oriented activities in leisure time	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 41	
abs	n
12.2	87.8

<b>Provides:</b> Mgr. Agata Horbacz, PhD.
<b>Date of last modification:</b> 15.03.2019
<b>Approved:</b>

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ BPD1/15		<b>Course name:</b> Security of computer systems and data			
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 / 2 <b>Per study period:</b> 28 / 28 <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 5					
<b>Recommended semester/trimester of the course:</b> 3.					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 36					
A	B	C	D	E	FX
22.22	22.22	16.67	16.67	22.22	0.0
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD., RNDr. Rastislav Krivoš-Belluš, PhD.					
<b>Date of last modification:</b> 07.07.2021					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ SGV1/16		<b>Course name:</b> Seminar on computer graphics and vision			
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: 2 Per study period: 28</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 3					
<b>Recommended semester/trimester of the course:</b> 2.					
<b>Course level:</b> II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b> Seminar is connecte to the lecture UGR Introduction to computer graphics. In seminar form students presents actual theoretical and implementation problems. Main goal in interest is oriented to quick algorithms of computer graphics, geometric modelling and realistic drawing of scenes. Knowledge from the lecture UGR and good programmers experience are supposed.					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 45					
A	B	C	D	E	FX
68.89	17.78	11.11	2.22	0.0	0.0
<b>Provides:</b> RNDr. Rastislav Krivoš-Belluš, PhD., doc. RNDr. Jozef Jirásek, PhD.					
<b>Date of last modification:</b> 02.03.2016					
<b>Approved:</b>					



## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ SDI1a/15	<b>Course name:</b> Seminar to diploma theses in informatics
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b> ÚINF/PDSI1/15	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b> Monitoring and public presentation of work done so far on thesis preparation	
<b>Brief outline of the course:</b> Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts. For both parts there will be an oral presentation and discussion.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 177	
abs	n
94.92	5.08
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD., doc. RNDr. Ondrej Krídlo, PhD.	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ SDI1b/15	<b>Course name:</b> Seminar to diploma theses in informatics
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 3.	
<b>Course level:</b> II.	
<b>Prerequisites:</b> ÚINF/SDI1a/15	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b> Monitoring and public presentation of work done so far on thesis preparation	
<b>Brief outline of the course:</b> Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts. For both parts there will be an oral presentation and discussion.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 161	
abs	n
99.38	0.62
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD., doc. RNDr. Ondrej Krídlo, PhD.	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚINF/ SDI1c/15	<b>Course name:</b> Seminar to diploma theses in informatics
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 4.	
<b>Course level:</b> II.	
<b>Prerequisites:</b> ÚINF/SDI1b/15	
<b>Conditions for course completion:</b>	
<b>Learning outcomes:</b> Monitoring and public presentation of work done so far on thesis preparation	
<b>Brief outline of the course:</b> Every thesis has a compulsory theoretical part and may also contain a software part. To gain recognition, the following is necessary: a detailed compilation of studied literature (a minimum of thirty pages) and at least twenty pages of text containing the candidate's own views of the problem area, possible research goals, own results are welcome (if the thesis is purely theoretical, this will be judged more strictly). For the SW part: a tested implementation (must conform to user requirements, help and user friendly user interface not necessary at this stage) and access to source texts. For both parts there will be an oral presentation and discussion.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	
<b>Course assessment</b> Total number of assessed students: 145	
abs	n
100.0	0.0
<b>Provides:</b> doc. RNDr. Jozef Jirásek, PhD., doc. RNDr. Ondrej Krídlo, PhD.	
<b>Date of last modification:</b> 03.05.2015	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ TVa/11	<b>Course name:</b> Sports Activities I.
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b> 1.	
<b>Course level:</b> I., I.II., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Min. 80% of active participation in classes.	
<b>Learning outcomes:</b> Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.	
<b>Brief outline of the course:</b> Brief outline of the course: Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>							
Total number of assessed students: 12859							
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
87.01	0.08	0.0	0.0	0.0	0.04	8.1	4.77
<b>Provides:</b> Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.							
<b>Date of last modification:</b> 13.05.2021							
<b>Approved:</b>							

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVb/11		<b>Course name:</b> Sports Activities II.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present							
<b>Number of ECTS credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 2.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> active participation in classes - min. 80%.							
<b>Learning outcomes:</b> Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.							
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 11675							
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
84.52	0.56	0.02	0.0	0.0	0.05	10.63	4.22

<b>Provides:</b> Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD., Bc. Richard Melichar, Mgr. Petra Tomková, PhD.
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<b>Date of last modification:</b> 13.05.2021
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<b>Approved:</b>
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## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVc/11		<b>Course name:</b> Sports Activities III.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present							
<b>Number of ECTS credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 3.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> min. 80% of active participation in classes							
<b>Learning outcomes:</b> Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.							
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 7873							
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
88.8	0.05	0.01	0.0	0.0	0.03	4.08	7.04



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

**Date of last modification:** 13.05.2021

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice							
<b>Faculty:</b> Faculty of Science							
<b>Course ID:</b> ÚTVŠ/ TVd/11		<b>Course name:</b> Sports Activities IV.					
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 2 <b>Per study period:</b> 28 <b>Course method:</b> combined, present							
<b>Number of ECTS credits:</b> 2							
<b>Recommended semester/trimester of the course:</b> 4.							
<b>Course level:</b> I., I.II., II.							
<b>Prerequisites:</b>							
<b>Conditions for course completion:</b> min. 80% of active participation in classes							
<b>Learning outcomes:</b> Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.							
<b>Brief outline of the course:</b> Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, aikido, basketball, badminton, body form, bouldering, floorball, yoga, power yoga, pilates, swimming, body-building, indoor football, S-M systems, step aerobics, table tennis, tennis, volleyball and chess. In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.							
<b>Recommended literature:</b>							
<b>Course language:</b>							
<b>Notes:</b>							
<b>Course assessment</b> Total number of assessed students: 5125							
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
83.14	0.31	0.04	0.0	0.0	0.0	7.75	8.76

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

**Date of last modification:** 13.05.2021

**Approved:**

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚMV/ NPR/19	<b>Course name:</b> Stochastic processes
<b>Course type, scope and the method:</b> <b>Course type:</b> Lecture / Practice <b>Recommended course-load (hours):</b> <b>Per week:</b> 3 / 2 <b>Per study period:</b> 42 / 28 <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 6	
<b>Recommended semester/trimester of the course:</b> 2.	
<b>Course level:</b> II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Test and individual project work. Exam	
<b>Learning outcomes:</b> To obtain knowledge of the stationary stochastic processes analysis in time domain and spectral domain. To study properties of random processes with discrete time (time series) and continuous time and their application in finance.	
<b>Brief outline of the course:</b> <ol style="list-style-type: none"> <li>1. Stationary process, linear process, causal and invertible process.</li> <li>2. Time domain analysis (autocovariance and partial autocovariance function)</li> <li>3. Frequency domain analysis (spectral density and distribution function, periodogram)</li> <li>4. Prediction of time series</li> <li>5. Random processes with continuous time (fundamental concepts)</li> <li>6. Brownian motion, Itô's process, Itô's lemma and its application</li> <li>7. The Black-Scholes formula</li> </ol>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. Brockwell P., Davis R.: Introduction to Time Series and Forecasting, 3rd ed., Springer, New York, 2016</li> <li>2. Prášková Z.: Základy náhodných procesů II, Karolinum, Praha, 2004 (in Czech)</li> <li>3. Tsay R.: Analysis of Financial Time Series, 3rd ed., Wiley Interscience, New Jersey, 2010</li> <li>4. Shumway R., Stoffer D.: Time Series Analysis and Its Applications with R Examples, 4th ed., Springer, New York, 2017</li> <li>5. Melicherčík I., Olšarová L., Úradníček V.: Kapitoly z finančnej matematiky, Epos, Bratislava, 2005 (in Slovak)</li> <li>6. Oksendal B.K.: Stochastic Differential Equations, 6th ed., Springer, 2014</li> </ol>	
<b>Course language:</b> Slovak	
<b>Notes:</b>	

<b>Course assessment</b>					
Total number of assessed students: 58					
A	B	C	D	E	FX
36.21	27.59	15.52	12.07	6.9	1.72
<b>Provides:</b> RNDr. Martina Hančová, PhD.					
<b>Date of last modification:</b> 11.03.2019					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚINF/ SVK1/15		<b>Course name:</b> Student scientific conference			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b>					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b>					
<b>Course language:</b>					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 182					
A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice					
<b>Faculty:</b> Faculty of Science					
<b>Course ID:</b> ÚMV/ SVK/10		<b>Course name:</b> Students scientific conference			
<b>Course type, scope and the method:</b> <b>Course type:</b> <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> <b>Course method:</b> present					
<b>Number of ECTS credits:</b> 4					
<b>Recommended semester/trimester of the course:</b>					
<b>Course level:</b> I., II.					
<b>Prerequisites:</b>					
<b>Conditions for course completion:</b>					
<b>Learning outcomes:</b> Individual scientific work of students. Publishing of obtained results in a written form and as a public presentation.					
<b>Brief outline of the course:</b>					
<b>Recommended literature:</b> With respect to the research problematics (article in journals, books).					
<b>Course language:</b> Slovak or English					
<b>Notes:</b>					
<b>Course assessment</b> Total number of assessed students: 101					
A	B	C	D	E	FX
99.01	0.99	0.0	0.0	0.0	0.0
<b>Provides:</b>					
<b>Date of last modification:</b> 03.05.2015					
<b>Approved:</b>					

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ LKSp/13	<b>Course name:</b> Summer Course-Rafting of TISA River
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance Final assessment: Raft control on the waterway (attended/not attended)	
<b>Learning outcomes:</b> Learning outcomes: Students have knowledge of rafts (canoe) and their control on waterway.	
<b>Brief outline of the course:</b> Brief outline of the course: 1. Assessment of difficulty of waterways 2. Safety rules for rafting 3. Setting up a crew 4. Practical skills training using an empty canoe 5. Canoe lifting and carrying 6. Putting the canoe in the water without a shore contact 7. Getting in the canoe 8. Exiting the canoe 9. Taking the canoe out of the water 10. Steering a) The pry stroke (on fast waterways) b) The draw stroke 11. Capsizing 12. Commands	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	



<b>Course assessment</b>	
Total number of assessed students: 153	
abs	n
45.75	54.25
<b>Provides:</b> Mgr. Dávid Kaško, PhD.	
<b>Date of last modification:</b> 18.03.2019	
<b>Approved:</b>	

## COURSE INFORMATION LETTER

<b>University:</b> P. J. Šafárik University in Košice	
<b>Faculty:</b> Faculty of Science	
<b>Course ID:</b> ÚTVŠ/ KP/12	<b>Course name:</b> Survival Course
<b>Course type, scope and the method:</b> <b>Course type:</b> Practice <b>Recommended course-load (hours):</b> <b>Per week: Per study period:</b> 36s <b>Course method:</b> combined, present	
<b>Number of ECTS credits:</b> 2	
<b>Recommended semester/trimester of the course:</b>	
<b>Course level:</b> I., II.	
<b>Prerequisites:</b>	
<b>Conditions for course completion:</b> Conditions for course completion: Attendance Final assessment: continuous fulfilment of all tasks within the course	
<b>Learning outcomes:</b> Learning outcomes: Students will be familiarized with principles of safe stay and movement in extreme natural conditions as they will obtain theoretical knowledge and practical skills to solve the extraordinary and demanding situations connected with survival and minimization of damage to health. The course develops team work and students will learn how to manage and face the situations that require overcoming of obstacles.	
<b>Brief outline of the course:</b> Brief outline of the course: Lectures: 1. Principles of behaviour and safety for movement and stay in unknown mountains 2. Preparation and leadership of tour 3. Objective and subjective danger in mountains 4. Principles of hygiene and prevention of damage to health in extreme conditions Exercises: 1. Movement in terrain, orientation and navigation in terrain (compasses, GPS) 2. Preparation of improvised overnight stay 3. Water treatment and food preparation.	
<b>Recommended literature:</b>	
<b>Course language:</b>	
<b>Notes:</b>	

<b>Course assessment</b>	
Total number of assessed students: 393	
abs	n
44.53	55.47
<b>Provides:</b> MUDr. Peter Dombrovský, Mgr. Ladislav Kručanica, PhD.	
<b>Date of last modification:</b> 15.03.2019	
<b>Approved:</b>	