CONTENT

1. Ancient Philosophy and Present Times....2
2. Applied linear algebra....3
3. Applied statistics....4
4. Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction)....6
5. Classical and quantum computations....7
6. Combinatorial designs....9
7. Combinatorial optimization....10
8. Communication and Cooperation....12
9. Computational complexity....13
10. Control theory....15
11. Database systems for Mathematicians....16
12. Diploma project I....18
13. Diploma project II....19
14. Diploma thesis and its defence....20
15. Functional analysis....21
16. Game theory....22
17. Geometric transformations....24
18. Graph theory....25
19. Group theory....27
20. History of Philosophy 2 (General Introduction)....28
21. Idea Humanitas 2 (General Introduction)....29
22. Information theory....30
23. Lattice theory....31
24. Markov's processes and their applications....32
25. Mathematical economics....34
26. Mathematical modelling....35
27. Mathematical statistics....36
28. Matroid theory....38
29. Molecular Biology....39
30. Polyhedral theory....41
31. Psychology and Health Psychology (Master´s Study)....43
32. Queueing theory....45
33. Seaside Aerobic Exercise....46
34. Seminar on history of mathematics....48
35. Social-Psychological Training of Coping with Critical Life Situations....50
36. Sports Activities I....51
37. Sports Activities II....53
38. Sports Activities III....55
39. Sports Activities IV....57
40. Stochastic processes....59
41. Structure and Evolution of the Universe....61
42. Students scientific conference....63
43. Summer Course-Rafting of TISA River....64
44. Survival Course....66
45. Theory of codes....68
46. Topology....69
47. Universal algebra....70

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ AFS/05	**Course name:** Ancient Philosophy and Present Times

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 31

A	B	C	D	E	FX
80.65	6.45	6.45	0.0	6.45	0.0

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 17.09.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ ALA/10	**Course name:** Applied linear algebra

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
According to tests and to the exam.

Learning outcomes:
To obtain basic knowledge on linear algebra; to be able to apply the theory in concrete excercises.

Brief outline of the course:
Matrices over Euclidean rings, canonical forms. Polynomial matrices. Similar matrices. Jordan normal form. Functions of matrices, sequences, series. Inversion of singular matrices, pseudoinverse matrices and their application.

Recommended literature:
H.E.Rose: Linear Algebra, A Pure Mathematical Approach, Birkhäuser Verlag, 2002.
D.Serre: Matrices, Theory and applications, Springer Verlag, 2002.
http://www.cs.ut.ee/~toomas_l/linalg/

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 45

A	B	C	D	E	FX
26.67	6.67	24.44	6.67	35.56	0.0

Provides: prof. RNDr. Danica Studenovská, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ APS/10	**Course name:** Applied statistics

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Given at the basis of statistical processing of real data. Final evaluation is given at the basis of partial examination, computing part, and oral part of the exam.

Learning outcomes:
Learning most frequently applied statistical methods.

Brief outline of the course:
• Matrices and linear spaces, g-inversions, projections
• Important distributions
o Normal distribution and related distributions
o Hotelling's test
• General linear model
o Probability foundations of regression and correlation
o Model with full rank
o Model with incomplete rank
o Submodels testing
• Regression analysis
o Basic models
o Assesing the quality of a model
• Analysis of variance
o One-way ANOVA, multiple comparison procedures, problem of heteroskedasticity
o Balanced factorial models (two-way ANOVA with/without interactions, three-way ANOVA, BIB design, Latin squares)
o Hierarchical models
• Analysis of covariance
• Statistical software for linear modeling

Recommended literature:
• Rao: Linear statistical inference and its applications, Wiley, 1973
• Seber: Linear regression analysis, Wiley, 1977
• Searle: Linear models, Wiley, 1997
• Sen, Srivastava: Regression analysis (Theory, Methods, and Applications), Springer, 1990

• Christensen: Plane answers to complex questions (The Theory of Linear Models), Springer, 1987

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 52

A	B	C	D	E	FX
1.92	7.69	19.23	13.46	30.77	26.92

Provides: prof. RNDr. Ivan Žežula, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ KDF/05	**Course name:** Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction)

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

A	B	C	D	E	FX
50.0	20.0	10.0	0.0	10.0	10.0

Provides: PhDr. Dušan Hruška, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ KKV1/15	**Course name:** Classical and quantum computations
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 3 / 1 **Per study period:** 42 / 14 **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Written work Writen and oral examination	
Learning outcomes: To provide information on quantum computer and quantum computations. To compare classical and quantum models and methods.	
Brief outline of the course: 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.	
Recommended literature: 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	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 136

A	B	C	D	E	FX
25.0	35.29	13.97	12.5	6.62	6.62

Provides: prof. RNDr. Gabriel Semanišin, PhD., RNDr. Zuzana Bednárová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/KDZ/10	**Course name:** Combinatorial designs

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Based on results of oral exam.

Learning outcomes:
To present the basics of theory of combinatorial designs and their applications in sciences.

Brief outline of the course:
2-designs, balanced designs. Symmetric designs, Hadamard matrices, finite projective planes. Steiner systems.

Recommended literature:
I. Anderson, I. Honkala: A short course in combinatorial designs, http://www.utu.fi/~honkala/cover.html
D.R. Stinson: Combinatorial Designs: Constructions and Analysis, Springer 2004
W.D. Wallis: Combinatorial designs, Marcel Dekker 1988

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 68

A	B	C	D	E	FX
23.53	22.06	26.47	22.06	5.88	0.0

Provides: prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ KOO/10	**Course name:** Combinatorial optimization
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 3 / 1 **Per study period:** 42 / 14 **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Evaluation is based on working out the seminar work and on passing the oral examination.	
Learning outcomes: Mastered basic knowledge of methods of modelling and controlling, and an ability to apply them on typical problems using methods of discrete mathematics.	
Brief outline of the course: 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.	
Recommended literature: 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.	
Course language: Slovak	

Notes:

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
62.96	25.93	3.7	3.7	0.0	3.7

Provides: RNDr. Mária Maceková, PhD.

Date of last modification: 13.02.2019

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/KK/07	**Course name:** Communication and Cooperation
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 281

abs	n	z
98.22	1.78	0.0

Provides: Mgr. Ondrej Kalina, PhD., Mgr. Lucia Barbierik, PhD.
Date of last modification: 24.06.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ VYZ1/15	**Course name:** Computational complexity

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Oral examination.

Learning outcomes:
To give the students the theoretical background in computational complexity and theory of NP-completeness.

Brief outline of the course:
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. Pess, 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 prerequisities:
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

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ TSS/10	**Course name:** Control theory

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Based on two written tests during the semester and on the oral examination.

Learning outcomes:
To learn the basic notions of controllable systems.

Brief outline of the course:
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.

Recommended literature:
1. K. Macki, A. Strauss: Introduction to Optimal Control Theory, Springer, 1980.
2. G. Feichtinger, R.F. Hartl: Optimale Kontrolle okonomischer Prozesse, Berlin, 1986.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 76

A	B	C	D	E	FX
22.37	26.32	22.37	15.79	13.16	0.0

Provides: prof. RNDr. Katarína Cechlárová, DrSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ DBS/15	**Course name:** Database systems for Mathematicians

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Written works during the semester, project.
Written and oral exam.

Learning outcomes:
Acquired basic and advanced concepts and techniques of relational database theory and corresponding software. Know the principles of relational databases and learn the basics of query language. Understand the formal foundations of database systems - three-valued logic, relational algebra, functional dependency and normalization. Be able to model and design DB, and the role of data warehouses.

Brief outline of the course:
1) Relational databases. Query language SQL, filtering; Stored procedures.
2) Data types, operators, numerical, string and time functions; System and user functions.
3) JOIN operations; Views. CTE.
4) AGGREGATION AND GROUP BY; Recursion and transitive closure.
5) Data and database models. Relational scheme. RDB principles. Data integrity; Transactions.
6) DB design, ER diagrams; Triggers and integrity.
7) System commands about DB and tables. Cascading deletion and update; Cursors.
8) Nested queries. ROLLUP. CASE expression; Physical organization of data.
9) Three-valued logic. Quantifiers and NOT. Set operations; B-trees and indexes.
10) Data science and knowledge acquisition using R; Functional dependencies.
11) Data warehouses. Data cube. Pivot table.
12) Relational algebra. Normalization of relational databases; The latest normal form - ETNF.

Recommended literature:
- C.J. Date, Database Design and Relational Theory, 2012, O'Reilly Media, Inc., ISBN: 978-1-449-32801-6
- J. Murach, Murach's MySQL, 3rd Edition, 2019, Mike Murach & Associates, Inc., ISBN-10: 1943872368
- R. Ramakrishnan, J. Gehrke, Database Management Systems, 2020, McGraw-Hill, ISBN13 9780071231510
- S. Krajčí: Databázové systémy, UPJŠ, 2005

- I. Ben-Gan, D. Sarka, A. Machanic, K. Farlee, T-SQL Querying, 2015, Microsoft Press, ISBN: 978-0-7356-8504-8
- I. Ben-Gan, T-SQL Fundamentals, Third Edition, 2016, Microsoft Press, ISBN: 978-1-5093-0200-0

Course language:

Notes:

Course assessment
Total number of assessed students: 710

A	B	C	D	E	FX
12.68	9.58	13.24	20.42	33.8	10.28

Provides: doc. RNDr. Csaba Török, CSc.

Date of last modification: 02.07.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ DPP1a/14	**Course name:** Diploma project I
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 1	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language: Slovak	
Notes:	
Course assessment Total number of assessed students: 113	

abs	n
99.12	0.88

Provides: doc. RNDr. Roman Soták, PhD.
Date of last modification: 03.05.2015
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ DPP1b/14	**Course name:** Diploma project II
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 1	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities: ÚMV/DPP1a/14	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language: Slovak	
Notes:	
Course assessment Total number of assessed students: 41	

abs	n
100.0	0.0

Provides: prof. RNDr. Katarína Cechlárová, DrSc.
Date of last modification: 03.05.2015
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ DPO/14	**Course name:** Diploma thesis and its defence

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

Number of ECTS credits: 20

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 47

A	B	C	D	E	FX
57.45	21.28	12.77	4.26	2.13	2.13

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ FAN/10	**Course name:** Functional analysis

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
exam

Learning outcomes:
Understanding of the basic rigorous ideas of Applied Functional Analysis.

Brief outline of the course:
Linear spaces. Algebraic base and dimension. Linear operators and functionals. Algebraic dual spaces. Linear topological space. Locally convex space. Normed space. L(p) spaces. Dual spaces of L(p) spaces. Hilbert space. Applications of Baire category theorem. Open mapping theorem. Closed graph theorem. Hahn-Banach theorem. Spectrum of linear compact operator.

Recommended literature:
A. M. Bruckner, J. B. Bruckner, B. S. Thomson: Real Analysis, Prentice Hall, 1997.

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 32

A	B	C	D	E	FX
6.25	3.13	6.25	21.88	50.0	12.5

Provides: RNDr. Jaroslav Šupina, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ THR/10	**Course name:** Game theory

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Two written exams dring the semester. The final assessment is based on the written tests and oral examination.

Learning outcomes:
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.

Brief outline of the course:
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).

Recommended literature:
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.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 76

A	B	C	D	E	FX
15.79	22.37	23.68	19.74	17.11	1.32

Provides: prof. RNDr. Katarína Cechlárová, DrSc.

Date of last modification: 07.04.2020
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ GZB/10	**Course name:** Geometric transformations

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam realized by a test.

Learning outcomes:
To obtain a deeper knowledge on projective spaces and transformation groups.

Brief outline of the course:
Projective spaces, Projective transformations, collineations. Fixed elements of a collineation. A clasification of collineations.

Recommended literature:
S. V. Duzhin, B. D. Chebotarevsky: Transformation Groups for Beginers, AMS 2004

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 27

A	B	C	D	E	FX
37.04	29.63	22.22	7.41	3.7	0.0

Provides: doc. RNDr. Jaroslav Ivančo, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ TGF/10	**Course name:** Graph theory

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Oral exam.

Learning outcomes:
Basic knowledge concerning methods how new discoveries in matematics. Deeper knowledge on selected topics in graph theory.

Brief outline of the course:
Embeddings graphs into surfaces.
Global properties of embedded graphs: Oblique graphs (Voigt and Walther´s theorem), Platonic and Archimedean solids.
Introduction into the theory of light graphs: Kotzig´s theorem, Borodin´s theorem, Fabrici and Jendroľ´s theorem, light paths.
Introduction into colourings of embedded graphs: The four colour theorem, rainbow colourings, parity colourings, and non-repetitive colourings.
Words and colourings.

Recommended literature:
1. J. Barat, J. Czap: Facial nonrepetitive verxex coloring of plane graphs, J. Graph Theory, DOI:10.1002/jgt21695.
2. J. A. Bondy, U.S R. Murty: Graph Theory, Springer 2008.
3. J. Czap, S. Jendrol', F. Kardoš, R. Soták: Facial parity edge colouring of plane pseudographs, Discrete Math. 312(2012), 2735-2740.
4. J. Czap, S. Jendroľ, M. Voigt: Parity vertex colouring of plane graphs, Discrete Math. 311(2011), 512-520.
5. G. Chartrand, L. Lesniak, P. Zhang: Graphs and digraphs, CRC Press, Boca Raton 2011.
6. F. Havet, S. Jendroľ, R. Soták, E. Škrabuľáková, Facial non-repetitive edge-coloring of plane graphs, J. Graph Theory 66(2011), 38-48.
7. S. Jendroľ, H.-J. Voss: Light subgraphs of graphs embedded in the plane - A Survey, Discrete Math. 313(2013), 406-421.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 37

A	B	C	D	E	FX
56.76	10.81	18.92	10.81	2.7	0.0

Provides: RNDr. Mária Maceková, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ TGP/10	**Course name:** Group theory

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Awarded according to written and oral examination.

Learning outcomes:
The students learn basic concepts and methods of group theory and their applications in various parts of mathematics.

Brief outline of the course:
Groups of symmetries, abstract groups. Subgroups, orders of elements, cyclic groups. Normal subgroups, factorization. Classification of finitely generated abelian groups. Sylow subgroups, p-groups. Groups in linear algebra.

Recommended literature:
S. MacLane, G. Birkhoff: Algebra, Alfa Bratislava, 1973
L. Beran: Grupy a svazy, SNTL Praha, 1974
D.A.R. Wallace: Groups, Rings and Fields, Springer 1998
J. J. Rotman: Advanced Modern Algebra, Amer. Math. Soc., Providence 2010

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 32

A	B	C	D	E	FX
34.38	21.88	15.63	18.75	9.38	0.0

Provides: doc. RNDr. Miroslav Ploščica, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ DF2p/03	**Course name:** History of Philosophy 2 (General Introduction)

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 742

A	B	C	D	E	FX
60.78	13.88	12.67	8.63	3.37	0.67

Provides: Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., doc. Mgr. Róbert Stojka, PhD.

Date of last modification: 25.03.2020

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KF/ IH2/03	**Course name:** Idea Humanitas 2 (General Introduction)

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

A	B	C	D	E	FX
90.0	10.0	0.0	0.0	0.0	0.0

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 12.02.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ TIN/10	**Course name:** Information theory

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
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.

Learning outcomes:
A student gets acquainted with a mathematical attempt to solve some problems of computer science.

Brief outline of the course:
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.

Recommended literature:
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 http://digitalcommons.usu.edu/ocw_ece/3/

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 41

A	B	C	D	E	FX
58.54	4.88	12.2	4.88	19.51	0.0

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/TZV/10	**Course name:** Lattice theory

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Awarded according to written and oral examination.

Learning outcomes:
The students learn basic concepts and methods of lattice theory and gain the ability to apply them in various parts of mathematics.

Brief outline of the course:
Ordered sets and lattices. Distributivity and modularity. Ideals and set-theoretical representation. Completeness and completions. Formal concept analysis.

Recommended literature:
G. Grätzer: General Lattice Theory (2nd edition), Birkhäuser, 1998
B. A. Davey, H. A. Priestley: Introduction to lattices and order, Cambridge University Press 1990
M. Kolibiar: Algebra a príbuzné disciplíny, Alfa Bratislava, 1991

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX
16.67	20.83	33.33	25.0	4.17	0.0

Provides: doc. RNDr. Miroslav Ploščica, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MPA/19	**Course name:** Markov's processes and their applications

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
To obtain at least 50% in written tests during the semester. Total evaluation based on written tests and oral exam.

Learning outcomes:
Student should obtain the knowledge about modelling of stochastic processes and the ability to apply theoretical knowledge in practical problems solving.

Brief outline of the course:
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.

Recommended literature:
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)

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 60

A	B	C	D	E	FX
18.33	13.33	21.67	25.0	18.33	3.33

Provides: RNDr. Martina Hančová, PhD., RNDr. Andrej Gajdoš, PhD.

Date of last modification: 18.03.2019

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MTE/18	**Course name:** Mathematical economics

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Two written exams in solving problems. Final evaluation is based on written exams and theoretical oral exam.

Learning outcomes:
To learn basic notions and methods of the modern mathematical economics.

Brief outline of the course:
The notion of exchange economy. Edgeworth box. Preferences and utility functions. Optimality in exchange economies. Existence of core. Walrasian equilibrium. Optimality and decentralization. Production economies.
Basic knowledge of convex analysis and topology is recommended. Basic knowledge in microeconomics is also invited.

Recommended literature:
1. C.D. Aliprantis, D.J. Brown, O. Burkinshaw: Existence and optimality of competitive equilibria, Springer 1989
2. W. Hildenbrand, A.P. Kirman: Equilibrium analysis, North Holland,
3. A. Takayama: Mathematical economics, Cambridge University Press, 1985

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 75

A	B	C	D	E	FX
25.33	20.0	17.33	21.33	10.67	5.33

Provides: prof. RNDr. Katarína Cechlárová, DrSc.

Date of last modification: 07.03.2018

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MSM/14	**Course name:** Mathematical modelling

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Acquiring the required number of credits in the structure defined by the study plan.

Learning outcomes:
Evaluation of student‘s competences with respect to the profile of the graduate.

Brief outline of the course:

Recommended literature:

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 12

A	B	C	D	E	FX
41.67	25.0	16.67	16.67	0.0	0.0

Provides:

Date of last modification: 25.08.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ MST/19	**Course name:** Mathematical statistics

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:
To obtain at least 50% in two written tests during the semester. Total evaluation based on written tests and oral exam.

Learning outcomes:
Student should obtain the knowledge about basic statistical methods and the ability to apply theoretical knowledge in practical problems solving.

Brief outline of the course:
Random vectors, their distributions and characteristics. Joint and marginal distributions. Correlation and regression, properties of correlation coefficient. Random sample, sampling distributions and characteristics. Some important statistics and their distributions. Point estimators and their properties. Maximum likelihood method. Interval estimates, confidence interval construction.Testing of statistical hypothesis, critical region, level of significance. Methods for searching optimal critical regions. Some important parametric and nonparametric tests.

Recommended literature:

1. Skřivánková V.: Pravdepodobnosť v príkladoch, UPJŠ, Košice, 2006 (in Slovak)
2. Skřivánková V.-Hančová M.: Štatistika v príkladoch, UPJŠ, Košice, 2005 (in Slovak)
3. CASELLA, G., BERGER, R., Statistical Inference, 2nd ed., Duxbury Press, 2002
4. DeGroot, M. H., Schervish, M. J.: Probability and Statistics, 4th ed., Pearson, Boston, 2012
5. Utts, J.M., Heckard, R.F.: Mind od Statistics, 5th ed., Thomson Brooks/Cole, 2014
6. Anděl J.: Základy matematické statistiky, MatfyzPress, Praha, 2011 (in Czech)

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 125

A	B	C	D	E	FX
20.8	21.6	15.2	21.6	13.6	7.2

Provides: RNDr. Martina Hančová, PhD.
Date of last modification: 18.03.2019
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/TMT/10	**Course name:** Matroid theory

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
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.

Learning outcomes:
A student gets acquainted with basic notions of matroid theory and possibilities of using matroids in various disciplines of discrete mathematics.

Brief outline of the course:
Independent sets and bases. Properties of rank function. Closure operator. Circuits. Duality in matroids. Hyperplanes.

Recommended literature:
D. J. A. Welsh: Matroid Theory, Academic Press, 1976
J. Oxley, Matroid Theory, Oxford University Press, 2010

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 21

A	B	C	D	E	FX
19.05	14.29	28.57	14.29	9.52	14.29

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚBEV/ MOB2/10	**Course name:** Molecular Biology

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Familiarize students with the structure, properties and functions of information macromolecules and their work, focusing primarily on the molecular mechanisms of regulation of DNA replication, gene expression and cell cycle.

Brief outline of the course:
Structure and properties of information macromolecules. Molecular structure of chromatin and mitotic and meiotic chromosomes. Dynamics of chromosomes. Replication of chromosomal and extrachromosomal DNA. Repair of DNA damage. Genome of prokaryotic and eukaryotic cells. The human genome. Mobile genetic elements. Transcription and posttranscriptional modifications and editing. Translation and posttranslational modifications. Specific protein degradation. DNA-protein interactions. Regulation of the expression of prokaryotic and eukaryotic genes. Control of the cell cycle.

Recommended literature:
E. Mišúrová:Molekulárna biológia. Učebné texty, PF UPJŠ Košice, 1999
E. Mišúrová, P. Solár: Molekulová biológia. Učebné texty, PF UPJŠ, 2007
S.Rosypal:Úvod do molekulární biologie. Grafex Blansko, Brno,1999
Alberts, D.Bray, J. Lewis a kol.: Molecular Biology of the Cell, Academic Press, London, 1994
D.P. Clark: Molecular Biology, Elsevier Academic Press, London, 2005

Course language:

Notes:

Course assessment
Total number of assessed students: 1

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

Provides: doc. RNDr. Peter Pristaš, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ POT/10	**Course name:** Polyhedral theory
Course type, scope and the method: **Course type:** Lecture **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Oral exam.	
Learning outcomes: Mastered basic knowledge from theory of convex polyhedra and polyhedral maps.	
Brief outline of the course: Classification of surfaces. Combinatorial and geometric properties of three-dimensional convex polyhedra. Graphs of polyhedra. Polyhedral maps. Euler's theorem, Steinitz' theorem. Light subgraphs. Face- and vertex- vectors. Eberhard's theorem. Groups of symmetries of polyhedra. Applications in optimization and chemistry.	
Recommended literature: 1. B. Grunbaum: Convex polytopes (2nd edition), Springer New York, 2003. 2. S. Jendrol': Light subgraphs of graphs embedded in the plane - a survey, Discrete Math. 313(2013), 406-421. 3. E. Jucovič: Konvexné mnohosteny, Veda Bratislava 1981. 4. G. Ringel, Map color theorem, Springer-Verlag 1974. 2. G.M. Ziegler: Lectures on Polytopes, Springer-Verlag, New York, 1996	
Course language: Slovak	
Notes:	

Course assessment
Total number of assessed students: 11

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

Provides: prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/PPZMg/12	**Course name:** Psychology and Health Psychology (Master´s Study)

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Conditions for the continuous assessment during the semester:
Active work (maximum 5 points, 2 absences are allowed).
Preparation, presentation and discussion on a selected topic - max. 15 points.
Written examination (maximum 30 points).
Conditions for admission to the exam: min. 25 points.
Conditions for the final assessment:
Exam: written form (max. 50 points, min. 25 points)
Conditions for successful completion of the course: participation in lessons, fulfillment of assignments and at least 66 points from the overall evaluation.
Detailed information in the electronic bulletin board of the course in AIS2. The teaching of the subject will be realized by a combined method.

Learning outcomes:
The student will understand the basic concepts and theories of health psychology, can explain salutogenic factors as well as the consequences of risk behavior related to health. He is able to apply the knowledge especially in the field of prevention of burnout syndrome and support of mental health in the work of a teacher.

Brief outline of the course:
1 Introduction to health psychology
2 Psychoimmunology
3 Personality factors and health
4 Social support as a protective factor in relation to health
5 Subjective well-being
6 Stress and stressful situations and ways to manage them
7 Burnout syndrome
8 Health-promoting behavior, mental hygiene
9 Health risk behavior
10 School as an important factor of health

Recommended literature:
Křivohlavý, J.: Psychologie zdraví. Portál, Praha 2001.

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

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 226

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

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

Date of last modification: 07.07.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ THO/10	**Course name:** Queueing theory

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
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.

Learning outcomes:
A student gets acquainted with analysis of input requests streams and with functioning of simple queuing systems.

Brief outline of the course:
Queuing 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 queuing system. Markov's theorem.

Recommended literature:
B.V. Gnedenko and I.N. Kovalenko, Introduction to Queueing Theory, Second Edition, Birkhauser Boston, Cambridge MA, 1989

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
21.43	25.0	10.71	17.86	17.86	7.14

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ÚTVŠ/CM/13	**Course name:** Seaside Aerobic Exercise

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 36s
Course method: combined, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:
Conditions for course completion:
Attendance

Learning outcomes:
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.

Brief outline of the course:
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

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 41

abs	n
12.2	87.8

Provides: Mgr. Agata Horbacz, PhD.
Date of last modification: 15.03.2019
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ SHM/10	**Course name:** Seminar on history of mathematics

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Homework, presentation on the chosen topic during the seminar.
More than 91 points - evaluation of A.
81-90 points - evaluation of B.
71-80 points - rating C.
61-70 points - evaluation of D.
51-60 points - evaluation of E.
Less than 50 points - FX evaluation.

Learning outcomes:
Students get an overview of the history of the development of certain mathematical disciplines and selected terms and about parallel between phylogenesis and ontogenesis of mathematical thinking.

Brief outline of the course:
Mathematics in Early Civilizations. Greek Mathematics. Mathematics in the Near and Far East (Arabia, China, India). Medieval European Mathematics. The Renaissance of Mathematics. The Beginning of Modern Mathematics.

Recommended literature:
Burton, D. M.: The History of Mathematics: An Introduction. McGraw−Hill, 2007.
Devlin, K.: Jazyk matematiky. Dokořán, 2002 (in czech)
Kolman, A.: Dejiny matematiky ve starověku. Academia, Praha, 1968 (in slovak)
Juškevič, A. P.: Dejiny matematiky ve středověku. Academia, Praha 1977 (in slovak)
Znám,Š. a kol.: Pohľad do dejín matematiky. Alfa, Bratislava, 1986 (in slovak)
Konforovič, A.G.: Významné matematické úlohy, SPN Praha, 1989 (in slovak)

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 112

A	B	C	D	E	FX
74.11	9.82	8.93	3.57	3.57	0.0

Provides: doc. RNDr. Ingrid Semanišinová, PhD.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/SPVKE/07	**Course name:** Social-Psychological Training of Coping with Critical Life Situations

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 126

abs	n	z
97.62	2.38	0.0

Provides: Mgr. Ondrej Kalina, PhD.

Date of last modification: 11.02.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ TVa/11	**Course name:** Sports Activities I.
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** combined, present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 1.	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion: Min. 80% of active participation in classes.	
Learning outcomes: Sports activities in all their forms prepare university students for their professional and personal life. They have a great impact on physical fitness and performance. Specialization in sports activities enables students to strengthen their relationship towards the selected sport in which they also improve.	
Brief outline of the course: Brief outline of the course: 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.	
Recommended literature:	
Course language:	
Notes:	

Course assessment
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

Provides: 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.

Date of last modification: 13.05.2021

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVb/11	**Course name:** Sports Activities II.

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., I.II., II.

Prerequisities:

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

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

Brief outline of the course:
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.

Recommended literature:

Course language:

Notes:

Course assessment
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

Provides: 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.
Date of last modification: 13.05.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVc/11	**Course name:** Sports Activities III.

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 3.

Course level: I., I.II., II.

Prerequisities:

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

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

Brief outline of the course:
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.

Recommended literature:

Course language:

Notes:

Course assessment
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

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/TVd/11	**Course name:** Sports Activities IV.

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I., I.II., II.

Prerequisities:

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

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

Brief outline of the course:
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.

Recommended literature:

Course language:

Notes:

Course assessment
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

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ NPR/19	**Course name:** Stochastic processes

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2., 4.

Course level: II.

Prerequisities:

Conditions for course completion:
Test and individual project work.
Exam

Learning outcomes:
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.

Brief outline of the course:
1. Stationary precess, linear process, causal and invertible process.
2. Time domain analysis (autocovariance and partial autocovariance function)
3. Frequency domain analysis (spectral density and distribution function, periodogram)
4. Prediction of time series
5. Random processes with continuous time (fundamental concepts)
6. Brownian motion, Itô's process, Itô's lemma and its application
7. The Black-Scholes formula

Recommended literature:
1. Brockwell P., Davis R.: Introduction to Time Series and Forecasting, 3rd ed., Springer, New York, 2016
2. Prášková Z.: Základy náhodných procesů II, Karolinum, Praha, 2004 (in Czech)
3. Tsay R.: Analysis of Financial Time Series, 3rd ed., Wiley Interscience, New Jersey, 2010
4. Shumway R., Stoffer D.: Time Series Analysis and Its Applications with R Examples, 4th ed., Springer, New York, 2017
5. Melicherčík I., Olšarová L., Úradníček V.: Kapitoly z finančnej matematiky, Epos, Bratislava, 2005 (in Slovak)
6. Oksendal B.K.: Stochastic Differential Equations, 6th ed., Springer, 2014

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 58

A	B	C	D	E	FX
36.21	27.59	15.52	12.07	6.9	1.72

Provides: RNDr. Martina Hančová, PhD.

Date of last modification: 11.03.2019

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SEV/10	**Course name:** Structure and Evolution of the Universe

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Due to Covid-19 adapted to carry out distance learning:
1. Preparation of own notes on the topics covered on the basis of provided study materials.
2. Seminar essay. Send the title of the selected topic to the lecturer no later than the end of the semester (May 15, 2020).
3. Oral exam within the curriculum of the course using electronic facilities (Skype/Hangouts)

Learning outcomes:
Become acquainted with basic knowledge about the structure and evolution of the universe.

Brief outline of the course:
The stars, their basic properties, structure and evolution. Structure and distribution of matter in the universe. Cosmological theories, formation, evolution and future of the universe.

Recommended literature:
1. Carroll, B. W., Ostlie, D. A., An Introduction to Modern Astrophysics, Addison-Wesley Publishing Company, Reading, Massachusetts, 1996;
2. Contopoulos, D. Kotsakis, Cosmology, the structure and evolution of the Universe, Springer, 1984;
3. Narlikar, J.V.,An Introduction to Cosmology, Cambridge University Press, Cambridge, 2002;
4. Pasachoff, J.M., Filippenko, A., The Cosmos: Astronomy in the New Millennium, Cambridge University Press, 2013;

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 126

A	B	C	D	E	FX
33.33	29.37	14.29	12.7	10.32	0.0

Provides: doc. RNDr. Rudolf Gális, PhD.

Date of last modification: 30.06.2021
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ SVK/10	**Course name:** Students scientific conference

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Individual scientific work of students. Publishing of obtained results in a written form and as a public presentation.

Brief outline of the course:

Recommended literature:
With respect to the research problematics (article in journals, books).

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 101

A	B	C	D	E	FX
99.01	0.99	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

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

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

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ KP/12	**Course name:** Survival Course
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 36s **Course method:** combined, present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion: Conditions for course completion: Attendance Final assessment: continuous fulfilment of all tasks within the course	
Learning outcomes: 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.	
Brief outline of the course: 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.	
Recommended literature:	
Course language:	
Notes:	

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

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/TKO/10	**Course name:** Theory of codes

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
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.

Learning outcomes:
A student gets acquainted with basic principles and theoretical bases of text coding and possibilities of their application.

Brief outline of the course:
Monoids. Basic notions of theory of codes. Examples of codes. Important classes of codes. Maximal codes. Submonoids generated by codes. Stable submonoids. Group codes. Free hull of a set of words. Test for recognising codes. Measure of a code. Bernoulli distribution. Dyck code. Complete sets in monoids. Thin codes. Composition of codes. Indecomposable codes.

Recommended literature:
J. Berstel and D. Perrin, Theory of Codes, Academic Press, 1985

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 25

A	B	C	D	E	FX
44.0	16.0	4.0	4.0	20.0	12.0

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ TOP/15	**Course name:** Topology

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Exam

Learning outcomes:
To acquaint the student with basic knowledge of point-set topology.

Brief outline of the course:
Basic notions and results of point-set topology. Connected and arcwise connected space. Compactness and compactification. Uniform space, basic properties. Metric and separable space. Dimension and its basic properties. The notion of a manifold and examples of manifolds. Homotopy, homotopy group.

Recommended literature:
R. Engelking, General Topology, Heldermann, Berlin, 1989.
J.L. Kelley, General Topology, Springer, 1955.
I.M. Singer and J.A. Thorpe, Lecture Notes on Elementary Topology and Geometry, Springer, 1967.

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 4

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

Provides: RNDr. Jaroslav Šupina, PhD.

Date of last modification: 23.09.2016

Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/UAL/10	**Course name:** Universal algebra

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:
According to results of the exam (written+oral).

Learning outcomes:
To obtain basic knowledge from universal algebra and to be able to apply it in concrete situations.

Brief outline of the course:
Algebraic structures. Homomorphisms and congruences. Direct and subdirect products. Terms. Free algebras. Birkhoff theorems about varieties.

Recommended literature:
S.Burris, H.P.Sankappanavar: A Course in Universal Algebra. Springer-Verlag, 1981.
B. Jónsson: Topics in universal algebra, Springer-Verlag 1972.
G. Grätzer: Universal Algebra, 2nd edition, Springer Verlag, 1979.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 23

A	B	C	D	E	FX
26.09	26.09	30.43	4.35	8.7	4.35

Provides: prof. RNDr. Danica Studenovská, CSc.

Date of last modification: 31.01.2019

Approved: